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MRS SYSTEM STUDY FOR THE REPOSITORY

by

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ABSTRACT

For each of nine scenarios (cases) defined by the U. S. Department of Energy, this study evaluates the repository construction and design costs, operating costs, decommissioning costs, required staffing, and construction schedules.

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QUALITY ASSURANCE LEVEL ASSIGNMENT

The engineering activities in support of this document have been performed at Quality Assurance Level III; the administrative activities do not have an associated quality assurance level. In general, engineering activities include the development of facility general arrangement drawings and waste package configurations, the planning of waste-handling operations, and all calculations associated with waste receipt, preparation, storage, and emplacement. Activities also include the development of the facility life-cycle cost estimates and construction schedules.

The work in this study was performed under Work Breakdown Structure No. 1.2.4.1.1.4, Engineering Design Support and Special Studies in response to DIM 43.

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EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management (OCRWM), has initiated a waste management system study to identify the impacts of the presence or absence of a monitored retrievable storage facility (hereinafter referred to as "MRS") on system costs and program schedules. To support this study, life-cycle cost estimates and construction schedules have been prepared for the surface and underground facilities and operations of a geologic nuclear waste repository at Yucca Mountain, Nye County, Nevada. The Yucca Mountain site was designated for characterization as a site for a nuclear waste repository in the 1987 amendment to the Nuclear Waste Policy Act.

Nine different operating scenarios (cases) have been identified by OCRWM for inclusion in this study. For each case, the following items are determined: the repository design and construction costs, operating costs, closure and decommissioning costs, required staffing, construction schedules, uncertainties associated with the costs and schedules, and shipping cask and disposal container throughputs. To develop the costs and schedules, the throughputs are used as input.

The estimates of costs and schedules are based on published repository designs. The cost estimates have been modified to address the requirements of the nine cases examined in this study. The modifications are generally minimal and may not result in optimal designs, costs, or schedules.

Table ES-1 summarizes the functions, life-cycle costs, schedules, and staffing requirements for the nine study cases.

Table ES-2 summarizes the repository design, licensing, and construction activities as developed in this study.

TABLE ES-1

SUMMARY OF FUNCTIONS, REPOSITORY LIFE-CYCLE COSTS, SCHEDULES, AND STAFFING FOR CASES 1 THROUGH 9

Case Number	MRS Function	Repository Function	No. of Containers Emplaced (a)	Repository Life-Cycle Cost ($M)	Start of Emplacement Operations	Repository Operations Staffing Requirements
1	N/A (no MRS)	Consolidate and containerize	39,086	7,450	Jan 2003	1,179
2	N/A (no MRS)	Containerize intact	44,700	7,086	Jan 2003	1,133
3	Store intact/ship	Consolidate and containerize	39,086	7,381	Jan 2003	1,163
4	Store intact/ship	Containerize intact	44,700	7,011	Jan 2003	1,118
5	Consolidate and canisterize	Containerize canisters	42,553	6,548 (b)	Jan 2003	1,095
6	Containerize	Inspect: return to MRS or emplace	44,700	5,404 (c)	Jan 2003	1,066
7	Containerize	Inspect: repair and emplace	44,700	5,427 (c)	Jan 2003	1,077
8	Consolidate and containerize	Inspect: return to MRS or emplace	38,237	5,121 (c)	Jan 2003	1,004
9	Consolidate and containerize	Inspect: repair and emplace	38,237	5,139 (c)	Jan 2003	1,013

a. Excludes containers used for performance confirmation.
b Excludes cost of MRS canisters.
c. Excludes cost of containers purchased and applied to MRS.

TABLE ES-2

REPOSITORY DESIGN, LICENSING, AND CONSTRUCTION ACTIVITIES SCHEDULE

Item	Duration (mo)	Start Date	Finish Date
Advanced Conceptual Design	27	Oct 89	Jan 92
License Application Design	30	Jan 92	Jul 94
Prepare License Application	6	Jul 94	Jan 95
Final Procurement and Construction Design	36	Jan 95	Jan 98
NRC License Review	36	Jan 95	Jan 98
Site Construction Facilities	6	Jan 98	Jul 98
Site Preparation -- Onsite	9	Feb 98	Nov 98
-- Offsite	37	Feb 98	Mar 01
Waste Handling			
Building #1 (Cases 1 and 3)[a]	39	Oct 98	Jan 02
Building #2 (Cases 1 and 3)[b]	54	Jan 99	Jul 03
Building #1 (Cases 2 and 4)[c]	48	Oct 98	Oct 02
Building #1 (Cases 5-9)[d]	43	Oct 98	May 02
Other Surface Facility	45	Mar 98	Dec 01
Underground Facility (All Cases)	60	Jan 98	Jan 03

a. Duration, including site preparation, is 48 mo.
b. Duration, including site preparation, is 66 mo.
c. Duration, including site preparation, is 57 mo.
d. Duration, including site preparation, is 52 mo.

Appendix A

CALCULATION OF CASK AND CONTAINER ANNUAL THROUGHPUT

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 01

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CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 02

Purpose:

For the Civilian Radioactive Waste Management Program, several concepts of the repository surface facilities have been identified. In addition, whether or not a Monitored Retrievable Storage (MRS) Facility is included in the program is being evaluated. To help in determining if an MRS is beneficial to the waste management program, 9 cases or scenarios are being reviewed as part of an MRS System study.

The purpose of this calculation is to calculate, (1) the maximum number of casks (by type) received annually by the repository, (2) the number of unloading ports required to unload those casks and (3) the maximum number of containers prepared annually for emplacement.

The scope of this calculation is to calculate the above information for the 9 different cases described in Reference 5 pages 1 and 4, in accordance with the assumptions listed in Section A of this calculation.

The calculation for the SCP-CDR Case is included for comparison purposes. The assumptions for this case are in Reference 1.

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 03

A. ASSUMPTIONS

			Reference
1.	Total Repository Capacity (MTU)		7 (p. 19)
	a. Spent fuel	63,020	
	b. DHLW	6340	
	c. WVHLW	640	
	Total	70,000	
2.	Maximum Annual Repository Capacity (MTU)		1 (p. 2-32)
	a. Spent fuel	3000	
	b. DHLW & WVHLW	400	
	Total	3400	
3.	MTU per Unit		2 (p. 2)
	a. PWR spent fuel assembly	0.43	
	b. BWR spent fuel assembly	0.18	
	c. DHLW canister	0.5	
4.	Consolidation of Spent Fuel (when consolidated)		3 (p. 2)
	a. Consolidated	95%	
	b. Intact fuel	5%	
5.	Spent Fuel Mix		2 (p. 2)
	a. BWR	33.3%	
	b. PWR	66.7%	

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 04

6.	Shipment of Spent Fuel to Repository		
	a. Cases 3,4,5		
	Spent fuel from western utilities	10%	2 (p. 19)
	Spent fuel from MRS	90%	
	b. Cases 1&2 - from Reactors (no MRS)	100%	
	c. Cases 6,7,8,9 - from MRS	100%	Assumed
7.	Shipment of Spent Fuel from Reactors to Repository		3 (p. 5)
	a. Rail	55%	
	b. Truck	45%	
8.	Shipment of Spent Fuel from MRS to Repository		2 (p. 5)
	a. Rail	100%	
	b. Truck	0%	
9.	Spent Fuel Assemblies per Cask from Reactor		2 (p. 6)
	BWR		
	a. Rail	48	
	b. Truck	7	
	PWR		
	a. Rail	21	
	b. Truck	3	
10.	Consolidated Spent Fuel Assemblies per Cask from MRS (rail)		4
	a. Case 5		4
	BWR	140	
	PWR	56	
	b. Cases 8&9		4
	BWR (4 Containers/cask)	72	
	PWR (4 Containers/cask)	24	

11. Intact Spent Fuel Assemblies per Cask from MRS (rail)

a. Cases 3&4 (store only at MRS) Use assemblies per rail cask from reactors (Item 9 above)		4
b. Case 5		4
BWR	61	
PWR	28	
c. Cases 6&7*		4
BWR/PWR - Hybrid (4 Containers/cask)	16/12	
BWR only (4 Containers/cask)	40	
PWR only (4 Containers/cask)	16	
d. Cases 8&9		4
BWR (4 Containers/cask)	24	
PWR (4 Containers/cask)	12	

* SNF is shipped in hybrid containers to the extent possible; the remaining assemblies are shipped in BWR or PWR only containers, as applicable

12. DHLW

a. Canisters per Cask (rail only)	5	2 (p. 7)
b. Containers per Cask (Cases 6,7,8,9)*	5	Assumed
c. Canisters per container	1	2 (p. 10)

*Containerized at MRS

13. Hardware

a. For Figure 3 Containers (Case 5):		
BWR/PWR assemblies per drum	7	2 (p. 24)
Drums per canister	5	2 (p. 7)
b. For Figure 1 Containers (Cases 1,3,8,9):		
BWR assemblies per canister	108	2 (p. 10)
c. Canisters per Cask (all consol. cases)	4	2 (p. 7)
d. Canisters per container (all consol. cases)	1	2 (p. 10)

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14. Canister Size (in.)		3 (p.2)
a. Square	9.1 x 9.1	
b. Small square	6.0 x 6.0	
c. Rectangle (1/2 squares)	None	
15. Spent Fuel Assemblies per Canister (Case 5)		1 (p. 2-32)
BWR		
a. Intact fuel	1	
b. Consolidated	5	
PWR		
a. Intact fuel	1	
b. Consolidated	2	
16. Spent Fuel Canisters per Cask (Case 5) (Assemblies/Cask ÷ Assemblies/Canister)		(Calculated)
BWR		
a. Intact fuel	61	
b. Consolidated	28	
PWR		
a. Intact fuel	28	
b. Consolidated	28	
17. Spent Fuel Assemblies per Container (Case 5)		3 (Attach. 5, Fig. 3)
BWR		
a. Intact fuel	9	
b. Consolidated	20	
PWR		
a. Intact fuel	4	
b. Consolidated	6	

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18. Spent Fuel Assemblies per Container (Cases 1,3,8,9)		3 (Attach. 5, Fig. 1)
BWR		
a. Intact fuel	6	
b. Consolidated	18	
PWR		
a. Intact fuel	3	
b. Consolidated	6	
19. Spent Fuel Assemblies per Container (Cases 2,4,6,7)		3 (Attach. 5, Fig. 2)
a. BWR/PWR	4/3	
b. BWR only	10	
c. PWR only	4	
20. Number of Waste Buildings		1 (p. 2-32)
a. Cases 1&3	2	
B. All other cases	1	
21. Casks per Train (SNF and DHLW) *Plus additional casks for hardware	5 *	1 (p. 6)

22. Assumptions Used in Calculating Repository Throughput

1. Waste receiving is controlled by cask unloading operations.

2. Operations and operational times defined in Section 2.0 of the "FY87 Waste-Handling Operations Study" SAND87-0088, Draft 1.0, dated 06/29/88 are acceptable for the purposes of this study.

3. There are 8 clock hours/shift and 6 productive hours/shift.

4. Operations may be conducted on a 1-, 2-, or 3-shift/day basis.

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5. Operations may be conducted on a 5-, 10-, 15-, or 21-shift/week basis.

6. Operations will be conducted on a 50-week/year basis.

7. Equipment availability factors assumed:

5	shifts/week	1.00
10	shifts/week	0.90
15	shifts/week	0.80
21	shifts/week	0.70

8. Cask unloading times are based on the assumption that material handling equipment is available as required.

9. The designs presented in the SCP-CDR and in the FY87 Waste-Handling Operations Study will be used as a basis in this analysis.

10. The following cask unloading times (Blocks 1.9 through 1.34 as identified in SAND87-00088) will be used as a basis for calculating the cask unloading times for each case.

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BLOCK NO.	TIME	BLOCK NO.	TIME
1.9	10	1.23	SEE BELOW
1.10	30	1.24	10
1.11	5	1.25	20
1.12	50	1.26	20
1.14	35	1.27	50
1.16	20	1.29	20
1.17	30	1.31	20
1.19	20	1.32	55
1.20	20	1.33	5
1.21	10	1.34	10
1.22	40		

TOTAL TIME W/O BLOCK NO. 1.23 = 480 MIN.

Block 1.23 Time

CASK TYPE	ASSEMBLIES PER CASK	TOTAL TIME(MIN)
BWR RAIL CASK	36	480
BWR TRUCK CASK	5	75
PWR RAIL CASK	14	190
PWR TRUCK CASK	2	35
HLW TRUCK CASK	1	25

B. CALCULATION OF UNLOADING TIME FOR EACH ASSEMBLY

Based on the above total cask unloading times, the following average unloading times for each assembly are calculated:
(average time per assembly/container= total time ÷ assemblies /container per cask)

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CASK TYPE	ASSEMBLIES PER CASK	TOTAL TIME(MIN)	AVERAGE TIME PER ASSEMBLY
BWR RAIL CASK	36	480	13.3
BWR TRUCK CASK	5	75	15
PWR RAIL CASK	14	190	13.6
PWR TRUCK CASK	2	35	17.5
HLW TRUCK CASK	1	25	25

C. CALCULATION OF TOTAL CASK UNLOADING TIME (TO REFLECT REVISED CASK CAPACITIES)

Based on the above calculated unloading times per assembly, similar average unloading times for each assembly/canister are estimated for the casks with revised capacities:

CASK TYPE	ASSEMBLIES PER CASK	CANISTERS PER CASK	MINUTES PER ASS'Y/ CANISTER	BLOCK 1.23 TIME
BWR RAIL FROM REACTORS	48	N/A	13.5	648
BWR TRUCK FROM REACTORS	7	N/A	15	105
PWR RAIL FROM REACTORS	21	N/A	13.5	284
PWR TRUCK FROM REACTORS	3	N/A	17	51
DHLW RAIL	N/A	5	15	75
BWR INTACT FROM MRS(Case 5)	61	61	13.5	824
BWR CONSOL FROM MRS(Case 5)	140	28	13.5	378
PWR INTACT FROM MRS(Case 5)	28	28	13.5	378
PWR CONSOL FROM MRS(Case 5)	56	28	13.5	378
HARDWARE	N/A	4	16	64
SNF CASKS FOR CASES 6-9	VARIES	4 CONT.	16	64

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CASK TYPE	BLOCK 1.23 TIME	TOTAL TIME W/O BLOCK 1.23	TOTAL TIME
BWR RAIL FROM REACTORS	648	480	1128
BWR TRUCK FROM REACTORS	105	480	585
PWR RAIL FROM REACTORS	284	480	764
PWR TRUCK FROM REACTORS	51	480	531
DHLW RAIL	75	480	555
BWR INTACT FROM MRS(Case 5)	824	480	1304
BWR CONSOL FROM MRS(Case 5)	378	480	858
PWR INTACT FROM MRS(Case 5)	378	480	858
PWR CONSOL FROM MRS(Case 5)	378	480	858
HARDWARE	64	480	544
SNF CASKS FOR CASES 6-9	64	480	544

D. CALCULATION OF PRODUCTIVITY TIME REQUIRED FOR DHLW

	NO. OF CASKS	TIME PER CASK	FACILITY TIME REQ'D (MIN)
DHLW RAIL	160*	555	88,800

* See p. 16

CALCULATION SHEET

CALC. NO. M-150 REV. NO. C

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E CALCULATION OF PRODUCTIVITY TIME AVAILABLE

PRODUCTIVE TIME PER SHIFT FOR ONE UNLOADING PORT

6 HOURS PER SHIFT X 60 MINUTES PER HOUR = 360 MIN.

ANNUAL PRODUCTIVE TIME PER UNLOADING PORT
= EQUIPMENT AVAILABILITY FACTOR x PRODUCTIVITY TIME PER SHIFT x SHIFTS PER WEEK x WEEKS PER YEAR

	MINUTES PER YEAR PER UNLOADING PORT
5 SHIFTS PER WEEK 360 X 5 X 50 X 1.0 =	90,000
10 SHIFTS PER WEEK 360 X 10 X 50 X .9 =	162,000
15 SHIFTS PER WEEK 360 X 15 X 50 X .8 =	216,000
21 SHIFTS PER WEEK 360 X 21 X 50 X .7 =	264,600

F. References

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SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 13

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5. DOE (Department of Energy) August 2, 1988, "MRS Systems Studies, Task A Report," Final Draft.

6. SNL (Sandia National Laboratories), June 29, 1988, "FY 87 Waste-Handling Operations Study," SAND87-0088, Draft 1.0

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CASE 1:

1.0 Description:

There is no MRS facility and the repository provides all of the packaging of spent fuel. This "No-MRS-Case" will be used as a point of comparison of all other options. The repository will be assumed to package fuel in accordance with the SCP-CDR design, "consolidation at the repository".

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 3000 x .333 = 1000 MTU
PWR = 3000 x .667 = 2000 MTU

Reactor to repository shipments are 55% rail, 45% truck.

SNF receipt by reactor type/transportation mode.

BWR/rail = 1000 x .55 = 550 MTU
BWR/truck = 1000 x .45 = 450 MTU
PWR/rail = 2000 x .55 = 1100 MTU
PWR/truck = 2000 x .45 = 900 MTU

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type/transportation mode.

BWR/rail	550 ÷ 0.18	=	3056	assemblies
BWR/truck	450 ÷ 0.18	=	2500	assemblies
PWR/rail	1100 ÷ 0.43	=	2558	assemblies
PWR/truck	900 ÷ 0.43	=	2093	assemblies

Capacity of casks used to ship SNF to repository.

a.	BWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	48
b.	BWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	7
c.	PWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	21
d.	PWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	3

Number of SNF casks received annually at the repository by reactor type and transportation mode.

BWR/rail	3056 ÷ 48	=	64	casks
BWR/truck	2500 ÷ 7	=	357	casks
PWR/rail	2558 ÷ 21	=	122	casks
PWR/truck	2093 ÷ 3	=	698	casks

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHLW CANISTERS = 400 ÷ 0.5 = 800

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RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware received at repository = 0

2.4 Containers emplaced at the repository (consolidation at the repository)

95% CONSOLIDATION, 5% INTACT

SNF Assemblies per Container (See Fig. 1):

BWR INTACT	=	6
BWR CONSOLIDATED	=	18
PWR INTACT	=	3
PWR CONSOLIDATED	=	6

Total BWR Assemblies:

3056(RAIL) + 2500(TRUCK) = 5556 ASSEMBLIES

BWR Intact SNF Containers:

= 5556 x 0.05 = 278 ASSEMBLIES

= 278 ÷ 6 = 46 CONTAINERS

BWR Consolidated SNF Containers:

= 5556 x .95 = 5278 ASSEMBLIES

= 5278 ÷ 18 = 293 CONTAINERS

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Total PWR Assemblies:

2558(RAIL) + 2093(TRUCK) = 4651 ASSEMBLIES

PWR Intact SNF Containers:

4651 x 0.05 = 233 ASSEMBLIES
233 ÷ 3 = 78 CONTAINERS

PWR Consolidated SNF Containers:

4651 x 0.95 = 4419 ASSEMBLIES
4419 ÷ 6 = 736 CONTAINERS

Hardware containers from Consolidation at Repository:

PWR* = 0
BWR = one container per 108 BWR ASSEMBLIES

* Hardware from PWRs fits into PWR consolidated containers

Hardware Containers:

5556 x 0.95 ÷ 108 = 49 CONTAINERS

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

46 + 293 + 78 + 736 + 49 + 800 = 2002 CONTAINERS

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3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK*	FACILITY TIME REQ'D
BWR RAIL	64	1128	72,192
BWR TRUCK	357	585	208,845
PWR RAIL	122	764	93,208
PWR TRUCK	698	531	370,638
		TOTAL	744,883

* See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN†
SNF 744,883(MIN)	9	5	4	3
DHLW** 88,800(MIN)	1	-	-	-

† See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

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CASE 2:

1.0 Description:

There is no MRS facility and the repository provides all of the packaging of spent fuel. The repository will be assumed to package intact spent nuclear fuel assemblies for disposal, "no consolidation".

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 3000 x .333 = 1000 MTU
PWR = 3000 x .667 = 2000 MTU

Reactor to repository shipments are 55% rail, 45% truck.

SNF receipt by reactor type/transportation mode.

BWR/rail = 1000 x .55 = 550 MTU
BWR/truck = 1000 x .45 = 450 MTU
PWR/rail = 2000 x .55 = 1100 MTU
PWR/truck = 2000 x .45 = 900 MTU

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

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SNF assembly receipt by reactor type/transportation mode.

BWR/rail	550 ÷ 0.18	=	3056	assemblies
BWR/truck	450 ÷ 0.18	=	2500	assemblies
PWR/rail	1100 ÷ 0.43	=	2558	assemblies
PWR/truck	900 ÷ 0.43	=	2093	assemblies

Capacity of casks used to ship SNF to repository.

a.	BWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	48
b.	BWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	7
c.	PWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	21
d.	PWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	3

Number of SNF casks received annually at the repository by reactor type and transportation mode.

BWR/rail	3056 ÷ 48	=	64	casks
BWR/truck	2500 ÷ 7	=	357	casks
PWR/rail	2558 ÷ 21	=	122	casks
PWR/truck	2093 ÷ 3	=	698	casks

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHLW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware received at repository = 0

2.4 Containers emplaced at the repository (no consolidation)

SNF Assemblies per Container (See Fig. 2):

BWR/PWR INTACT	=	4/3
BWR CONSOLIDATED	=	N/A
PWR INTACT	=	4
PWR CONSOLIDATED	=	N/A
BWR INTACT	=	10

Use of hybrid (BWR/PWR) containers is preferred. The number of hybrid containers is determined by the type fuel that requires the fewer number of containers.

Total BWR Assemblies:

3056(RAIL) + 2500(TRUCK) = 5556 ASSEMBLIES

BWR/PWR SNF Containers for BWR assemblies:

5556 ÷ 4 = 1389 CONTAINERS

Total PWR Assemblies:

2558(RAIL) + 2093(TRUCK) = 4651 ASSEMBLIES

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BWR/PWR SNF Containers for PWR assemblies:

4651 ÷ 3 = 1550 CONTAINERS

Thus, 1389 hybrid containers will be used. The number of PWR assemblies that are placed in PWR containers is:

4651 - (1389 x 3) = 484 ASSEMBLIES

The number of containers for PWR assemblies is:

484 ÷4 = 121 CONTAINERS
DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

1389 + 121 + 800 = 2310 CONTAINERS

Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK*	FACILITY TIME REQ'D
BWR RAIL	64	1128	72,192
BWR TRUCK	357	585	208,845
PWR RAIL	122	764	93,208
PWR TRUCK	698	531	370,638
TOTAL			744,883

* See CALCULATION OF CASK UNLOADING TIMES (Section C)

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Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN*
SNF 744,883(MIN)	9	5	4	3
DHLW** 88,800(MIN)	1	-	-	-

* See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section D)

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CASE 3:

1.0 Description:

The MRS Facility provides storage capabilities only and the repository provides all of the packaging functions. The repository will be assumed to consolidate and package spent nuclear fuel assemblies for disposal.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

90% is from MRS
10% is from Western Reactors

2.1.1 Spent Nuclear Fuel from MRS
90% x 3000 = 2700 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 2700 x .333 = 900 MTU
PWR = 2700 x .667 = 1800 MTU

MRS to repository shipments are 100% rail.

SNF receipt by reactor type.

100% of SNF is intact

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No SNF is consolidated

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type

BWR/intact 900 ÷ 0.18 = 5000 assemblies
PWR/intact 1800 ÷ 0.43 = 4186 assemblies

Capacity of casks used to ship SNF to repository.

a. BWR INTACT ASSEMBLIES 48
b. PWR INTACT ASSEMBLIES 21

Number of SNF casks received annually at the repository by reactor type.

BWR/INTACT 5000 ÷ 48 = 104 casks
PWR/INTACT 4186 ÷ 21 = 199 casks

Total MRS Casks:
= 104 + 199 = 303 (100-T Casks)

Unit Trains from MRS:
303 ÷ 5 = 61 TRAINS

2.1.2 Spent Nuclear Fuel from Western Reactors
10% x 3000 = 300 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

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SNF receipt by reactor type.

BWR = 300 x .333 = 100 MTU
PWR = 300 x .667 = 200 MTU

Reactor to repository shipments are 55% rail, 45% truck.

SNF receipt by reactor type/transportation mode.

BWR/rail = 100 x .55 = 55 MTU
BWR/truck = 100 x .45 = 45 MTU
PWR/rail = 200 x .55 = 110 MTU
PWR/truck = 200 x .45 = 90 MTU

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type/transportation mode.

BWR/rail 55 ÷ 0.18 = 306 assemblies
BWR/truck 45 ÷ 0.18 = 250 assemblies
PWR/rail 110 ÷ 0.43 = 256 assemblies
PWR/truck 90 ÷ 0.43 = 209 assemblies

Capacity of casks used to ship SNF to repository.

a. BWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES) 48
b. BWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES) 7
c. PWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES) 21
d. PWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES) 3

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Number of SNF casks received annually at the repository by reactor type and transportation mode.

BWR/rail	306 ÷ 48	=	6	casks
BWR/truck	250 ÷ 7	=	36	casks
PWR/rail	256 ÷ 21	=	12	casks
PWR/truck	209 ÷ 3	=	70	casks

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHLW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware received at repository = None

2.4 Containers emplaced at the repository (consolidation at the repository)

95% CONSOLIDATION, 5% INTACT

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 28

SNF Assemblies per Container (See Fig. 1):

BWR INTACT	=	6
BWR CONSOLIDATED	=	18
PWR INTACT	=	3
PWR CONSOLIDATED	=	6

SNF from MRS:

BWR Intact SNF Containers:

=	5000 x 0.05	= 250 ASSEMBLIES
=	250 ÷ 6	= 41.7 CONTAINERS

BWR Consolidated SNF Containers:

=	5000 x .95	= 4750 ASSEMBLIES
=	4750 ÷ 18	= 264 CONTAINERS

PWR Intact SNF Containers:

=	4186x 0.05	= 209 ASSEMBLIES
=	209 ÷ 3	= 70 CONTAINERS

PWR Consolidated SNF Containers:

=	4186 x 0.95	= 3977 ASSEMBLIES
=	3977 ÷ 6	= 662.8 CONTAINERS

SNF from Western Reactors:

Total BWR Assemblies:

306(RAIL) + 250(TRUCK) = 556 ASSEMBLIES

BWR Intact SNF Containers:

=	556 x 0.05	= 28 ASSEMBLIES
=	28 ÷ 6	= 4.7 CONTAINERS

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 29

BWR Consolidated SNF Containers:

= 556 x .95 = 528 ASSEMBLIES
= 528 ÷ 18 = 29 CONTAINERS

Total PWR Assemblies:

256(RAIL) + 209(TRUCK) = 465 ASSEMBLIES

PWR Intact SNF Containers:

= 465 x 0.05 = 23 ASSEMBLIES
= 23 ÷ 3 = 8 CONTAINERS

PWR Consolidated SNF Containers:

= 465 x 0.95 = 441.8 ASSEMBLIES
= 441.8 ÷ 6 = 73.6 CONTAINERS

Total SNF Containers:

BWR Intact:

= 41.7 + 4.7 = 46 CONTAINERS

BWR Consolidated:

= 264 + 29 = 293 CONTAINERS

PWR Intact:

= 70 + 8 = 78 CONTAINERS

PWR Consolidated:

= 662.8 + 73.6 = 736 CONTAINERS

Hardware from Consolidation at Repository:

PWR = 0
BWR = 108 BWR ASSEMBLIES PER CONTAINER

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

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PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 30

BWR Hardware Containers from MRS:

4750 ÷ 108 = 44 CONTAINERS

BWR Hardware Containers from Western Reactors:

528 ÷ 108 = 5 CONTAINERS

Total Hardware Containers:

44 + 5 = 49 CONTAINERS

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

46 + 293 + 78 + 736 + 49 + 800 = 2002 CONTAINERS

3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK†	FACILITY TIME REQ'D(Min)
BWR RAIL (104+6) =	110	1128	124,080
BWR TRUCK	36	585	21,060
PWR RAIL (199+12) =	211	764	161,204
PWR TRUCK	70	531	37,170
		TOTAL	343,514

† See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 31

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN*
SNF 343,514(MIN)	4	3	2	2
DHLW** 88,800(MIN)	1	-	-	-

* See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION QF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 32

CASE 4:

1.0 Description:

The MRS Facility provides storage capabilities only and the repository provides all of the packaging functions. There is no consolidation of spent fuel.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

90% is from MRS
10% is from Western Reactors

2.1.1 Spent Nuclear Fuel from MRS
90% x 3000 = 2700 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 2700 x .333 = 900 MTU
PWR = 2700 x .667 = 1800 MTU

MRS to repository shipments are 100% rail.

SNF receipt by reactor type.

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 33

100% of SNF is intact
No SNF is consolidated

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type

BWR/intact 900 ÷ 0.18 = 5000 assemblies
PWR/intact 1800 ÷ 0.43 = 4186 assemblies

Capacity of casks used to ship SNF to repository.

a. BWR INTACT ASSEMBLIES 48
b. PWR INTACT ASSEMBLIES 21

Number of SNF casks received annually at the repository by reactor type.

BWR/INTACT 5000 ÷ 48 = 104 casks
PWR/INTACT 4186 ÷ 21 = 199 casks

Total MRS Casks:
= 104 + 199 = 303 (100-T Casks)

Unit Trains from MRS:
303 ÷ 5 = 61 TRAINS

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 34

2.1.2 Spent Nuclear Fuel from Western Reactors
10% x 3000 = 300 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 300 x .333 = 100 MTU
PWR = 300 x .667 = 200 MTU

Reactor to repository shipments are 55% rail, 45% truck.

SNF receipt by reactor type/transportation mode.

BWR/rail = 100 x .55 = 55 MTU
BWR/truck = 100 x .45 = 45 MTU
PWR/rail = 200 x .55 = 110 MTU
PWR/truck = 200 x .45 = 90 MTU

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type/transportation mode.

BWR/rail 55 ÷ 0.18 = 306 assemblies
BWR/truck 45 ÷ 0.18 = 250 assemblies
PWR/rail 110 ÷ 0.43 = 256 assemblies
PWR/truck 90 ÷ 0.43 = 209 assemblies

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 35

Capacity of casks used to ship SNF to repository.

a.	BWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	48
b.	BWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	7
c.	PWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	21
d.	PWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	3

Number of SNF casks received annually at the repository by reactor type and transportation mode.

BWR/rail	306 ÷ 48	=	6	casks
BWR/truck	250 ÷ 7	=	36	casks
PWR/rail	256 ÷ 21	=	12	casks
PWR/truck	209 ÷ 3	=	70	casks

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHLW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware received at repository = None

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 36

2.4 Containers emplaced at the repository (no consolidation)

SNF Assemblies per Container (See Fig. 2):

BWR/PWR INTACT	=	4/3
BWR CONSOLIDATED	=	N/A
PWR INTACT	=	4
PWR CONSOLIDATED	=	N/A
BWR INTACT	=	10

Use of hybrid (BWR/PWR) containers is preferred. The number of hybrid containers is determined by the type fuel that requires the fewer number of containers.

Total BWR Assemblies:

5000 + 306 + 250 = 5556 ASSEMBLIES

BWR/PWR SNF Containers for BWR assemblies:

5556 ÷ 4 = 1389 CONTAINERS

Total PWR Assemblies:

4186 + 256 + 209 = 4651 ASSEMBLIES

BWR/PWR SNF Containers for PWR assemblies:

4651 ÷ 3 = 1550 CONTAINERS

Thus, 1389 hybrid containers will be used. The number of PWR assemblies that are placed in PWR containers is:

4651 - (1389 x 3) = 484 ASSEMBLIES

The number of containers for PWR assemblies is:

484 ÷4 = 121 CONTAINERS

Hardware containers = None

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

1389 + 121 + 800 =2310 CONTAINERS

3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK†	FACILITY TIME REQ'D(Min)
BWR RAIL (104+6) =	110	1128	124,080
BWR TRUCK	36	585	21,060
PWR RAIL (199+12) =	211	764	161,204
PWR TRUCK	70	531	37,170
		TOTAL	343,514

† See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

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SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 38

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN*
SNF 343,514(MIN)	4	3	2	2
DHLW** 88,800(MIN)	1	-	-	-

* See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 39

CASE 5:

1.0 Description:

The MRS Facility provides storage capabilities and also consolidates and places the spent fuel into canisters. The repository will then place the canisters into containers. SNF from Western Reactors is shipped directly to the repository.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

90% is from MRS
10% is from Western Reactors

2.1.1 Spent Nuclear Fuel from MRS
90% x 3000 = 2700 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 2700 x .333 = 900 MTU
PWR = 2700 x .667 = 1800 MTU

MRS to repository shipments are 100% rail.

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

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PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 40

SNF receipt by reactor type/form.

5% is intact
95% is consolidated

BWR/intact	= 900 x .05	=	45 MTU
BWR/consol	= 900 x .95	=	855 MTU
PWR/intact	=1800 x .05	=	90 MTU
PWR/consol	=1800 x .95	=	1710 MTU

MTU per BWR assembly	=	0.18
MTU per PWR assembly	=	0.43

SNF assembly receipt by reactor type/form.

BWR/intact	45 ÷ 0.18	=	250	assemblies
BWR/consol	855 ÷ 0.18	=	4750	assemblies
PWR/intact	90 ÷ 0.43	=	209	assemblies
PWR/consol	1710 ÷ 0.43	=	3977	assemblies

Capacity of casks used to ship SNF to repository.

a.	BWR INTACT ASSEMBLIES	61
b.	BWR CONSOLIDATED ASSEMBLIES	140
c.	PWR INTACT ASSEMBLIES	28
d.	PWR CONSOLIDATED ASSEMBLIES	56

Capacity of canisters for SNF

a.	BWR INTACT ASSEMBLIES	1
b.	BWR CONSOLIDATED ASSEMBLIES	5
c.	PWR INTACT ASSEMBLIES	1
d.	PWR CONSOLIDATED ASSEMBLIES	2

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 41

Number of SNF canisters received annually at the repository by reactor type and form.

BWR/INTACT	250 ÷ 1	=	250	canisters
BWR/CONSOL	4750 ÷ 5	=	950	canisters
PWR/INTACT	209 ÷ 1	=	209	canisters
PWR/CONSOL	3977 ÷ 2	=	1988	canisters

Capacity of casks used to ship SNF to repository.

a.	BWR INTACT CANISTERS	61
b.	BWR CONSOLIDATED CANISTERS	28
c.	PWR INTACT CANISTERS	28
d.	PWR CONSOLIDATED CANISTERS	28

Number of SNF casks received annually at the repository by reactor type and form.

BWR/INTACT	250 ÷ 61	=	4	casks
BWR/CONSOL	950 ÷ 28	=	34	casks
PWR/INTACT	209 ÷ 28	=	7	casks
PWR/CONSOL	1988 ÷ 28	=	71	casks

Total MRS Casks:

BWR = 4 + 34 = 38 (150-T Casks)

PWR = 7 + 71 = 78 (150-T Casks)

Unit Trains from MRS:

(38 + 78) ÷ 5 = 24 TRAINS

2.1.2 Spent Nuclear Fuel from Western Reactors

10% x 3000 = 300 MTU

CALCULATION SHEET

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SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 42

100% of SNF from Western Reactors is emplaced intact.

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 300 x .333 = 100 MTU
PWR = 300 x .667 = 200 MTU

Reactor to repository shipments are 55% rail, 45% truck.

SNF receipt by reactor type/transportation mode.

BWR/rail = 100 x .55 = 55 MTU
BWR/truck = 100 x .45 = 45 MTU
PWR/rail = 200 x .55 = 110 MTU
PWR/truck = 200 x .45 = 90 MTU

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type/transportation mode.

BWR/rail 55 ÷ 0.18 = 306 assemblies
BWR/truck 45 ÷ 0.18 = 250 assemblies
PWR/rail 110 ÷ 0.43 = 256 assemblies
PWR/truck 90 ÷ 0.43 = 209 assemblies

Capacity of casks used to ship SNF to repository.

a. BWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES) 48
b. BWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES) 7
c. PWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES) 21
d. PWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES) 3

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 43

Number of SNF casks received annually at the repository by reactor type and transportation mode.

BWR/rail	306 ÷ 48	=	6	casks
BWR/truck	250 ÷ 7	=	36	casks
PWR/rail	256 ÷ 21	=	12	casks
PWR/truck	209 ÷ 3	=	70	casks

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHVW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware from MRS received at repository:

4750 CONSOLIDATED BWR ASSEMBLIES

4750 ÷ 7	= 679 DRUMS
679 ÷ 5	= 136 CANISTERS

3977 CONSOLIDATED PWR ASSEMBLIES

3977 ÷ 7 = 568 DRUMS

568 ÷ 5 = 114 CANISTERS

TOTAL = 250 CANISTERS

Hardware Casks:

= 250 ÷ 4 = 63 CASKS

For 24 unit trains, up to 3 casks per unit train are required.

2.4 Containers emplaced at the repository

95% CONSOLIDATION, 5% INTACT

SNF Assemblies per Container (See Fig.3):

BWR INTACT	=	9
BWR CONSOLIDATED	=	20
PWR INTACT	=	4
PWR CONSOLIDATED	=	6

Containers for BWR Intact Assemblies from MRS:

250 ÷ 9 = 28 CONTAINERS

CALCULATION SHEET

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SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 45

Containers for BWR Intact Assemblies from Western Reactors:

306(RAIL) + 250(TRUCK) = 556 ASSEMBLIES
556 ÷ 9 = 62 CONTAINERS

TOTAL INTACT BWR CONTAINERS = 28+62 = 90 CONTAINERS

BWR Consolidated SNF Containers:

= 4750 ÷ 20 = 237 CONTAINERS

Containers for PWR Intact Assemblies from MRS:

209 ÷ 4 = 52 CONTAINERS

Containers for PWR Intact Assemblies from Western Reactors:

256(RAIL) + 209(TRUCK) = 465 ASSEMBLIES
465 ÷ 4 = 116 CONTAINERS

TOTAL INTACT PWR CONTAINERS = 52+116 = 168 CONTAINERS

PWR Consolidated SNF Containers:

= 3977 ÷ 6 = 663 CONTAINERS

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

Hardware Containers: (1 Container per canister)
= 250 CONTAINERS

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 46

The total number of containers emplaced annually is:

90 + 237 + 168 + 663 + 250 + 800 = 2208 CONTAINERS

3.0 Productivity Time Required for SNF Cask Unloading.

	NO. OF CASKS	TIME PER CASK*	FACILITY TIME REQ'D(MIN)
BWR RAIL (FROM REACTORS)	6	1128	6,768
BWR TRUCK (FROM REACTORS)	36	585	21,060
PWR RAIL (FROM REACTORS)	12	764	9,168
PWR TRUCK (FROM REACTORS)	70	531	37,170
BWR INTACT (FROM MRS)	4	1304	5,216
BWR CONSOL (FROM MRS)	34	858	29,172
PWR INTACT (FROM MRS)	7	858	6,006
PWR CONSOL (FROM MRS)	71	858	60,918
HARDWARE	63	544	34,272
		TOTAL	209,750

* See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 47

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN*
SNF 209,750(MIN)	3	2	1	1
DHLW ** 88,800(MIN)	1	-	-	-

* See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 48

CASE 6:

1.0 Description:

All spent fuel, including fuel from Western Reactors is sent to the MRS. The MRS Facility does not consolidate, but packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are returned to the MRS for repair.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

100% is from MRS
None is from Western Reactors (all SNF from Western Reactors is sent to MRS)

2.1.1 Spent Nuclear Fuel from MRS
= 3000 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 3000 x .333 = 1000 MTU
PWR = 3000 x .667 = 2000 MTU

MRS to repository shipments are 100% rail.

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 49

SNF receipt by reactor type.

100% of SNF is intact
No SNF is consolidated

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type

BWR/intact	1000 ÷ 0.18	=	5556	assemblies
PWR/intact	2000 ÷ 0.43	=	4651	assemblies

Capacity of casks used to ship SNF to repository.

a.	BWR/PWR-MIXED ASSEMBLIES	16/12
b.	BWR INTACT ASSEMBLIES	40
c.	PWR INTACT ASSEMBLIES	16

Number of SNF casks received annually at the repository by reactor type:

The number of hybrid (BWR/PWR-mixed) casks is determined by the type fuel that requires the fewer number of casks.

BWR/PWR SNF casks for BWR assemblies:

5556 ÷ 16 = 347 casks

BWR/PWR SNF casks for PWR assemblies:

4651 ÷ 12 = 388 casks

Thus, 347 hybrid casks will be used. The number of PWR assemblies placed in PWR casks is:

4651 - (347 x 12) = 487 assemblies

The number of PWR intact casks is:

487 ÷ 16 = 30 casks

Total MRS Casks:
= 347 + 30 = 377 Casks

Unit Trains from MRS:
377 ÷ 5 = 76 TRAINS

2.1.2 There is no SNF from Western Reactors

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHLW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware received at repository = None

2.4 Containers emplaced at the repository (no consolidation)

SNF Assemblies per Container (See Fig. 2):

BWR/PWR INTACT	=	4/3
BWR CONSOLIDATED	=	N/A
PWR INTACT	=	4
PWR CONSOLIDATED	=	N/A
BWR INTACT	=	10

Use of hybrid (BWR/PWR) containers is preferred. The number of hybrid containers is determined by the type fuel that requires the fewer number of containers.

BWR/PWR SNF Containers for BWR assemblies:

5556 ÷ 4 = 1389 CONTAINERS

BWR/PWR SNF Containers for PWR assemblies:

4651 ÷ 3 = 1550 CONTAINERS

Thus, 1389 hybrid containers will be used. The number of PWR assemblies that are placed in PWR containers is:

4651 - (1389 x 3) = 484 ASSEMBLIES

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 52

The number of containers for PWR assemblies is:

484 ÷4 = 121 CONTAINERS

Hardware containers = None

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

1389 + 121 + 800 =2310 CONTAINERS

3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK†	FACILITY TIME REQ'D(Min)
BWR/PWR INTACT =	347	544	188,768
PWR INTACT =	30	544	16,320
		TOTAL	205,088

† See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 53

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN*
SNF 205,088(MIN)	3	2	1	1
DHLW** 88,800(MIN)	1	-	-	-

* See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 54

CASE 7:

1.0 Description:

All spent fuel, including fuel from Western Reactors is sent to MRS. The MRS Facility does not consolidate, but packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are repaired at the repository.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

100% is from MRS
None is from Western Reactors (all SNF from Western Reactors is sent to MRS)

2.1.1 Spent Nuclear Fuel from MRS
= 3000 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 3000 x .333 = 1000 MTU
PWR = 3000 x .667 = 2000 MTU

MRS to repository shipments are 100% rail.

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 55

SNF receipt by reactor type.

100% of SNF is intact
No SNF is consolidated

MTU per BWR assembly = 0.18
MTU per PWR assembly = 0.43

SNF assembly receipt by reactor type

BWR/intact	1000 ÷ 0.18	=	5556	assemblies
PWR/intact	2000 ÷ 0.43	=	4651	assemblies

Capacity of casks used to ship SNF to repository.

a.	BWR/PWR-MIXED ASSEMBLIES	16/12
b.	BWR INTACT ASSEMBLIES	40
c.	PWR INTACT ASSEMBLIES	16

Number of SNF casks received annually at the repository by reactor type:

The number of hybrid (BWR/PWR-mixed) casks is determined by the type fuel that requires the fewer number of casks.

BWR/PWR SNF casks for BWR assemblies:

5556 ÷ 16 = 347 casks

BWR/PWR SNF casks for PWR assemblies:

4651 ÷ 12 = 388 casks

Thus, 347 hybrid casks will be used. The number of PWR assemblies placed in PWR casks is:

4651 - (347 x 12) = 487 assemblies

The number of PWR intact casks is:

487 ÷ 16 = 30 casks

Total MRS Casks:
= 347 + 30 = 377 Casks

Unit Trains from MRS:
377 ÷ 5 = 76 TRAINS

2.1.2 There is no SNF from Western Reactors

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHLW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware received at repository = None

2.4 Containers emplaced at the repository (no consolidation)

SNF Assemblies per Container (See Fig. 2):

BWR/PWR INTACT	=	4/3
BWR CONSOLIDATED	=	N/A
PWR INTACT	=	4
PWR CONSOLIDATED	=	N/A
BWR INTACT	=	10

Use of hybrid (BWR/PWR) containers is preferred. The number of hybrid containers is determined by the type fuel that requires the fewer number of containers.

BWR/PWR SNF Containers for BWR assemblies:

5556 ÷ 4 = 1389 CONTAINERS

BWR/PWR SNF Containers for PWR assemblies:

4651 ÷ 3 = 1550 CONTAINERS

Thus, 1389 hybrid containers will be used. The number of PWR assemblies that are placed in PWR containers is:

4651 - (1389 x 3) = 484 ASSEMBLIES

The number of containers for PWR assemblies is:

484 ÷4 = 121 CONTAINERS

Hardware containers = None

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

1389 + 121 + 800 =2310 CONTAINERS

3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK†	FACILITY TIME REQ'D(Min)
BWR/PWR INTACT =	347	544	188,768
PWR INTACT =	30	544	16,320
		TOTAL	205,088

† See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 59

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN*
SNF 205,088(MIN)	3	2	1	1
DHLW** 88,800(MIN)	1	-	-	-

* See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 60

CASE 8:

1.0 Description:

All spent fuel, including fuel from Western Reactors is sent to MRS. The MRS Facility consolidates and packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are returned to the MRS for repair.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

100% is from MRS
None is from Western Reactors (all SNF from Western Reactors is sent to MRS)

2.1.1 Spent Nuclear Fuel from MRS

= 3000 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 3000 x .333 = 1000 MTU
PWR = 3000 x .667 = 2000 MTU

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 61

MRS to repository shipments are 100% rail.

SNF receipt by reactor type/form.

5% is intact
95% is consolidated

BWR/intact	=1000 x .05	=	50 MTU
BWR/consol	=1000 x .95	=	950 MTU
PWR/intact	=2000 x .05	=	100 MTU
PWR/consol	=2000 x .95	=	1900 MTU

MTU per BWR assembly	=	0.18
MTU per PWR assembly	=	0.43

SNF assembly receipt by reactor type/form.

BWR/intact	50 ÷ 0.18	=	278	assemblies
BWR/consol	950 ÷ 0.18	=	5278	assemblies
PWR/intact	100 ÷ 0.43	=	233	assemblies
PWR/consol	1900 ÷ 0.43	=	4419	assemblies

Capacity of casks used to ship SNF to repository.

a.	BWR INTACT ASSEMBLIES	24
b.	BWR CONSOLIDATED ASSEMBLIES	72
c.	PWR INTACT ASSEMBLIES	12
d.	PWR CONSOLIDATED ASSEMBLIES	24

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 62

Number of SNF casks received annually at the repository by reactor type and form.

BWR/INTACT	278 ÷ 24 ≐	12	casks
BWR/CONSOL	5278 ÷ 72 =	73	casks
PWR/INTACT	233 ÷ 12 =	19	casks
PWR/CONSOL	4419 ÷ 24 =	184	casks

Total MRS Casks:

BWR = 12 + 73 = 85 Casks

PWR = 19 + 184 = 203 Casks

Unit Trains from MRS:

(85 + 203) ÷ 5 = 58 TRAINS

2.1.2 There is no SNF from Western Reactors

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHVW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 63

2.3 Hardware from MRS received at repository:

PWR* = 0
BWR = one container per 108 BWR ASSEMBLIES
* Hardware from PWRs fits into PWR consolidated containers.

5278 CONSOLIDATED BWR ASSEMBLIES
5278 ÷ 108 = 49 CANISTERS

Hardware Casks:

49 ÷ 4 = 12 CASKS

2.4 Containers emplaced at the repository (SNF consolidated and package at MRS)

95% CONSOLIDATION, 5% INTACT

SNF Assemblies per Container (See Fig. 1):

BWR INTACT	=	6
BWR CONSOLIDATED	=	18
PWR INTACT	=	3
PWR CONSOLIDATED	=	6

BWR Intact SNF Containers:
= 278 ÷ 6 = 46 CONTAINERS

BWR Consolidated SNF Containers:
= 5278 ÷ 18 = 293 CONTAINERS

PWR Intact SNF Containers:
233 ÷ 3 = 78 CONTAINERS

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 64

PWR Consolidated SNF Containers:
4419 ÷ 6 = 736 CONTAINERS

Hardware Containers:

One Hardware Canister per Container:
= 49 CONTAINERS

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

46 + 293 + 78 + 736 + 49 + 800 = 2002 CONTAINERS

3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK*	FACILITY TIME REQ'D
BWR INTACT	12	544	6,528
BWR CONSOL.	73	544	39,712
PWR INTACT	19	544	10,336
PWR CONSOL.	184	544	100,096
HARDWARE	12	544	6,528
		TOTAL	163,200

* See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 65

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90.000 MIN	10 SHIFTS 162.000 MIN	15 SHIFTS 216.000 MIN	21 SHIFTS 264.600 MIN†
SNF 163,200(MIN)	2	1	1	1
DHLW** 88,800(MIN)	1	-	-	-

† See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 66

CASE 9:

1.0 Description:

All spent fuel, including fuel from Western Reactors is sent to MRS. The MRS Facility consolidates and packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are repaired at the repository.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

100% is from MRS
None is from Western Reactors (all SNF from Western Reactors is sent to MRS)

2.1.1 Spent Nuclear Fuel from MRS
= 3000 MTU

FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 33.3%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 66.7%

SNF receipt by reactor type.

BWR = 3000 x .333 = 1000 MTU
PWR = 3000 x .667 = 2000 MTU

MRS to repository shipments are 100% rail.

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 67

SNF receipt by reactor type/form.

5% is intact
95% is consolidated

BWR/intact	=1000 x .05	=	50 MTU
BWR/consol	=1000 x .95	=	950 MTU
PWR/intact	=2000 x .05	=	100 MTU
PWR/consol	=2000 x .95	=	1900 MTU

MTU per BWR assembly	=	0.18
MTU per PWR assembly	=	0.43

SNF assembly receipt by reactor type/form.

BWR/intact	50 ÷ 0.18	=	278	assemblies
BWR/consol	950 ÷ 0.18	=	5278	assemblies
PWR/intact	100 ÷ 0.43	=	233	assemblies
PWR/consol	1900 ÷ 0.43	=	4419	assemblies

Capacity of casks used to ship SNF to repository.

a.	BWR INTACT ASSEMBLIES	24
b.	BWR CONSOLIDATED ASSEMBLIES	72
c.	PWR INTACT ASSEMBLIES	12
d.	PWR CONSOLIDATED ASSEMBLIES	24

Number of SNF casks received annually at the repository by reactor type and form.

BWR/INTACT	278 ÷ 24 =	12	casks
BWR/CONSOL	5278 ÷ 72 =	73	casks
PWR/INTACT	233 ÷ 12 =	19	casks
PWR/CONSOL	4419 ÷ 24 =	184	casks

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 68

Total MRS Casks:
BWR = 12 + 73 = 85 Casks
PWR = 19 + 184 = 203 Casks

Unit Trains from MRS:
(85 + 203) ÷ 5 = 58 TRAINS

2.1.2 There is no SNF from Western Reactors

2.2 DHLW and WVHLW

Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHVW CANISTERS = 400 ÷ 0.5 = 800

RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware from MRS received at repository:

PWR* = 0
BWR = one container per 108 BWR ASSEMBLIES
* Hardware from PWRs fits into PWR consolidated containers.

5278 CONSOLIDATED BWR ASSEMBLIES
5278 ÷ 108 = 49 CANISTERS

Hardware Casks:

49 ÷ 4 = 12 CASKS

2.4 Containers emplaced at the repository (SNF consolidated and package at MRS)

95% CONSOLIDATION, 5% INTACT

SNF Assemblies per Container (See Fig. 1):

BWR INTACT	=	6
BWR CONSOLIDATED	=	18
PWR INTACT	=	3
PWR CONSOLIDATED	=	6

BWR Intact SNF Containers:
= 278 ÷ 6 = 46 CONTAINERS

BWR Consolidated SNF Containers:
= 5278 ÷ 18 = 293 CONTAINERS

PWR Intact SNF Containers:
233 ÷ 3 = 78 CONTAINERS

PWR Consolidated SNF Containers:
4419 ÷ 6 = 736 CONTAINERS

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 70

Hardware Containers:

One Hardware Canister per Container:
= 49 CONTAINERS

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

46 + 293 + 78 + 736 + 49 + 800 = 2002 CONTAINERS

3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK*	FACILITY TIME REQ'D
BWR INTACT	12	544	6,528
BWR CONSOL	73	544	39,712
PWR INTACT	19	544	10,336
PWR CONSOL	184	544	100,096
HARDWARE	12	544	6.528
		TOTAL	163,200

* See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 71

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN†
SNF 163,200(MIN)	2	1	1	1
DHLW** 88,800(MIN)	1	-	-	-

† See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. B

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED [illegible] DATE 11/18/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 72

SCP-CDR:

1.0 Description:

There is no MRS facility and the repository provides all of the packaging and consolidation of spent fuel. See Section 2.6.1 of SAND86-2357 (Reference 1) for assumptions. Applicable page numbers are shown in the margins below.

2.0 Material Received:

2.1 Spent Nuclear Fuel (SNF)

(Page 2-1) The maximum annual repository receipt of spent nuclear fuel from commercial nuclear power reactors is 3000 MTU.

(Page 2-4) FRACTION OF ANNUAL RECEIPT IN THE FORM OF BWR ASSEMBLIES = 40%
FRACTION OF ANNUAL RECEIPT IN THE FORM OF PWR ASSEMBLIES = 60%

SNF receipt by reactor type.

BWR = 3000 x .4 = 1200 MTU
PWR = 3000 x .6 = 1800 MTU

(Page 2-12) Reactor to repository shipments are 30% rail, 70% truck.

SNF receipt by reactor type/transportation mode.

BWR/rail = 1200 x .30 = 360 MTU
BWR/truck = 1200 x .70 = 840 MTU
PWR/rail = 1800 x .30 = 540 MTU
PWR/truck = 1800 x .70 = 1260 MTU

CALCULATION SHEET

CALC. NO. M-150 REV. NO. B

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED [signature] DATE 11/18/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 73

(Page 2-4) MTU per BWR assembly = 0.1833
MTU per PWR assembly = 0.4614

SNF assembly receipt by reactor type/transportation mode.

BWR/rail	360 ÷ 0.1833 =	1964	assemblies
BWR/truck	840 ÷ 0.1833 =	4583	assemblies
PWR/rail	540 ÷ 0.4614 =	1170	assemblies
PWR/truck	1260 ÷ 0.4614 =	2731	assemblies

(Page 2-12) Capacity of casks used to ship SNF to repository.

a.	BWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	36
b.	BWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	5
c.	PWR RAIL CASKS FROM REACTOR (INTACT ASSEMBLIES)	14
d.	PWR TRUCK CASKS FROM REACTOR (INTACT ASSEMBLIES)	2

Number of SNF casks received annually at the repository by reactor type and transportation mode.

BWR/rail	1964 ÷ 36 =	55	casks
BWR/truck	4583 ÷ 5 =	917	casks
PWR/rail	1170 ÷ 14 =	84	casks
PWR/truck	2731 ÷ 2 =	1366	casks

2.2 DHLW and WVHLW

(Page 2-1) Maximum annual repository receipt of WVHLW and DHLW is 400 MTU.

MTU PER CANISTER = 0.5

NO. OF DHLW CANISTERS = 400 ÷ 0.5 = 800

CALCULATION SHEET

CALC. NO. M-150 REV. NO. B

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED [signature] DATE 9/18/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 74

(Page 2-1) RAIL SHIPMENT WITH 5 CANISTERS PER CASK

DHLW casks received annually at the repository.

RAIL CASKS = 800 ÷ 5 = 160

2.3 Hardware received at repository = 0

2.4 Containers emplaced at the repository (consolidation at the repository)

(Page 2-4) 90% CONSOLIDATION, 10% INTACT

(Page 2-20) SNF Assemblies per Container (See Fig. 11, page 2-19):

BWR INTACT	=	6
BWR CONSOLIDATED	=	18
PWR INTACT	=	3
PWR CONSOLIDATED	=	6

Total BWR Assemblies:

1964(RAIL) + 4583(TRUCK) = 6547 ASSEMBLIES

BWR Intact SNF Containers:

=	6547 x 0.10	= 655 ASSEMBLIES
=	655 ÷ 6	= 109 CONTAINERS

BWR Consolidated SNF Containers:

=	6547 x 0.90	= 5892 ASSEMBLIES
=	5892 ÷ 18	= 327 CONTAINERS

CALCULATION SHEET

CALC. NO. M-150 REV. NO. B

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED [signature] DATE 11/18/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 75

Total PWR Assemblies:

1170(RAIL) + 2731(TRUCK) = 3901 ASSEMBLIES

PWR Intact SNF Containers:

3901 x 0.10 = 390 ASSEMBLIES
390 ÷ 3 = 130 CONTAINERS

PWR Consolidated SNF Containers:

3901 x 0.90 = 3511 ASSEMBLIES
3511 ÷ 6 = 585 CONTAINERS

(Page 2-16) Hardware containers from Consolidation at Repository:

PWR* = 0
BWR = one container per 108 BWR ASSEMBLIES

* Hardware from PWRs fits into PWR consolidated containers

Hardware Containers:

6547 x 0.90 ÷ 108 = 55 CONTAINERS

DHLW (1 CANISTER PER CONTAINER)
= 800 CONTAINERS

The total number of containers emplaced annually is:

109 + 327 + 130 + 585 + 55 + 800= 2006 CONTAINERS

CALCULATION SHEET

CALC. NO. M-150 REV. NO. B

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED [signature] DATE 9/18/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 76

3.0 Productivity Time Required for SNF Wastes.

	NO. OF CASKS	TIME PER CASK*	FACILITY TIME REQ'D
BWR RAIL	55	1128	62,040
BWR TRUCK	917	585	536,445
PWR RAIL	84	764	64,176
PWR TRUCK	1366	531	725,346
		TOTAL	1,388,007

* See CALCULATION OF TOTAL CASK UNLOADING TIMES (Section C)

3.1 Unloading Ports Required.
(Time Required ÷ Time Available)

	5 SHIFTS 90,000 MIN	10 SHIFTS 162,000 MIN	15 SHIFTS 216,000 MIN	21 SHIFTS 264,600 MIN†
SNF 1,388,007(MIN)	16	9	7	6
DHLW** 88,800(MIN)	1	-	-	-

† See CALCULATION OF PRODUCTIVITY TIME AVAILABLE (Section E)
* * See CALCULATION OF PRODUCTIVITY TIME FOR DHLW (Section D)

CALCULATION SHEET

CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 77

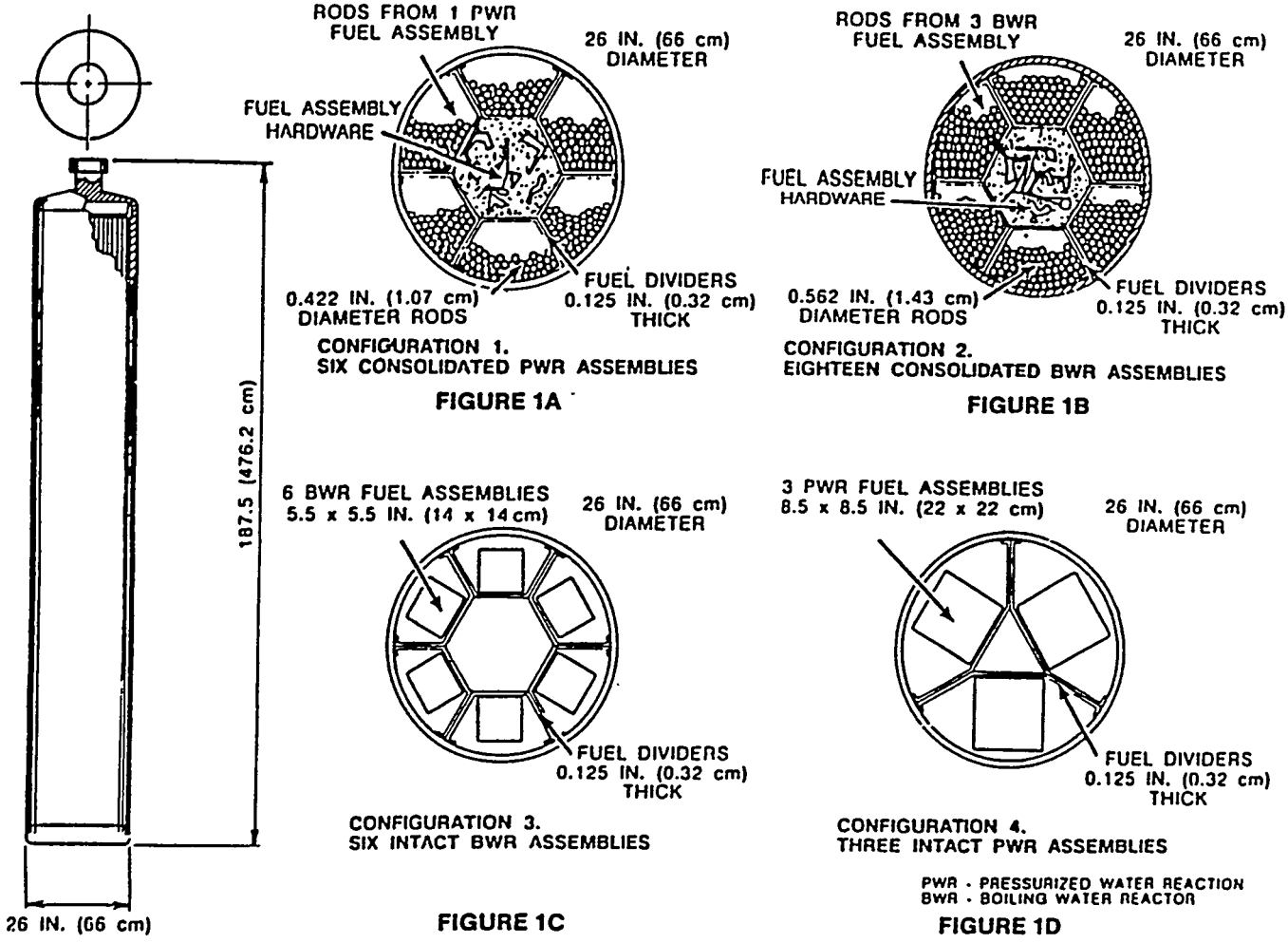


FIGURE 1
REPOSITORY REFERENCE DESIGN CONTAINERS

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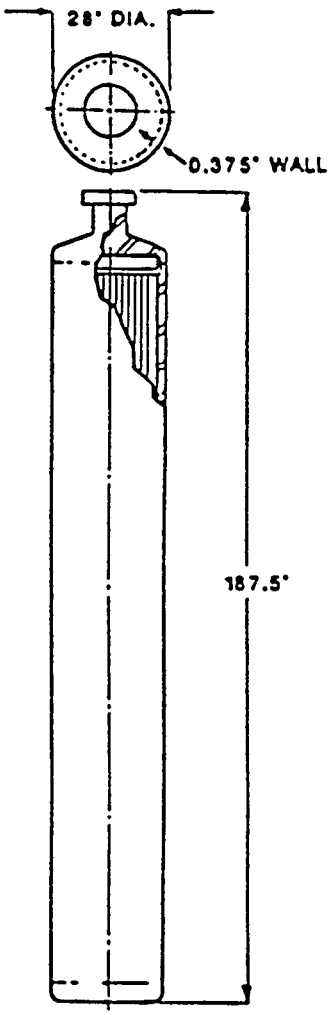
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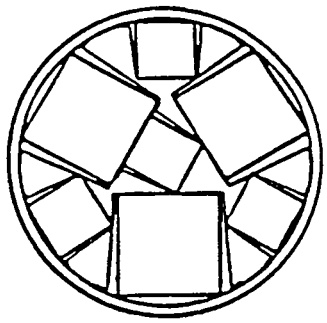
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ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

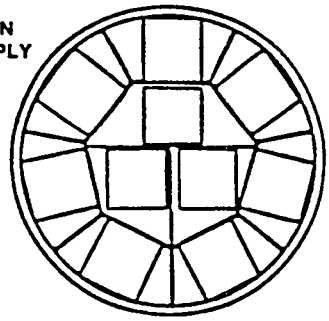
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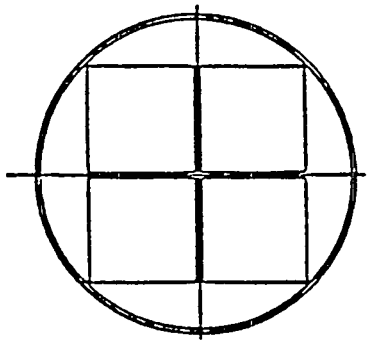


3 PWRS + 4 BWRS
FIGURE 2A (LOADED WEIGHT-9,800 lbJ

NOTE:
PREFERRED CONFIGURATION WHEN THE SUPPLY OF PWR'S AND BWR'S ALLOW.



10 BWRS
FIGURE 2B (LOADED WEIGHT-9,500 lbJ



4 PWRS
FIGURE 2C (LOADED WEIGHT-9,500 lbJ

FIGURE 2
INTACT FUEL CONFIGURATIONS

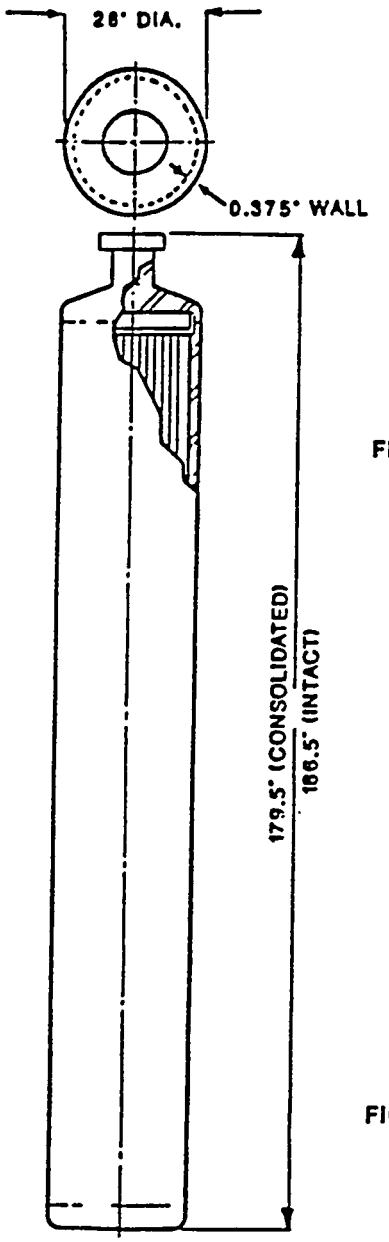
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CALC. NO. M-150 REV. NO. A

ORIGINATOR T. Sinagra DATE 9/14/88 CHECKED JLH DATE 9/16/88

PROJECT Tuff Repository JOB NO. 16039-100

SUBJECT MRS Study-Cask & Container Annual Throughput SHEET NO. 79



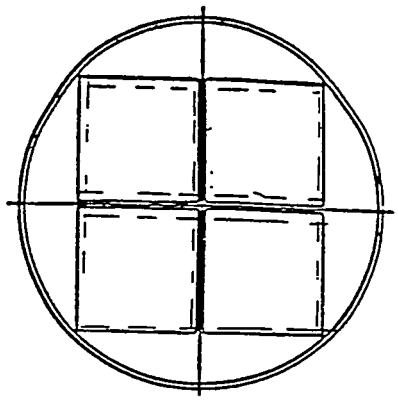


FIGURE 3A

4 INTACT PWRS
(LOADED WEIGHT-10,350 lb.)
OR
6 CONS. PWRS (POWER LIMITED)
(LOADED WEIGHT-12,300 lb.)
OR,
20 CONS. BWRS
(LOADED WEIGHT-16,900 lb.)

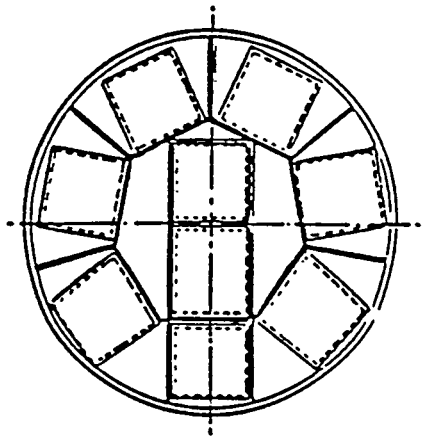


FIGURE 3B

9 INTACT BWRS
(LOADED WEIGHT-11,650 lb.)

FIGURE 3
CANISTERED FUEL CONFIGURATIONS

Appendix B

COST ESTIMATE DETAILS

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Case 1
Case 2
Case 3
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Case 6
Case 7
Case 8
Case 9

Case 1

Contents

Summary Cost Matrix (Table 1)

Surface Facility Capital Costs

Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

Underground Facilities, Project Phase 1 (Capital Costs - Engineering and Construction)

Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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TABLE 1, MRS SYSTEMS STUDY - CASE 1 COST MATRIX (Continued)
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO & DEC	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$360.17	$27.45	$26.52	$53.97	$14.61	$6.87	$21.47	$435.61
	1000	SUPPORT CONTRACTOR	$56.38	$0.00	$0.00	$0.00	$2.92	$0.90	$3.82	$60.20
	1010	Surface	$41.45			$0.00		$0.90	$0.90	
	1020	Subsurface	$14.94			$0.00	$2.92		$2.92	
	2000	ARCHITECT-ENGINEER	$225.54	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX	$11.69	$3.58	$15.27	$240.81
	2010	Surface	$165.79	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$59.75	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX	$11.69		$11.69	
	3000	CONSTRUCTION MANAGEMENT	$77.24	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$79.63
	3010	Surface	$54.98	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$22.26			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.45	$0.52	$3.97			$0.00	$3.97
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$97.58	$16.21	$113.79	$1.50	$39.85	$41.35	$333.15
	11000	EMPLOYEE TRANSPORTATION		$89.69	$13.87	$103.56	$1.20		$1.20	$104.76
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.30	$5.04	$5.34	$47.08
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$633.30	$2,303.36	$222.89	$2,526.25	$42.44	$41.32	$83.76	$3,243.31
4.3.2.1	21000	WASTE HANDLING FACILITY	$495.24	$1,205.24	$34.51	$1,239.75	XXXXXXXXX	$33.94	$33.94	$1,768.93
	21100	Waste Handling Building 1:	$97.96	$0.00	$0.00	$0.00	XXXXXXXXX	$7.86	$7.86	
4.3.2.1.2	21102	Building/Structures	$49.95			$0.00	XXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$11.37			$0.00	XXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$7.62			$0.00	XXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$4.98			$0.00	XXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$20.79			$0.00	XXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$3.25			$0.00	XXXXXXXXX		$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 1 COST MATRIX (Continued)
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO & DEC	TOTAL
	21200	Waste Handling Building 2:	$350.90	$0.00	$0.00	$0.00	XXXXXXXXXXX	$21.76	$21.76	
4.3.2.1.9	21202	Building/Structures	$150.64			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$42.07			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$20.02			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$12.22			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$118.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$7.95			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$46.38	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.32	$4.32	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.89			$0.00	XXXXXXXXXXX	$1.81	$1.81	
	21502	Vehicle Wash Facility	$0.93			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.48			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$90.64	$1,071.35	$172.91	$1,244.26	$32.41	$4.67	$37.08	$1,371.98
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.06		$19.06	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.97			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$12.21			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$10.03	$2.71	$12.74	$102.40
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$9.64	$0.67	$10.31	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04	$9.64		$9.64	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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TABLE 1. MRS SYSTEMS STUDY - CASE 1 COST MATRIX (Continued)
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO & DEC	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.14	$2.04	$2.18	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.14		$0.14	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.13		$0.13	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.12	$0.00	$0.12	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.12		$0.12	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.24	XXXXXXXXXX	$3.24	$99.43
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.59	XXXXXXXXXX	$1.59	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.86	XXXXXXXXXX	$0.86	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXX	$0.41	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXX	$0.41	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXX	$0.37	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXX	$0.37	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$143.00	$834.95	$43.88	$878.84	$107.69	XXXXXXXXXX	$107.69	$1,129.53
4.3.4.1	41000	DEVELOPMENT	$122.82	$641.58	$41.43	$683.01	$13.60	XXXXXXXXXX	$13.60	$819.42
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXX	$0.00	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXX	$0.00	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXX	$0.00	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXX	$0.00	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXX	$0.00	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXX	$0.00	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$76.91	$443.01	XXXXXXXXXX	$443.01	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXX	$14.44	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXX	$47.06	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXX	$22.94	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41024	Emplacement Drifts	$23.75	$175.51	XXXXXXXXXX	$175.51	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$19.55	$183.07	XXXXXXXXXX	$183.07	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXX	$91.61	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXX	$91.61	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41040	Other Waste Facility Excavation	$3.32	$9.39	XXXXXXXXXX	$9.39	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$3.32	$9.39	XXXXXXXXXX	$9.39	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	41060	Excavated Material Handling	$12.87	$31.64	$0.00	$31.64	$0.00	XXXXXXXXXX	$0.00	
	41070	General Maintenance	$8.89	$65.93	$41.43	$107.36	$13.60	XXXXXXXXXX	$13.60	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.18	$193.38	$2.45	$195.83	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	$216.01
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$123.09	$0.00	$123.09	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.35	$6.34	$0.00	$6.34	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	

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TABLE 1, MRS SYSTEMS STUDY - CASE 1 COST MATRIX (Continued)
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO & DEC	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$94.09	XXXXXXXXXXX	$94.09	$94.09
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$4.98	XXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$3.04	XXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$1.69	XXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.59	XXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.56	XXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.12	XXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$83.12	XXXXXXXXXXX	$83.12	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$100.03	$670.01	$195.03	$865.05	$146.03	XXXXXXXXXXX	$146.03	$1,111.11
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$77.32	$527.79	$114.25	$642.04	$75.37	XXXXXXXXXXX	$75.37	$794.73
4.3.5.1.1	51010	Material Support, Receiving/warehousing	$12.96	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXX	$11.76	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXX	$11.76	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$39.88	$345.65	$33.44	$379.09	$21.88	XXXXXXXXXXX	$21.88	
	51031	Development Area	$38.88	$228.00	$24.42	$252.42	$21.88	XXXXXXXXXXX	$21.88	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$5.93	XXXXXXXXXXX	$5.93	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.01	$23.47	$8.70	$32.17	$20.85	XXXXXXXXXXX	$20.85	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$7.00	$36.54	$0.00	$36.54	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.7	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$2.72	XXXXXXXXXXX	$2.72	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.33	XXXXXXXXXXX	$0.33	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.48	XXXXXXXXXXX	$1.48	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$10.43	XXXXXXXXXXX	$10.43	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$54.66	XXXXXXXXXXX	$54.66	$117.93
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$10.98	XXXXXXXXXXX	$10.98	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.41	XXXXXXXXXXX	$0.41	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$43.27	XXXXXXXXXXX	$43.27	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$16.01	XXXXXXXXXXX	$16.01	$198.45
		TOTAL REPOSITORY	$1,480.09	$3,948.06	$520.45	$4,468.51	$315.51	$88.04	$403.54	$6,352.14
2.4	60000	EMPLACEMENT CONTAINTERS	XXXXXXXXXXXXXXX	$1,089.13	$8.74	$1,097.87	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$1,097.87
	61000	SPENT FUEL	XXXXXXXXXXXXXXX	$728.25	$0.00	$728.25	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$728.25
	61010	Intact PWR	XXXXXXXXXXXXXXX	$75.69	$0.00	$75.69	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXXX	$45.21		$45.21	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXXX	$434.39		$434.39	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXXX	$172.96		$172.96	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXXX	$215.56		$215.56	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$215.56
	63000	OTHER WASTE	XXXXXXXXXXXXXXX	$145.32	$8.74	$154.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$154.06
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXXX	$25.84	$0.00	$25.84	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXXX	$5.10		$5.10	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXXX	$108.00		$108.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	
	99999	TOTAL REPOSITORY, including EMPLACEMENT CONTAINTERS	$1,480.09	$5,037.19	$529.19	$5,566.38	$315.51	$88.04	$403.54	$7,450.01

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 1
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.5	2,383.5	0.0	3,021.0	637.5	89.4	25%	937.0	4,684.9	320.1	5,005.0	10%	365.9	18.3	96.1	480.3	5,485.3
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9	25%	588.1	2,940.6	200.6	3,141.2	10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0	25%	79.4	396.8	27.2	424.0	10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.1	0.0	0.0	822.1	822.1	0.0	20%	328.8	1,973.0	138.1	2,111.1	5%	82.2	4.1	17.3	103.6	2,214.7
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0	20%	696.1	4,176.5	292.4	4,468.9	5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3	20%	36.5	218.8	15.2	234.0	5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0	20%	143.5	860.9	60.3	921.2	5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.9	448.4	0.0	697.3	248.9	16.8	20%	192.6	1,155.6	79.5	1,235.1	5%	47.3	2.4	9.9	59.6	1,294.7
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,327.9	9,219.8	2,076.1	267.9	30%	3,469.1	15,032.9	1,027.9	16,060.8	15%	1,694.4	84.7	533.7	2,312.8	18,373.6
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.4	0.0	41.9	16.5	1.0	20%	11.9	71.3	4.9	76.2	5%	2.9	0.1	0.6	3.6	79.8
		SUBTOTAL 120 - ON SITE	222.4	$6,383.6	$6,316.3	$5,501.5	$18,201.4	$6,383.6	$443.3		$6,483.0	$31,511.3	$2,166.2	$33,677.5		$2,672.0	$133.7	$771.9	$3,577.6	$37,255.1
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1	25%	2,294.6	11,473.0	784.7	12,257.7	10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8	30%	1,598.4	6,926.5	477.0	7,403.5	15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.5	68,508.6	0.0	82,398.1	13,889.5	2,569.1	25%	24,714.2	123,570.9	8,425.2	131,996.1	10%	9,628.8	481.4	2,527.6	12,637.8	144,633.9
	130.50	OFF SITE - UTILITIES	39.1	1,133.4	949.5	224.7	2,307.6	1,133.4	44.0	30%	1,045.5	4,530.5	313.1	4,843.6	15%	516.2	25.8	162.6	704.6	5,548.2
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0	25%	6,961.1	34,805.6	2,386.7	37,192.3	10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.7	$24,233.4	$92,517.9	$230.0	$116,981.3	$24,233.4	$3,478.0		$36,613.8	$181,306.5	$12,386.7	$193,693.2		$14,555.7	$727.7	$3,889.3	$19,172.7	$212,865.9
4.3.1		TOTAL 100 - SITE	1,058.1	$30,617.0	$98,834.2	$5,731.5	$135,182.7	$30,617.0	$3,921.3		$43,096.8	$212,817.8	$14,552.9	227,370.7		$17,227.7	$861.4	$4,661.2	$22,750.3	$250,121.0
	211.02	WHB I - BUILDING/STRUCTURE	416.4	12,074.4	10,598.9	517.2	23,190.5	12,074.4	416.9	40%	14,272.7	49,954.5	3,456.0	53,410.5	25%	8,816.2	440.8	3,702.8	12,959.8	66,370.3
	211.03	WHB I - HOT CELL EQUIPMENT	44.8	1,299.8	0.0	5,325.4	6,625.2	1,299.8	199.7	40%	3,249.9	11,374.6	776.7	12,151.3	25%	1,981.3	99.1	832.2	2,912.6	15,063.9
	211.04	WHB I - UTILITIES	64.5	1,868.0	662.1	986.1	3,516.2	1,868.0	61.8	40%	2,178.4	7,624.4	527.7	8,152.1	25%	1,346.1	67.3	565.4	1,978.8	10,130.9
	211.05	WHB I - HVAC EQUIPMENT	29.6	857.7	927.6	850.2	2,635.5	857.7	66.7	40%	1,424.0	4,983.9	342.3	5,326.2	25%	873.3	43.7	366.8	1,283.8	6,610.0
	211.06	WHB I - HANDL/PACK EQUIP	67.5	1,956.1	0.0	10,539.9	12,496.0	1,956.1	395.2	40%	5,938.9	20,786.2	1,416.3	22,202.5	25%	3,613.0	180.7	1,517.5	5,311.2	27,513.7
	211.07	WHB I - SUPPORT FACILITIES	5.6	163.5	0.0	1,924.0	2,087.5	163.5	72.2	40%	929.3	3,252.5	220.6	3,473.1	25%	562.8	28.1	236.4	827.3	4,300.4
		SUBTOTAL 211 - WHB I	628.4	$18,219.5	$12,188.6	$20,142.8	$50,550.9	$18,219.5	$1,212.5		$27,993.2	$97,976.1	$6,739.6	$104,715.7		$17,192.7	$859.7	$7,221.1	$25,273.5	$129,989.2
	212.02	WHB II - BUILDING/STRUCT	1,289.8	37,404.2	30,069.4	1,536.3	69,009.9	37,404.2	1,185.2	40%	43,039.7	150,639.0	10,428.6	161,067.6	25%	26,603.5	1,330.2	11,173.5	39,107.2	200,174.8
	212.03	WHB II - HOT CELL EQUIP	150.0	4,351.5	0.0	20,577.2	24,928.7	4,351.5	771.6	40%	12,020.7	42,072.5	2,869.5	44,942.0	25%	7,320.1	366.0	3,074.4	10,760.5	55,702.5
	212.04	WHB II - UTILITIES	175.1	4,827.8	1,793.5	2,680.1	9,301.4	4,827.8	167.8	40%	5,718.8	20,015.8	1,384.7	21,400.5	25%	3,532.3	176.6	1,483.6	5,192.5	26,593.0
	212.05	WHB II - HVAC EQUIPMENT	77.3	2,241.2	2,519.5	1,569.8	6,330.5	2,241.2	153.3	40%	3,490.0	12,215.0	840.0	13,055.0	25%	2,142.9	107.1	900.0	3,150.0	16,205.0
	212.06	WHB II - HANDL/PACK EQUIP	321.2	9,315.4	0.0	63,280.1	72,595.5	9,315.4	2,373.0	40%	33,713.6	117,997.5	8,027.3	126,024.8	25%	20,477.7	1,023.9	8,600.6	30,102.2	156,127.0
	212.07	WHB II - SUPPORT FAC.	18.9	549.0	0.0	4,416.2	4,965.2	549.0	165.6	40%	2,271.9	7,951.7	540.4	8,492.1	25%	1,378.6	68.9	579.0	2,026.5	10,518.6
		SUBTOTAL 212 - WHB II	2,032.3	$58,689.1	$34,382.4	$94,059.7	$187,131.2	$58,689.1	$4,816.5		$100,254.7	$350,891.5	$24,090.5	$374,982.0		$61,455.1	$3,072.7	$25,811.1	$90,338.9	$465,320.9
	215.01	WASTE TREATMENT BUILDING	122.1	3,540.7	2,876.9	4,681.5	11,099.1	3,540.7	283.4	40%	5,969.3	20,892.5	1,434.7	22,327.2	25%	3,660.0	183.0	1,537.2	5,380.2	27,707.4
	215.02	VEHICLE WASH FACILITY	5.6	163.6	224.2	152.0	539.8	163.6	14.1	30%	215.3	932.8	64.0	996.8	15%	105.5	5.3	33.2	144.0	1,140.8
	215.03	DECONTAMINATION BUILDING	20.1	582.8	933.8	519.7	2,036.3	582.8	54.5	30%	802.1	3,475.7	238.3	3,714.0	15%	392.9	19.6	123.8	536.3	4,250.3
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.6	10,756.9	4,045.2	251.7	40%	6,021.5	21,075.3	1,450.6	22,525.9	25%	3,700.5	185.0	1,554.2	5,439.7	27,965.6
		SUBTOTAL 215 - OTHER	287.5	$8,332.3	$7,600.0	$8,499.8	$24,432.1	$8,332.3	$603.7		$13,008.2	$46,376.3	$3,187.6	$49,563.9		$7,858.9	$392.9	$3,248.4	$11,500.2	$61,064.1
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	2,948.2	$85,240.9	$54,171.0	$122,702.3	$262,114.2	$85,240.9	$6,632.7		$141,256.1	$495,243.9	$34,017.7	$529,261.6		$86,506.7	$4,325.3	$36,280.6	$127,112.6	$656,374.2

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 1
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.1	888.9	1,875.2	509.2	51.2	25%	608.9	3,044.5	208.6	3,253.1	10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2	25%	303.3	1,516.4	104.6	1,621.0	10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.8	568.0	803.2	1,986.0	614.8	51.4	30%	795.7	3,447.9	236.7	3,684.6	15%	390.1	19.5	122.9	532.5	4,217.1
	220.40	MAINTENANCE FACILITIES	53.0	1,536.4	1,955.9	455.8	3,948.1	1,536.4	90.4	25%	1,393.7	6,968.6	479.9	7,448.5	10%	548.5	27.4	144.0	719.9	8,168.4
	220.50	ADMIN/PERSONNEL FACILITIES	103.3	2,996.6	2,650.5	623.5	6,270.6	2,996.6	122.8	30%	2,817.0	12,207.0	843.3	13,050.3	15%	1,390.1	69.5	437.9	1,897.5	14,947.8
	220.60	MOCK-UP BUILDING	20.6	595.9	957.0	501.3	2,054.2	595.9	54.7	30%	811.4	3,516.2	241.2	3,757.4	15%	397.5	19.9	125.2	542.6	4,300.0
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.2	4,477.5	375.5	7,327.2	2,474.2	182.0	25%	2,495.9	12,479.3	857.6	13,336.9	10%	980.1	49.0	257.3	1,286.4	14,623.3
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1	25%	150.7	753.4	51.9	805.3	10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.6	222.1	3,348.0	4,009.7	439.6	133.9	30%	1,375.0	5,958.2	404.9	6,363.1	15%	667.4	33.4	210.2	911.0	7,274.1
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5	30%	451.6	1,957.0	135.1	2,092.1	15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.4	61.0	37.2	0.9	25%	24.8	123.9	8.6	132.5	10%	9.8	0.5	2.6	12.9	145.4
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6	25%	195.5	977.4	66.3	1,043.7	10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.7	2,925.2	4,046.8	1,078.9	111.3	25%	1,309.3	6,546.3	448.5	6,994.8	10%	512.6	25.6	134.6	672.8	7,667.6
	221.90	SEWAGE FACILITY	15.1	439.0	419.4	8.4	866.8	439.0	16.0	25%	330.5	1,652.3	114.3	1,766.6	10%	130.6	6.5	34.3	171.4	1,938.0
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1	30%	4,683.5	20,295.2	1,374.8	21,670.0	15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.7	0.0	5,186.5	5,210.2	23.7	194.5	25%	1,357.1	6,785.5	458.0	7,243.5	10%	523.4	26.2	137.4	687.0	7,930.5
	222.42	BATCH PLANT	10.2	296.2	0.5	1,273.0	1,569.7	296.2	47.8	25%	478.4	2,392.1	163.3	2,555.4	10%	186.6	9.3	49.0	244.9	2,800.3
4.3.2.2		TOTAL 220 - BALANCE OF PLANT	445.6	$12,922.9	$13,072.8	$30,486.9	$56,482.6	$12,922.9	$1,633.4		$19,582.3	$90,621.2	$6,197.6	$96,818.8		$8,718.5	$435.9	$2,568.8	$11,723.2	$108,542.0
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.8	159.1	35.6	348.5	153.8	7.3	30%	152.9	662.5	45.7	708.2	15%	75.3	3.8	23.7	102.8	811.0
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1,221.7	1,857.2	503.3	3,582.2	1,221.7	88.5	35%	1,712.3	6,604.7	454.0	7,058.7	20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.5	6,572.4	6,041.1	17,455.0	4,841.5	473.0	35%	7,969.3	30,738.8	2,107.0	32,845.8	20%	4,459.3	223.0	1,638.8	6,321.1	39,166.9
		TOTAL 230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8		$9,834.5	$38,006.0	$2,606.7	$40,612.7		$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0		GRAND TOTAL SURFACE FACILITIES	4,666.3	$134,997.8	$174,666.7	$165,500.7	$475,165.2	$134,997.8	$12,756.2		$213,769.7	$836,688.9	$57,374.9	$894,063.8		$117,948.3	$5,897.4	$45,526.2	$169,371.9	$1,063,435.7

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 1
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	5	8	11	15	18	19	19	19	
BUSES AT $100.0 K per YEAR	COST	$200	$500	$800	$1,100	$1,500	$1,800	$1,900	$38,000	$1,900	$47,700
	SUBTOTAL - 100	$226	$526	$826	$1,360	$1,760	$2,060	$2,160	$43,200	$2,160	$54,278
CONTINGENCY @ 20%		$45	$105	$165	$272	$352	$412	$432	$8,640	$432	$10,856
	TOTAL - 100	$271	$631	$991	$1,632	$2,112	$2,472	$2,592	$51,840	$2,592	$65,134
210 - WASTE HANDLING FACILITIES											
LABOR:	# of PEOPLE	22	58	95	133	175	213	224	224	224	
COST PER YR/ PERSON $52,700	COST	$1,159	$3,057	$5,007	$7,009	$9,223	$11,225	$11,805	$236,096	$11,805	$296,385
OPERATING SUPPLIES @ 5.0% of LABOR		$58	$153	$250	$350	$461	$561	$590	$11,805	$590	$14,819
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$3,280	$3,280	$3,280	$19,680	$19,680	$19,680	$19,680	$393,600	$19,680	$501,840
Capital Cost = 656 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$3,338	$3,433	$3,530	$20,030	$20,141	$20,241	$20,270	$405,405	$20,270	$516,659
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.3	2.3	2.3	22.5	22.5	22.5	22.5	22.5	22.5	
@ $.05/Kwhr	COST	$115	$115	$115	$1,125	$1,125	$1,125	$1,125	$22,500	$1,125	$28,470
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$125	$129	$132	$751	$755	$759	$760	$15,203	$760	$19,375
	SUBTOTAL - 210	$4,738	$6,733	$8,784	$28,916	$31,244	$33,350	$33,960	$679,203	$33,960	$860,889
CONTINGENCY @ 40%		$1,895	$2,693	$3,514	$11,566	$12,498	$13,340	$13,584	$271,681	$13,584	$344,356
	TOTAL - 210	$6,633	$9,426	$12,298	$40,482	$43,741	$46,691	$47,544	$950,885	$47,544	$1,205,244
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	49	130	211	290	390	470	510	510	510	
COST PER YR/PERSON $52,700	COST	$2,582	$6,851	$11,120	$15,283	$20,553	$24,769	$26,877	$537,540	$26,877	$672,452
OPERATING SUPPLIES @ 5.0% of LABOR		$129	$343	$556	$764	$1,028	$1,238	$1,344	$26,877	$1,344	$33,623
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$785	$785	$785	$3,140	$3,140	$3,140	$3,140	$62,800	$3,140	$80,855
Capital Cost = 157 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$914	$1,128	$1,341	$3,904	$4,168	$4,378	$4,484	$89,677	$4,484	$114,478
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.6	2.6	2.6	26	26	26	26	26	26	
@ $.05/Kwhr	COST	$130	$130	$130	$1,300	$1,300	$1,300	$1,300	$26,000	$1,300	$32,890
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$34	$42	$50	$146	$156	$164	$168	$3,363	$168	$4,293
	SUBTOTAL - 220	$3,661	$8,151	$12,641	$20,634	$26,177	$30,612	$32,829	$656,580	$32,829	$824,113
CONTINGENCY @ 30%		$1,098	$2,445	$3,792	$6,190	$7,853	$9,183	$9,849	$196,974	$9,849	$247,234
	TOTAL - 220	$4,759	$10,596	$16,433	$26,824	$34,030	$39,795	$42,678	$853,554	$42,678	$1,071,346
TOTAL ANNUAL O & M COST		$11,663	$20,654	$29,722	$68,938	$79,884	$88,959	$92,814	$1,856,279	$92,814	$2,341,724

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 1
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	11	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$1,100	$4,600	$100	$5,800	$1,000	$54,500
	SUBTOTAL - 100	$1,178	$6,394	$178	$7,750	$1,260	$63,288
CONTINGENCY @ 20%		$236	$1,279	$36	$1,550	$252	$12,658
	TOTAL - 100	$1,414	$7,673	$214	$9,300	$1,512	$75,946
210 - WASTE HANDLING FACILITIES							
LABOR:	# of PEOPLE	123	12	6		0	
COST PER YR/ PERSON $52,700	COST	$6,482	$14,545	$316	$21,344	$0	$317,728
OPERATING SUPPLIES @ 5.0% of LABOR		$324	$727	$16	$1,067	$0	$15,886
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$66	$1,509	$66	$1,640	$0	$503,480
Capital Cost = 656 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$390	$2,236	$81	$2,707	$0	$519,366
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$28,970
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$15	$84	$3	$102	$0	$19,476
	SUBTOTAL - 210	$6,906	$17,325	$421	$24,652	$0	$885,541
CONTINGENCY @ 40%		$2,763	$6,930	$168	$9,861	$0	$354,216
	TOTAL - 210	$9,669	$24,255	$589	$34,513	$0	$1,239,757
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	280	64	32		19	
COST PER YR/PERSON $52,700	COST	$14,756	$77,574	$1,686	$94,017	$10,013	$776,482
OPERATING SUPPLIES @ 5.0% of LABOR		$738	$3,879	$84	$4,701	$501	$38,824
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$785	$18,055	$785	$19,625	$1,570	$102,050
Capital Cost = 157 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,523	$21,934	$869	$24,326	$2,071	$140,874
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$49,140
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$57	$823	$33	$912	$78	$5,283
	SUBTOTAL - 220	$16,886	$112,981	$3,138	$133,005	$14,661	$971,779
CONTINGENCY @ 30%		$5,066	$33,894	$941	$39,901	$4,398	$291,534
	TOTAL - 220	$21,952	$146,875	$4,080	$172,906	$19,060	$1,263,312
TOTAL ANNUAL O & M COST		$33,034	$178,803	$4,882	$216,719	$20,572	$2,579,015

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TUFF REPOSITORY SURFACE FACILITIES
REV C DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 1
(DOLLARS IN THOUSANDS - IIIQTR88)

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST		INDIRECT COST @ %	SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10%	82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE													
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10%	1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10%	245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE													
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.5	75%	100.4	505.9	35%	177.0	10%	68.3	0.0	(0.2)	751.0
	120.70	ON SITE - DRAINAGE CONTROL															
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10%	9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10%	48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10%	1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9		$457.9	$0.0	$0.8	$5,037.0
	130.11	OFF SITE - ROADS (NEW)															
	130.13	OFF SITE - BRIDGES															
	130.21	OFF SITE - RAIL (NEW)															
	130.50	OFF SITE - UTILITIES															
	140.00	MONUMENTS															
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
4.3.1		TOTAL 100 - SITE	60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9		$457.9	$0.0	$0.8	$5,037.0
	211.02	WHB I - BUILDING/STRUCTURE	93.2	2,458.0	10.2	499.1	2,967.3	75%	1,843.5	4,810.8	35%	1,683.8	10%	649.5	714.4	(0.5)	7,858.0
	211.03	WHB I - HOT CELL EQUIPMENT		INCLUDED ABOVE													
	211.04	WHB I - UTILITIES		INCLUDED ABOVE													
	211.05	WHB I - HVAC EQUIPMENT		INCLUDED ABOVE													
	211.06	WHB I - HANDL/PACK EQUIP		INCLUDED ABOVE													
	2f1.07	WHB I - SUPPORT FACILITIES		INCLUDED ABOVE													
		SUBTOTAL 211 - WHB I	93.2	$2,458.0	$10.2	$499.1	$2,967.3		$1,843.5	$4,810.8		$1,683.8		$649.5	$714.4	($0.5)	$7,858.0
	212.02	WHB II - BUILDING/STRUCT	248.3	6,546.2	40.6	1,821.9	8,408.7	75%	4,909.6	13,318.3	35%	4,661.4	10%	1,798.0	1,977.8	(0.5)	21,755.0
	212.03	WHB II - HOT CELL EQUIP		INCLUDED ABOVE													
	212.04	WHB II - UTILITIES		INCLUDED ABOVE													
	212.05	WHB II - HVAC EQUIPMENT		INCLUDED ABOVE													
	212.06	WHB II - HANDL/PACK EQUIP		INCLUDED ABOVE													
	212.07	WHB II - SUPPORT FAC.		INCLUDED ABOVE													
		SUBTOTAL 212 - WHB II	248.3	$6,546.2	$40.6	$1,821.9	$8,408.7		$4,909.6	$13,318.3		$4,661.4		$1,798.0	$1,977.8	($0.5)	$21,755.0
	215.01	WASTE TREATMENT BUILDING	19.4	511.5	10.7	199.9	722.0	75%	383.6	1,105.6	35%	387.0	10%	149.3	164.2	(0.1)	1,806.0
	215.02	VEHICLE WASH FACILITY	0.9	25.3	0.0	0.0	25.3	75%	19.0	44.3	35%	15.5	10%	6.0	6.6	(0.4)	72.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10%	21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10%	179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	45.3	$1,195.9	$21.4	$524.9	$1,742.1		$896.9	$2,639.0		$923.7		$356.4	$391.9	($0.9)	$4,310.1
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	386.8	$10,200.0	$72.2	$2,845.9	$13,118.1		$7,650.0	$20,768.1		$7,268.9		$2,803.9	$3,084.1	($1.9)	$33,923.1

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TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 1
(DOLLARS IN THOUSANDS - IIIQTR88)

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10% 15.6	17.1	0.2	188.6
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10% 12.5	13.7	0.1	150.8
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10% 19.9	21.9	0.3	241.5
	220.40	MAINTENANCE FACILITIES	9.0	237.3	0.0	0.0	237.3	75%	178.0	415.3	35%	145.3	10% 56.1	61.7	(0.3)	678.1
	220.50	ADMIN/PERSONNEL FACILITIES	14.6	384.9	0.0	0.0	384.9	75%	288.7	673.6	35%	235.8	10% 90.9	100.0	0.5	1,100.8
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10% 25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10% 49.8	54.8	0.2	603.1
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10% 6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10% 13.1	14.4	(0.2)	158.1
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10% 17.4	19.2	(0.1)	210.9
	221.10	EXPLOSIVE MAGAZINES	0.2	5.8	0.0	0.0	5.8	75%	4.4	10.2	35%	3.6	10% 1.4	1.5	0.3	17.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10% 2.1	2.3	0.5	26.2
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10% 23.7	26.0	0.3	286.6
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10% 12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10% 28.7	31.5	0.1	346.9
	222.30	STANDARD EQUIPMENT														
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10% 10.2	11.3	0.4	124.4
4.3.2.2	TOTAL 220 - BALANCE OF PLANT		61.6	$1,624.5	$0.0	$0.0	$1,624.5		$1,234.5	$2,859.0		$1,000.7	$385.9	$424.5	$2.7	$4,672.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10% 7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10% 48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10% 168.2	185.0	0.3	2,035.2
		TOTAL 230 - SURFACE SHAFT FAC.	35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8	$223.7	$246.0	$0.2	$2,706.1
4.0		GRAND TOTAL SURFACE FACILITIES	545.2	$14,378.7	$343.7	$2,845.9	$17,568.3		$11,106.5	$28,674.8		$10,036.3	$3,871.4	$3,754.6	$1.8	$46,338.9

03-Nov-88

MRS SYSTEM STUDY - CASE 1
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
C:\LOTUS\CONT_C1 REVISION "C"

WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTEN-TION ($1000s)	CONTIN-GENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	300	$17,000	$5,100	INCLUDED	$5,100
DHLW	DHLW	12,680	$17,000	$215,560	INCLUDED	$215,560
INTACT PWR	1D	2,610	$29,000	$75,690	INCLUDED	$75,690
INTACT PWR - WESTERN UTILITIES	1D	0	$29,000	$0	INCLUDED	$0
CONSOLIDATED PWR	1A	14,979	$29,000	$434,391	INCLUDED	$434,391
INTACT BWR	1C	1,559	$29,000	$45,211	INCLUDED	$45,211
INTACT BWR - WESTERN UTILITIES	1C	0	$29,000	$0	INCLUDED	$0
CONSOLIDATED BWR	1B	5,964	$29,000	$172,956	INCLUDED	$172,956
PWR HARDWARE	1E	0	$26,000	$0	INCLUDED	$0
BWR HARDWARE	1E	994	$26,000	$25,844	INCLUDED	$25,844
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		39,314		$981,136	$0	$981,136
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		39,626		$989,872	$0	$989,872
CONTACT HANDLED WASTE						$108,000
						$1,097,872

UNDERGROUND FACILITIES - CASE 1

MRS STUDY CASES 1 AND 3
MANAGEMENT AND INTEGRATION COST ESTIMATE - UNDERGROUND FACILITIES
task:2605A138
FILE = ENG-1M3M.WK1 (RANGE=MGTINT)
06-Oct-88 02:35 PM All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$37,104			
		EMPLACEMENT		$19,521			
		CARETAKER		$3,123			
		CLOSURE					$11,686
				$59,749	$0	$0	$11,686
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$14,937	$0	$0	$2,921
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $318,029 =====>		$22,262			
		of which	85%	$18,923 is labor			
		and	15%	$3,339 is materials and equipment.			
		Labor converts to at $100k per FTE.		189.23 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			25,969,900	5,105,100	
		CONSULTANT COST			$1,428	$281	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)		DURATION		24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)		PERSONS		541	106	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.		40 PER BUS		$32,462	$6,913	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$549.88	$0.00	$25.72	$575.60
State Sales Tax	0.00	$0.00	$37.87	$33.12	$70.99
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.53	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.54	$461.19
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.92	$337.99
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$622.12
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$43.33	$2,772.89
State Sales Tax	0.00	$0.00	$71.22	$55.79	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.14
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$9.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.38	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.99	$243.68
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.64	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.69	$0.00	$13.85	$198.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.89
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	172.35	$4,772.57	$5,472.90	$3,485.47	$13,730.94
Ind. Labor & Material	56.88	$1,574.95	$0.00	$104.56	$1,679.51
State Sales Tax	0.00	$0.00	$205.23	$134.63	$339.86
QA/QC Impact	11.46	$317.38	$273.65	$179.50	$770.53
	240.69	$6,664.90	$5,951.78	$3,904.16	$16,520.84
Labor Contingency	60.17		Contractor Cost (0.15)		$2,478.13
			Contingency (0.25)		$4,749.75
Task 41024 Total	300.87				$23,748.72
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	74.79	$2,071.00	$6,840.60	$2,017.48	$10,929.08
Ind. Labor & Material	24.68	$683.43	$0.00	$60.52	$743.95
State Sales Tax	0.00	$0.00	$256.53	$77.22	$333.75
QA/QC Impact	4.97	$137.72	$342.02	$103.90	$583.64
	104.45	$2,892.15	$7,439.15	$2,259.82	$12,591.12
Labor Contingency	36.56		Contractor Cost (0.15)		$1,888.67
			Contingency (0.35)		$5,067.93
Task 41025 Total	141.01				$19,547.72
Subject 41020 Total	730.77				$76,914.21
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	3.76	$87.38	$1,764.56	$85.12	$1,937.06
Ind. Labor & Material	1.04	$28.84	$0.00	$2.55	$31.38
State Sales Tax	0.00	$0.00	$66.17	$3.29	$69.46
QA/QC Impact	0.21	$5.81	$88.23	$4.38	$98.42
	4.41	$122.03	$1,918.96	$95.34	$2,136.33
Labor Contingency	1.54		Contractor Cost (0.15)		$320.45
			Contingency (0.35)		$859.87
Task 41045 Total	5.95				$3,316.65
Subject 41040 Total	5.95				$3,316.65
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	61.90	$1,869.91	$3,327.06	$2,121.39	$7,318.36
Ind. Labor & Material	20.43	$617.07	$0.00	$63.64	$680.71
State Sales Tax	0.00	$0.00	$124.76	$81.94	$206.70
QA/QC Impact	4.12	$124.35	$166.36	$109.25	$399.96
	86.44	$2,611.33	$3,618.18	$2,376.22	$8,605.73
Labor Contingency	25.93		Contractor Cost (0.15)		$1,290.86
			Contingency (0.30)		$2,968.98
Task 41060 Total	112.37				$12,865.57
Subject 41060 Total	112.37				$12,865.57
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	61.60	$1,705.62	$3,381.54	$112.73	$5,199.89
Ind. Labor & Material	20.33	$562.85	$0.00	$3.38	$566.23
State Sales Tax	0.00	$0.00	$126.80	$4.35	$131.15
QA/QC Impact	4.10	$113.42	$169.08	$5.81	$288.31
	86.02	$2,381.89	$3,677.42	$126.27	$6,185.58
Labor Contingency	21.51		Contractor Cost (0.15)		$927.83
			Contingency (0.25)		$1,778.36
Task 41070 Total	107.53				$8,891.77
Subject 41070 Total	107.53				$8,891.77
Category 41000 Total	1139.64				$122,815.41

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.98	$0.00	$3.29	$15.27
State Sales Tax	0.00	$0.00	$227.97	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$1,982.89	$0.00	$1,982.89
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$74.36	$0.00	$74.36
QA/QC Impact	0.00	$0.00	$99.14	$0.00	$99.14
	0.00	$0.00	$2,156.39	$0.00	$2,156.39
Labor Contingency	0.00		Contractor Cost (0.15)		$323.45
			Contingency (0.35)		$867.94
Task 42030 Total	0.00				$3,347.78
Subject 42030 Total	0.00				$3,347.78
Category 42000 Total	2.09				$20,183.05
Area 40000 Total	1141.73				$142,998.46
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.75	$1,074.95
State Sales Tax	0.00	$0.00	$37.14	$6.97	$44.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$83.84	$83.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	500.98	$16,049.75	$2,167.46	$1,105.35	$19,322.56
Ind. Labor & Material	165.32	$5,296.42	$0.00	$33.16	$5,329.58
State Sales Tax	0.00	$0.00	$81.28	$42.69	$123.97
QA/QC Impact	33.32	$1,067.31	$108.38	$56.93	$1,232.62
	699.62	$22,413.48	$2,357.12	$1,238.13	$26,008.73
Labor Contingency	209.89		Contractor Cost (0.15)		$3,901.31
			Contingency (0.30)		$8,973.01
Task 51031 Total	909.51				$38,883.05
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.22
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	918.34				$39,882.56
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.78	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.64	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	10.90	$301.77	$19.68	$208.18	$529.63
Ind. Labor & Material	3.60	$99.58	$0.00	$6.25	$105.83
State Sales Tax	0.00	$0.00	$0.74	$8.04	$8.78
QA/QC Impact	0.72	$20.07	$0.98	$10.72	$31.77
	15.22	$421.42	$21.40	$233.19	$676.01
Labor Contingency	4.57		Contractor Cost (0.15)		$101.40
			Contingency (0.30)		$233.22
Task 51050 Total	19.78				$1,010.63
Subject 51050 Total	19.78				$1,010.63
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	64.41	$1,783.54	$1,457.52	$539.73	$3,780.79
Ind. Labor & Material	21.26	$588.57	$0.00	$16.19	$604.76
State Sales Tax	0.00	$0.00	$54.65	$20.85	$75.50
QA/QC Impact	4.28	$118.61	$72.88	$27.80	$219.29
	89.95	$2,490.72	$1,585.05	$604.57	$4,680.34
Labor Contingency	26.98		Contractor Cost (0.15)		$702.05
			Contingency (0.30)		$1,614.71
Task 51060 Total	116.93				$6,997.10
Subject 51060 Total	116.93				$6,997.10
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.91	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.49
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$51.97
			Contingency (0.25)		$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.26
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.69	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.65
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1473.78				$77,324.06
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$409.64	$0.00	$20.10	$430.04
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.84	$31.63	$0.00	$0.89	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.52
			Contingency (0.30)		$56.39
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.99
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1686.51				$100,034.73

* TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT * 3523.64 x 10^3 man-hrs $318,029.45

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$116.85	$2,979.45
State Sales Tax	0.00	$0.00	$25.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.34
			Contingency (0.30)		$5,934.78
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$36.77	$529.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.92	$200.01	$0.00	$14.61	$214.62
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$127.56	$184.89
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68		Contractor Cost (0.15)		$1,506.33
			Contingency (0.25)		$2,887.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.75	$3,923.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86		Contractor Cost (0.15)		$4,910.56
			Contingency (0.25)		$9,411.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87		Contractor Cost (0.15)		$2,393.30
			Contingency (0.25)		$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	1792.65	$49,639.36	$11,184.96	$36,252.30	$97,076.62
Ind. Labor & Material	591.58	$16,380.99	$0.00	$1,087.57	$17,468.56
State Sales Tax	0.00	$0.00	$419.44	$1,400.25	$1,819.69
QA/QC Impact	119.21	$3,301.02	$559.25	$1,866.99	$5,727.26
	2503.44	$69,321.37	$12,163.65	$40,607.11	$122,092.13
Labor Contingency	625.86		Contractor Cost (0.15)		$18,313.81
			Contingency (0.25)		$32,101.49
Task 41024 Total	3129.30				$175,507.43
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1246.06	$34,502.11	$29,506.36	$33,610.42	$97,618.89
Ind. Labor & Material	417.20	$11,385.70	$0.00	$1,008.31	$12,394.01
State Sales Tax	0.00	$0.00	$1,106.49	$1,298.20	$2,404.69
QA/QC Impact	82.86	$2,294.39	$1,475.31	$1,730.94	$5,500.64
	1740.12	$48,182.20	$32,088.16	$37,647.87	$117,918.23
Labor Contingency	609.04		Contractor Cost (0.15)		$17,687.73
			Contingency (0.35)		$47,462.09
Task 41025 Total	2349.16				$183,068.05
Subject 41020 Total	6685.52				$443,006.60
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33		Contractor Cost (0.15)		$8,851.18
			Contingency (0.35)		$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	63.57	$1,760.12	$1,495.22	$1,750.75	$5,006.09
Ind. Labor & Material	20.98	$580.84	$0.00	$52.52	$633.36
State Sales Tax	0.00	$0.00	$56.07	$67.62	$123.69
QA/QC Impact	4.23	$117.05	$74.76	$90.16	$281.97
	88.77	$2,458.01	$1,626.05	$1,961.05	$6,045.11
Labor Contingency	31.07		Contractor Cost (0.15)		$906.76
			Contingency (0.35)		$2,433.12
Task 41045 Total	119.84				$9,385.02
Subject 41040 Total	119.84				$9,385.02
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	170.18	$5,127.43	$9,718.69	$3,067.73	$17,913.85
Ind. Labor & Material	56.16	$1,692.05	$0.00	$92.03	$1,784.08

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$364.45	$118.49	$482.94
QA/QC Impact	11.32	$340.97	$485.94	$157.99	$984.90
	237.65	$7,160.45	$10,569.08	$3,436.24	$21,165.77
Labor Contingency	71.30		Contractor Cost (0.15)		$3,174.87
			Contingency (0.30)		$7,302.19
Task 41060 Total	308.95				$31,642.83
Subject 41060 Total	308.95				$31,642.83
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	720.00	$19,937.28	$6,786.00	$9,501.84	$36,225.12
Ind. Labor & Material	237.60	$6,579.30	$0.00	$285.06	$6,864.36
State Sales Tax	0.00	$0.00	$254.48	$367.01	$621.49
QA/QC Impact	47.88	$1,325.83	$339.30	$489.34	$2,154.47
	1005.48	$27,842.41	$7,379.78	$10,643.25	$45,865.44
Labor Contingency	251.37		Contractor Cost (0.15)		$6,879.81
			Contingency (0.25)		$13,186.31
Task 41070 Total	1256.85				$65,931.56
Subject 41070 Total	1256.85				$65,931.56
Category 41000 Total	9521.87				$641,575.65
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	278.30	$9,111.49	$32,801.54	$27,576.99	$69,490.02
Ind. Labor & Material	91.84	$3,006.79	$0.00	$827.31	$3,834.10
State Sales Tax	0.00	$0.00	$1,230.06	$1,065.16	$2,295.22
QA/QC Impact	18.51	$605.91	$1,640.08	$1,420.22	$3,666.21
	388.64	$12,724.19	$35,671.68	$30,889.68	$79,285.55
Labor Contingency	136.02		Contractor Cost (0.15)		$11,892.83
			Contingency (0.35)		$31,912.43
Task 42010 Total	524.67				$123,090.81
Subject 42010 Total	524.67				$123,090.81
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacemept					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	14.34	$469.51	$1,690.24	$1,421.02	$3,580.77
Ind. Labor & Material	4.73	$154.94	$0.00	$42.63	$197.57
State Sales Tax	0.00	$0.00	$65.38	$54.89	$118.27
QA/QC Impact	0.95	$31.22	$84.51	$73.18	$188.91
	20.03	$655.67	$1,838.13	$1,591.72	$4,085.52
Labor Contingency	7.01		Contractor Cost (0.15)		$612.84
			Contingency (0.35)		$1,644.42
Task 42030 Total	27.04				$6,342.78
Subject 42030 Total	27.04				$6,342.78
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.92	$95.60	$0.00	$0.00	$95.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	833.93				$193,378.51
Area 40000 Total	10355.79				$834,954.16
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	222.37	$6,157.78	$0.00	$41.33	$6,199.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.56
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3138.52	$100,722.58	$4,300.61	$6,403.89	$111,427.08
Ind. Labor & Material	1035.71	$33,238.45	$0.00	$192.12	$33,430.57
State Sales Tax	0.00	$0.00	$161.28	$247.35	$408.63
QA/QC Impact	208.71	$6,698.05	$215.03	$329.80	$7,242.88

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	4382.95	$140,659.08	$4,676.92	$7,173.16	$152,509.16
Labor Contingency	1314.89		Contractor Cost (0.15)		$22,876.37
			Contingency (0.30)		$52,615.66
Task 51031 Total	5697.84				$228,001.19
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$48.05	$130.24	$178.29
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.26
Labor Contingency	686.05		Contractor Cost (0.15)		$11,804.70
			Contingency (0.30)		$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	8670.74				$345,654.66
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.49	$32.65	$47.14
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
Labor Contingency	86.84		Contractor Cost (0.15)		$1,647.73
			Contingency (0.25)		$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	283.06	$7,838.05	$1,378.01	$2,905.45	$12,121.51
Ind. Labor & Material	93.41	$2,586.56	$0.00	$87.16	$2,673.72
State Sales Tax	0.00	$0.00	$51.68	$112.22	$163.90
QA/QC Impact	18.82	$521.23	$68.90	$149.63	$739.76
	395.30	$10,945.84	$1,498.59	$3,254.46	$15,698.89
Labor Contingency	118.59		Contractor Cost (0.15)		$2,354.84
			Contingency (0.30)		$5,416.12
Task 51050 Total	513.88				$23,469.85
Subject 51050 Total	513.88				$23,469.85
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	367.44	$10,174.44	$6,507.66	$2,816.81	$19,498.91
Ind. Labor & Material	121.26	$3,357.57	$0.00	$84.50	$3,442.07
State Sales Tax	0.00	$0.00	$24.04	$108.80	$355.84
QA/QC Impact	24.43	$676.60	$325.38	$145.07	$1,147.05
	513.13	$14,208.61	$7,077.08	$3,155.18	$24,440.87
Labor Contingency	153.94		Contractor Cost (0.15)		$3,666.14
			Contingency (0.30)		$8,432.10
Task 51060 Total	667.07				$36,539.11
Subject 51060 Total	667.07				$36,539.11
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$94.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
Labor Contingency	9.79		Contractor Cost (0.15)		$755.49
			Contingency (0.25)		$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
Labor Contingency	0.54		Contractor Cost (0.15)		$92.60
			Contingency (0.25)		$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
Labor Contingency	0.95		Contractor Cost (0.15)		$426.70
			Contingency (0.25)		$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT		LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)			
		474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency		142.47			Contractor Cost (0.15)	$3,063.79
					Contingency (0.30)	$7,046.72
Task	51100 Total	617.37				$30,535.76
Subject	51100 Total	617.37				$30,535.76
51110 Control Room Facility						
51110 Control Room Facility						
Direct Cost		337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material		111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax		0.00	$0.00	$0.18	$26.84	$27.02
QA/QC Impact		22.42	$621.43	$0.24	$35.79	$657.46
		470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency		117.73			Contractor Cost (0.15)	$2,075.07
					Contingency (0.25)	$3,977.73
Task	51110 Total	588.63				$19,886.13
Subject	51110 Total	588.63				$19,886.13
Category	51000 Total	12724.55				$527,787.09
52000 UTILITIES						
52010 Electrical						
52010 Electrical						
Direct Cost		107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material		35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax		0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact		7.17	$243.90	$354.25	$70.44	$668.59
		150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency		37.64			Contractor Cost (0.15)	$2,153.85
					Contingency (0.25)	$4,128.19
Task	52010 Total	188.22				$20,640.99
Subject	52010 Total	188.22				$20,640.99
52020 Communications						
52020 Communications						
Direct Cost		20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material		6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax		0.00	$0.00	$0.64	$2.92	$3.56
QA/QC Impact		1.34	$45.75	$0.86	$3.90	$50.51
		28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency		8.46			Contractor Cost (0.15)	$159.64
					Contingency (0.30)	$367.17
Task	52020 Total	36.65				$1,591.05
Subject	52020 Total	36.65				$1,591.05
52040 Chilled Water						
52040 Chilled Water						
Direct Cost		39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material		13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax		0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact		2.65	$73.49	$50.03	$44.16	$167.68
		55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency		16.72			Contractor Cost (0.15)	$538.81
					Contingency (0.30)	$1,239.27
Task	52040 Total	72.46				$5,370.14
Subject	52040 Total	72.46				$5,370.14
52050 Water						
52050 Water						
Direct Cost		14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material		4.71	$130.42	$0.00	$11.14	$141.56
State Sales Tax		0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact		0.95	$26.28	$1.97	$19.13	$47.38
		19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency		5.98			Contractor Cost (0.15)	$151.61
					Contingency (0.30)	$348.70
Task	52050 Total	25.92				$1,511.03
Subject	52050 Total	25.92				$1,511.03
Category	52000 Total	323.25				$29,113.21
53000 MONITORING						
53000 MONITORING						
53000 MONITORING						
Direct Cost		962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material		317.57	$10,365.32	$0.00	$643.04	$10,008.36
State Sales Tax		0.00	$0.00	$300.65	$622.16	$922.81
QA/QC Impact		64.00	$2,088.77	$400.88	$932.21	$3,421.86
		1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency		470.37			Contractor Cost (0.15)	$10,928.80
					Contingency (0.35)	$29,325.62
Task	53000 Total	1814.27				$113,113.13
Subject	53000 Total	1814.27				$113,113.13
Category	53000 Total	1814.27				$113,113.13
Area	50000 Total	14862.08				$670,013.43

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 25969.92 x 10^3 man-hrs $1,546,437.97

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$67.02	$1,617.60
State Sales Tax	0.00	$0.00	$21.68	$82.42	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$39.83	$574.15
State Sales Tax	0.00	$0.00	$12.25	$51.20	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.25
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.13	$232.80
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$248.85
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.86	$216.67	$0.00	$18.15	$234.82
State Sales Tax	0.00	$0.00	$5.03	$20.79	$25.82
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	416.00	$11,519.04	$3,642.21	$7,832.76	$22,994.01
Ind. Labor & Material	137.28	$3,801.28	$0.00	$235.98	$4,037.26
State Sales Tax	0.00	$0.00	$136.38	$202.14	$338.52
QA/QC Impact	27.66	$766.02	$182.11	$403.39	$1,351.52
	580.94	$16,086.34	$3,960.90	$8,773.67	$28,820.91
Labor Contingency	145.24		Contractor Cost (0.15)		$4,323.14
			Contingency (0.25)		$8,287.02
Task 41070 Total	726.18				$41,430.07
Subject 41070 Total	726.18				$41,430.07
Category 41000 Total	726.18				$41,430.07
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	8.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.53
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	749.85				$43,881.92
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.27	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$36.58	$57.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.72	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.82	$22.03
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.25
			Contingency (0.30)		$2,080.34
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency	10.17		Contractor Cost (0.15)		$176.84
			Contingency (0.25)		$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	101.96	$2,823.30	$1,026.22	$678.79	$4,528.31
Ind. Labor & Material	33.65	$931.69	$0.00	$20.36	$952.05
State Sales Tax	0.00	$0.00	$38.48	$26.22	$64.70
QA/QC Impact	6.78	$187.75	$51.32	$34.96	$274.03
	142.39	$3,942.74	$1,116.02	$760.33	$5,819.09
Labor Contingency	42.72		Contractor Cost (0.15)		$872.87
			Contingency (0.30)		$2,007.56
Task 51050 Total	185.10				$8,699.55
Subject 51050 Total	185.10				$8,699.55
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$35.53	$313.12
State Sales Tax	0.00	$0.00	$101.90	$45.75	$147.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency	10.60		Contractor Cost (0.15)		$818.45
			Contingency (0.25)		$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.99	$0.00	$0.14	$9.13
State Sales Tax	0.00	$0.00	$12.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency	0.29		Contractor Cost (0.15)		$62.26
			Contingency (0.25)		$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency	1.03		Contractor Cost (0.15)		$182.30
			Contingency (0.25)		$349.40
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.09	$2,319.58	$0.00	$51.70	$2,371.29
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency	88.99		Contractor Cost (0.15)		$1,956.04
			Contingency (0.30)		$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency	127.54		Contractor Cost (0.15)		$2,248.00
			Contingency (0.25)		$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2688.47				$114,249.13
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.06	$22.44	$136.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency	18.15		Contractor Cost (0.15)		$964.92
			Contingency (0.25)		$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	9.82	$337.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05	.....	.....	.....	$2,295.64
Subject 52020 Total	54.05	. . . . .	. . . . .	. . . . .	$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,908.27
Task 52040 Total	94.40	.....	.....	.....	$12,602.50
Subject 52040 Total	94.40	. . . . .	. . . . .	. . . . .	$12,602.50
Category 52000 Total	239.23	- - - - -	- - - - -	- - - - -	$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.39	$0.00	$241.67	$5,259.06
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42	.....	.....	.....	$56,637.34
Subject 53000 Total	873.42	. . . . .	. . . . .	. . . . .	$56,637.34
Category 53000 Total	873.42	- - - - -	- - - - -	- - - - -	$56,637.34
Area 50000 Total	3801.12	= = = = =	= = = = =	= = = = =	$195,031.76

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COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	99.36	$3,252.96	$250.13	$1,460.61	$4,963.70
Ind. Labor & Material	32.79	$1,073.48	$0.00	$43.82	$1,117.30
State Sales Tax	0.00	$0.00	$9.38	$56.42	$65.80
QA/QC Impact	6.61	$216.32	$12.51	$75.22	$304.05
	138.76	$4,542.76	$272.02	$1,636.07	$6,450.85
Labor Contingency	41.63		Contractor Cost (0.15)		$967.64
			Contingency (0.30)		$2,225.55
Task 23011 Total	180.38				$9,644.04
Subject 23010 Total	180.38				$9,644.04
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.51		Contractor Cost (0.15)		$13.58
			Contingency (0.30)		$31.23
Task 23085 Total	2.19				$135.31
Subject 23080 Total	2.19				$135.31
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.42		Contractor Cost (0.15)		$13.58
			Contingency (0.25)		$26.02
Task 23105 Total	2.11				$130.10
Subject 23100 Total	2.11				$130.10
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.07	$35.08	$5.63	$22.62	$63.33
Ind. Labor & Material	0.35	$11.58	$0.00	$0.68	$12.26
State Sales Tax	0.00	$0.00	$0.21	$0.87	$1.08
QA/QC Impact	0.07	$2.33	$0.28	$1.17	$3.78
	1.50	$48.99	$6.12	$25.34	$80.45
Labor Contingency	0.37		Contractor Cost (0.15)		$12.07
			Contingency (0.25)		$23.13
Task 23115 Total	1.87				$115.65
Subject 23110 Total	1.87				$115.65
Category 23000 Total	186.55				$10,025.10
Area 20000 Total	186.55				$10,025.10
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	15.18	$420.35	$86.18	$344.71	$851.24
Ind. Labor & Material	5.01	$138.72	$0.00	$10.34	$149.06
State Sales Tax	0.00	$0.00	$3.23	$13.31	$16.54
QA/QC Impact	1.01	$27.95	$4.31	$17.75	$50.01
	21.20	$587.02	$93.72	$386.11	$1,066.85
Labor Contingency	6.36		Contractor Cost (0.15)		$160.03
			Contingency (0.30)		$368.07
Task 30010 Total	27.56				$1,594.95
Subject 30010 Total	27.56				$1,594.95
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	8.22	$227.53	$46.66	$186.65	$460.84
Ind. Labor & Material	2.71	$75.08	$0.00	$5.60	$80.68
State Sales Tax	0.00	$0.00	$1.75	$7.21	$8.96
QA/QC Impact	0.55	$15.13	$2.33	$9.61	$27.07
	11.48	$317.74	$50.74	$209.07	$577.55
Labor Contingency	3.44		Contractor Cost (0.15)		$86.63
			Contingency (0.30)		$199.25
Task 30080 Total	14.92				$863.43
Subject 30080 Total	14.92				$863.43
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.10	$113.64	$23.29	$93.18	$230.11
Ind. Labor & Material	1.35	$37.50	$0.00	$2.80	$40.30
State Sales Tax	0.00	$0.00	$0.87	$3.60	$4.47
QA/QC Impact	0.27	$7.56	$1.16	$4.80	$13.52
	5.73	$158.70	$25.32	$104.38	$288.40
Labor Contingency	1.43		Contractor Cost (0.15)		$43.27
			Contingency (0.25)		$82.93
Task 30106 Total	7.16				$414.60
Subject 30100 Total	7.16				$414.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	3.65	$101.01	$20.71	$82.83	$204.55
Ind. Labor & Material	1.20	$33.33	$0.00	$2.48	$35.81
State Sales Tax	0.00	$0.00	$0.78	$3.20	$3.98
QA/QC Impact	0.24	$6.72	$1.04	$4.27	$12.03
	5.09	$141.06	$22.53	$92.78	$256.37
Labor Contingency	1.27		Contractor Cost (0.15)		$38.45
			Contingency (0.25)		$73.72
Task 30116 Total	6.37				$368.54
Subject 30110 Total	6.37				$368.54
Category 30000 Total	56.01				$3,241.52
Area 30000 Total	56.01				$3,241.52
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	162.00	$4,485.60	$2,282.85	$637.20	$7,405.65
Ind. Labor & Material	53.46	$1,480.25	$0.00	$176.12	$1,656.37
State Sales Tax	0.00	$0.00	$85.61	$24.61	$110.22
QA/QC Impact	10.77	$298.29	$114.14	$32.82	$445.25
	226.23	$6,264.14	$2,482.60	$713.75	$9,460.49
Labor Contingency	56.56		Contractor Cost (0.15)		$1,419.08
			Contingency (0.25)		$2,719.79
Task 41070 Total	282.79				$13,599.47
Subject 41070 Total	282.79				$13,599.47
Category 41000 Total	282.79				$13,599.47
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$6.83	$222.88
State Sales Tax	0.00	$0.00	$24.75	$8.79	$33.54
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33		Contractor Cost (0.15)		$11.20
			Contingency (0.40)		$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	610.18	$17,067.67	$15,606.11	$9,658.09	$42,331.87
Ind. Labor & Material	201.36	$5,632.33	$0.00	$288.74	$5,922.07
State Sales Tax	0.00	$0.00	$585.22	$373.04	$958.26
QA/QC Impact	40.58	$1,135.00	$780.31	$497.39	$2,412.70
	852.11	$23,835.00	$16,971.64	$10,818.26	$51,624.90
Labor Contingency	340.84		Contractor Cost (0.15)		$7,743.74
			Contingency (0.40)		$23,747.45
Task 43300 Total	1192.96				$83,116.09
Subject 43300 Total	1192.96				$83,116.09
Category 43000 Total	1395.03				$94,092.91
Area 40000 Total	1677.82				$107,692.38
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	180.35	$4,994.18	$724.73	$370.64	$6,089.55
Ind. Labor & Material	59.51	$1,648.08	$0.00	$11.12	$1,659.20
State Sales Tax	0.00	$0.00	$27.18	$14.32	$41.50
QA/QC Impact	11.99	$332.11	$36.24	$19.09	$387.44
	251.86	$6,974.37	$788.15	$415.17	$8,177.69
Labor Contingency	62.96		Contractor Cost (0.15)		$1,226.66
			Contingency (0.25)		$2,351.09
Task 51011 Total	314.82				$11,755.44
Subject 51010 Total	314.82				$11,755.44
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	291.47	$9,343.50	$793.81	$644.80	$10,782.11
Ind. Labor & Material	96.19	$3,083.36	$0.00	$19.34	$3,102.70
State Sales Tax	0.00	$0.00	$29.77	$24.91	$54.68
QA/QC Impact	19.38	$621.34	$39.69	$33.21	$694.24
	407.04	$13,048.20	$863.27	$722.26	$14,633.73
Labor Contingency	122.11		Contractor Cost (0.15)		$2,195.07
			Contingency (0.30)		$5,048.63
Task 51031 Total	529.16				$21,877.43
Subject 51030 Total	529.16				$21,877.43
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	92.43	$2,559.53	$153.95	$340.84	$3,054.32
Ind. Labor & Material	30.50	$844.64	$0.00	$10.23	$854.87
State Sales Tax	0.00	$0.00	$5.78	$13.17	$18.95
QA/QC Impact	6.15	$170.21	$7.70	$17.55	$195.46
	129.09	$3,574.38	$167.43	$381.79	$4,123.60
Labor Contingency	32.27		Contractor Cost (0.15)		$618.54
			Contingency (0.25)		$1,185.54
Task 51040 Total	161.36				$5,927.68
Subject 51040 Total	161.36				$5,927.68
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	149.96	$4,152.46	$4,239.96	$3,155.52	$11,547.94
Ind. Labor & Material	49.49	$1,370.31	$0.00	$54.67	$1,424.98
State Sales Tax	0.00	$0.00	$158.99	$121.88	$280.87
QA/QC Impact	9.97	$276.14	$212.00	$162.51	$650.65
	209.42	$5,798.91	$4,610.95	$3,534.58	$13,944.44
Labor Contingency	62.83		Contractor Cost (0.15)		$2,091.67
			Contingency (0.30)		$4,810.84
Task 51050 Total	272.25				$20,846.95
Subject 51050 Total	272.25				$20,846.95
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	10.51	$291.18	$940.56	$409.97	$1,641.71
Ind. Labor & Material	3.47	$96.09	$0.00	$12.30	$108.39
State Sales Tax	0.00	$0.00	$35.28	$15.84	$51.12
QA/QC Impact	0.70	$19.36	$47.02	$21.11	$87.49
	14.68	$406.63	$1,022.86	$459.22	$1,888.71
Labor Contingency	3.67		Contractor Cost (0.15)		$283.31
			Contingency (0.25)		$543.00
Task 51070 Total	18.35				$2,715.02
Subject 51070 Total	18.35				$2,715.02
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.58	$18.86	$185.29	$3.28	$207.43
Ind. Labor & Material	0.19	$6.22	$0.00	$0.10	$6.32
State Sales Tax	0.00	$0.00	$6.95	$0.13	$7.08
QA/QC Impact	0.04	$1.25	$9.27	$0.17	$10.69

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.80	$26.33	$201.51	$3.68	$231.52
Labor Contingency	0.20		Contractor Cost (0.15)		$34.72
			Contingency (0.25)		$66.56
Task 51080 Total	1.01				$332.80
Subject 51080 Total	1.01				$332.80
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.51	$17.46	$820.67	$101.95	$940.08
Ind. Labor & Material	0.17	$5.76	$0.00	$3.06	$8.82
State Sales Tax	0.00	$0.00	$30.78	$3.94	$34.72
QA/QC Impact	0.03	$1.16	$41.03	$5.25	$47.44
	0.72	$24.38	$892.48	$114.20	$1,031.06
Labor Contingency	0.18		Contractor Cost (0.15)		$154.66
			Contingency (0.25)		$296.43
Task 51090 Total	0.89				$1,482.15
Subject 51090 Total	0.89				$1,482.15
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	117.76	$3,868.51	$705.29	$719.47	$5,293.27
Ind. Labor & Material	38.86	$1,276.61	$0.00	$21.58	$1,298.19
State Sales Tax	0.00	$0.00	$26.45	$27.79	$54.24
QA/QC Impact	7.83	$257.26	$35.26	$37.05	$329.57
	164.45	$5,402.38	$767.00	$805.89	$6,975.27
Labor Contingency	49.34		Contractor Cost (0.15)		$1,046.30
			Contingency (0.30)		$2,406.47
Task 51100 Total	213.79				$10,428.04
Subject 51100 Total	213.79				$10,428.04
Category 51000 Total	1511.62				$75,365.51
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	37.20	$1,267.40	$5,120.52	$265.88	$6,653.80
Ind. Labor & Material	12.28	$418.24	$0.00	$7.98	$426.22
State Sales Tax	0.00	$0.00	$192.02	$10.27	$202.29
QA/QC Impact	2.47	$84.28	$256.03	$13.69	$354.00
	51.95	$1,769.92	$5,568.57	$297.82	$7,636.31
Labor Contingency	12.99		Contractor Cost (0.15)		$1,145.44
			Contingency (0.25)		$2,195.45
Task 52010 Total	64.94				$10,977.20
Subject 52010 Total	64.94				$10,977.20
52020 Communications					
52020 Communications					
Direct Cost	5.33	$181.71	$2.58	$16.53	$200.82
Ind. Labor & Material	1.76	$59.96	$0.00	$0.50	$60.46
State Sales Tax	0.00	$0.00	$0.10	$0.64	$0.74
QA/QC Impact	0.35	$12.08	$0.13	$0.85	$13.06
	7.45	$253.75	$2.81	$18.52	$275.08
Labor Contingency	2.23		Contractor Cost (0.15)		$41.26
			Contingency (0.30)		$94.91
Task 52020 Total	9.68				$411.25
Subject 52020 Total	9.68				$411.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	135.22	$3,744.02	$14,637.55	$6,959.17	$25,340.74
Ind. Labor & Material	44.62	$1,235.23	$0.00	$208.78	$1,444.31
State Sales Tax	0.00	$0.00	$548.91	$268.80	$817.71
QA/QC Impact	8.99	$248.98	$731.87	$358.40	$1,339.25
	188.83	$5,228.53	$15,918.33	$7,795.15	$28,942.01
Labor Contingency	56.65		Contractor Cost (0.15)		$4,341.31
			Contingency (0.30)		$9,985.00
Task 52040 Total	245.48				$43,268.32
Subject 52040 Total	245.48				$43,268.32
Category 52000 Total	320.10				$54,656.77
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	129.04	$4,186.11	$1,233.76	$2,788.50	$8,208.37
Ind. Labor & Material	42.58	$1,381.42	$0.00	$83.66	$1,465.08
State Sales Tax	0.00	$0.00	$46.26	$107.71	$153.97
QA/QC Impact	8.58	$278.38	$61.69	$143.61	$483.68
	180.21	$5,845.91	$1,341.71	$3,123.48	$10,311.10
Labor Contingency	63.07		Contractor Cost (0.15)		$1,546.67
			Contingency (0.35)		$4,150.21
Task 53000 Total	243.28				$16,007.98
Subject 53000 Total	243.28				$16,007.98
Category 53000 Total	243.28				$16,007.98
Area 50000 Total	2075.00				$146,030.26

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 3995.38 x 10^3 man-hrs $266,989.26

Case 2

Contents

Summary Cost Matrix (Table 1)

Surface Facility Capital Costs

Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

Underground Facilities, Project Phase 1 (Capital Costs - Engineering and Construction)

Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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REVISION "D"

TABLE 1. MRS SYSTEMS STUDY - CASE 2 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$285.55	$27.34	$26.52	$53.86	$16.57	$6.87	$23.43	$362.84
	1000	SUPPORT CONTRACTOR	$44.11	$0.00	$0.00	$0.00	$3.31	$0.90	$4.21	$48.32
	1010	Surface	$28.18			$0.00		$0.90	$0.90	
	1020	Subsurface	$15.93			$0.00	$3.31		$3.31	
	2000	ARCHITECT-ENGINEER	$176.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26	$3.58	$16.84	$193.28
	2010	Surface	$112.73	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$63.71	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26		$13.26	
	3000	CONSTRUCTION MANAGEMENT	$63.99	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$66.38
	3010	Surface	$40.79	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$23.20			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.34	$0.52	$3.86			$0.00	$3.86
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$96.86	$16.29	$113.15	$1.51	$39.85	$41.36	$332.52
	11000	EMPLOYEE TRANSPORTATION		$88.97	$13.95	$102.92	$1.20		$1.20	$104.12
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$426.37	$1,800.07	$221.57	$2,021.64	$43.74	$34.17	$77.91	$2,525.93
4.3.2.1	21000	WASTE HANDLING FACILITY	$289.76	$776.38	$33.53	$809.91	XXXXXXXXXX	$26.79	$26.79	$1,126.46
	21100	Waste Handling Building 1:	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	$0.00	
4.3.2.1.2	21102	Building/Structures	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$0.00			$0.00	XXXXXXXXXX		$0.00	

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REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 2 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$243.38	$0.00	$0.00	$0.00	XXXXXXXXXXX	$22.47	$22.47	
4.3.2.1.9	21202	Building/Structures	$120.16			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$29.59			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$18.19			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$11.24			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$57.37			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$6.83			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$46.38	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.32	$4.32	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.89			$0.00	XXXXXXXXXXX	$1.81	$1.81	
	21502	Vehicle Wash Facility	$0.93			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.48			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$89.19	$996.92	$172.57	$1,169.49	$32.38	$4.67	$37.05	$1,295.73
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.03		$19.03	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.60			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$11.13			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$11.36	$2.71	$14.07	$103.74
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$10.93	$0.67	$11.60	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04	$10.93		$10.93	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 2 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.15	$2.04	$2.19	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.15		$0.15	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.15	$0.00	$0.15	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.15		$0.15	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.13		$0.13	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.68	XXXXXXXXXXX	$3.68	$99.87
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.81	XXXXXXXXXXX	$1.81	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.98	XXXXXXXXXXX	$0.98	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXX	$0.47	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXX	$0.47	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXX	$0.42	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXX	$0.42	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$151.22	$961.82	$49.47	$1,011.29	$122.63	XXXXXXXXXXX	$122.63	$1,285.14
4.3.4.1	41000	DEVELOPMENT	$130.46	$740.92	$47.02	$787.95	$15.44	XXXXXXXXXXX	$15.44	$933.84
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$84.55	$538.73	XXXXXXXXXXX	$538.73	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXX	$14.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXX	$47.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXX	$22.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41024	Emplacement Drifts	$28.31	$223.24	XXXXXXXXXXX	$223.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$22.62	$231.06	XXXXXXXXXXX	$231.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41060	Excavated Material Handling	$13.02	$33.62	$0.00	$33.62	$0.00	XXXXXXXXXXX	$0.00	
	41070	General Maintenance	$9.20	$74.80	$47.02	$121.83	$15.44	XXXXXXXXXXX	$15.44	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.76	$220.90	$2.45	$223.35	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$244.11
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$155.48	$0.00	$155.48	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.93	$1.47	$0.00	$1.47	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	

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REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 2 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$107.19	XXXXXXXXXXXX	$107.19	$107.19
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$4.98	XXXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$3.04	XXXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$1.69	XXXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.59	XXXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.56	XXXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.12	XXXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$96.21	XXXXXXXXXXXX	$96.21	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$105.26	$728.53	$197.29	$925.82	$164.81	XXXXXXXXXXXX	$164.81	$1,195.90
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$82.55	$586.30	$116.51	$702.81	$85.75	XXXXXXXXXXXX	$85.75	$871.11
4.3.5.1.1	51010	Material Support, Receiving/Warehousing	$12.96	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXXX	$13.32	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXXX	$13.32	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$43.12	$389.14	$33.44	$422.58	$24.79	XXXXXXXXXXXX	$24.79	
	51031	Development Area	$42.12	$271.49	$24.42	$295.91	$24.79	XXXXXXXXXXXX	$24.79	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$6.64	XXXXXXXXXXXX	$6.64	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.23	$29.18	$10.96	$40.15	$24.04	XXXXXXXXXXXX	$24.04	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$8.77	$45.85	$0.00	$45.85	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.7	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$3.08	XXXXXXXXXXXX	$3.08	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.38	XXXXXXXXXXXX	$0.38	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.68	XXXXXXXXXXXX	$1.68	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$11.82	XXXXXXXXXXXX	$11.82	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$60.92	XXXXXXXXXXXX	$60.92	$124.20
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$12.39	XXXXXXXXXXXX	$12.39	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.46	XXXXXXXXXXXX	$0.46	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$48.07	XXXXXXXXXXXX	$48.07	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$18.14	XXXXXXXXXXXX	$18.14	$200.59
		TOTAL REPOSITORY	$1,211.99	$3,629.31	$527.07	$4,156.38	$352.94	$80.89	$433.83	$5,802.20
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXXX	$1,275.36	$8.74	$1,284.10	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1,284.10
	61000	SPENT FUEL	XXXXXXXXXXXXXXX	$983.32	$0.00	$983.32	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$983.32
	61010	Intact PWR	XXXXXXXXXXXXXXX	$78.86		$78.86	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXXX	$904.46		$904.46	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXXX	$215.56		$215.56	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$215.56
	63000	OTHER WASTE	XXXXXXXXXXXXXXX	$76.48	$8.74	$85.22	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$85.22
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXXX	$5.10		$5.10	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXXX	$65.00		$65.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	99999	TOTAL REPOSITORY, with EMPLACEMENT CONTAINERS	$1,211.99	$4,904.67	$535.81	$5,440.48	$352.94	$80.89	$433.83	$7,086.30

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 2
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.5	2,383.5	0.0	3,021.0	637.5	89.4	25%	937.0	4,684.9	320.1	5,005.0	10%	365.9	18.3	96.1	480.3	5,485.3
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9	25%	588.1	2,940.6	200.6	3,141.2	10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0	25%	79.4	396.8	27.2	424.0	10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.1	0.0	0.0	822.1	822.1	0.0	20%	328.8	1,973.0	138.1	2,111.1	5%	82.2	4.1	17.3	103.6	2,214.7
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0	20%	696.1	4,176.5	292.4	4,468.9	5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3	20%	36.5	218.8	15.2	234.0	5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0	20%	143.5	860.9	60.3	921.2	5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.9	448.4	0.0	697.3	248.9	16.8	20%	192.6	1,155.6	79.5	1,235.1	5%	47.3	2.4	9.9	59.6	1,294.7
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,327.9	9,219.8	2,076.1	267.9	30%	3,469.1	15,032.9	1,027.9	16,060.8	15%	1,694.4	84.7	533.7	2,312.8	18,373.6
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.4	0.0	41.9	16.5	1.0	20%	11.9	71.3	4.9	76.2	5%	2.9	0.1	0.6	3.6	79.8
		SUBTOTAL 120 - ON SITE	222.4	$6,383.6	$6,316.3	$5,501.5	$18,201.4	$6,383.6	$443.3		$6,483.0	$31,511.3	$2,166.2	$33,677.5		$2,672.0	$133.7	$771.9	$3,577.6	$37,255.1
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1	25%	2,294.6	11,473.0	784.7	12,257.7	10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8	30%	1,598.4	6,926.5	477.0	7,403.5	15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.5	68,508.6	0.0	82,398.1	13,889.5	2,569.1	25%	24,714.2	123,570.9	8,425.2	131,996.1	10%	9,628.8	481.4	2,527.6	12,637.8	144,633.9
	130.50	OFF SITE - UTILITIES	39.1	1,133.4	949.5	224.7	2,307.6	1,133.4	44.0	30%	1,045.5	4,530.5	313.1	4,843.6	15%	516.2	25.8	162.6	704.6	5,548.2
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0	25%	6,961.1	34,805.6	2,386.7	37,192.3	10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.7	$24,233.4	$92,517.9	$230.0	$116,981.3	$24,233.4	$3,478.0		$36,613.8	$181,306.5	$12,386.7	$193,693.2		$14,555.7	$727.7	$3,889.3	$19,172.7	$212,865.9
4.3.1		TOTAL 100 - SITE	1,058.1	$30,617.0	$98,834.2	$5,731.5	$135,182.7	$30,617.0	$3,921.3		$43,096.8	$212,817.8	$14,552.9	227,370.7		$17,227.7	$861.4	$4,661.2	$22,750.3	$250,121.0
	211.02	WHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.03	WHB I - HOT CELL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.04	WHB I - UTILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.05	WHB I - HVAC EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.06	WHB I - HANDL/PACK EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.07	WHB I - SUPPORT FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
		SUBTOTAL 211 - WHB I	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	WHB II - BUILDING/STRUCT	987.4	28,635.0	26,107.5	1,416.6	56,159.1	28,635.0	1,032.2	40%	34,330.5	120,156.8	8,309.8	128,466.6	25%	21,198.5	1,059.9	8,903.4	31,161.8	159,628.4
	212.03	WHB II - HOT CELL EQUIP	114.4	3,318.2	0.0	13,976.2	17,294.4	3,318.2	524.1	40%	8,454.7	29,591.4	2,020.0	31,611.4	25%	5,153.2	257.7	2,164.4	7,575.3	39,186.7
	212.04	WHB II - UTILITIES	159.1	4,388.5	1,631.2	2,434.9	8,454.6	4,388.5	152.5	40%	5,198.2	18,193.8	1,258.6	19,452.4	25%	3,210.8	160.5	1,348.5	4,719.8	24,172.2
	212.05	WHB II - HVAC EQUIPMENT	70.4	2,040.5	2,288.8	1,516.8	5,846.1	2,040.5	142.7	40%	3,211.7	11,241.0	772.9	12,013.9	25%	1,971.7	98.6	828.1	2,898.4	14,912.3
	212.06	WHB II - HANDL/PACK EQUIP	189.5	5,495.2	0.0	28,907.4	34,402.6	5,495.2	1,084.0	40%	16,392.7	57,374.5	3,910.0	61,284.5	25%	9,974.5	498.7	4,189.3	14,662.5	75,947.0
	212.07	WHB II - SUPPORT FAC.	14.7	427.2	0.0	3,880.8	4,308.0	427.2	145.5	40%	1,952.3	6,833.0	464.1	7,297.1	25%	1,183.8	59.2	497.2	1,740.2	9,037.3
		SUBTOTAL 212 - WHB II	1,535.5	$44,304.6	$30,027.5	$52,132.7	$126,464.8	$44,304.6	$3,081.0		$69,540.1	$243,390.5	$16,735.4	$260,125.9		$42,692.5	$2,134.6	$17,930.9	$62,758.0	$322,883.9
	215.01	WASTE TREATMENT BUILDING	122.1	3,540.7	2,876.9	4,681.5	11,099.1	3,540.7	283.4	40%	5,969.3	20,892.5	1,434.7	22,327.2	25%	3,660.0	183.0	1,537.2	5,380.2	27,707.4
	215.02	VEHICLE WASH FACILITY	5.6	163.6	224.2	152.0	539.8	163.6	14.1	30%	215.3	932.8	64.0	996.8	15%	105.5	5.3	33.2	144.0	1,140.8
	215.03	DECONTAMINATION BUILDING	20.1	582.8	933.8	519.7	2,036.3	582.8	54.5	30%	802.1	3,475.7	238.3	3,714.0	15%	392.9	19.6	123.8	536.3	4,250.3
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.6	10,756.9	4,045.2	251.7	40%	6,021.5	21,075.3	1,450.6	22,525.9	25%	3,700.5	185.0	1,554.2	5,439.7	27,965.6
		SUBTOTAL 215 - OTHER	287.5	$8,332.3	$7,600.0	$8,499.8	$24,432.1	$8,332.3	$603.7		$13,008.2	$46,376.3	$3,187.6	$49,563.9		$7,858.9	$392.9	$3,248.4	$11,500.2	$61,064.1
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	1,823.0	$52,636.9	$37,627.5	$60,632.5	$150,896.9	$52,636.9	$3,684.7		$82,548.3	$289,766.8	$19,923.0	$309,689.8		$50,551.4	$2,527.5	$21,179.3	$74,258.2	$383,948.0

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 2
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.1	888.9	1,875.2	509.2	51.2 25%	608.9	3,044.5	208.6	3,253.1 10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2 25%	303.3	1,516.4	104.6	1,621.0 10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.8	568.0	803.2	1,986.0	614.8	51.4 30%	795.7	3,447.9	236.7	3,684.6 15%	390.1	19.5	122.9	532.5	4,217.1
	220.40	MAINTENANCE FACILITIES	50.2	1,454.6	1,858.6	426.1	3,739.3	1,454.6	85.7 25%	1,319.9	6,599.5	454.5	7,054.0 10%	519.4	26.0	136.4	681.8	7,735.8
	220.50	ADMIN/PERSONNEL FACILITIES	92.9	2,692.8	2,500.7	563.6	5,757.1	2,692.8	114.9 30%	2,569.4	11,134.2	768.9	11,903.1 15%	1,267.5	63.4	399.3	1,730.2	13,633.3
	220.60	MOCK-UP BUILDING	20.6	595.9	957.0	501.3	2,054.2	595.9	54.7 30%	811.4	3,516.2	241.2	3,757.4 15%	397.5	19.9	125.2	542.6	4,300.0
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.2	4,477.5	375.5	7,327.2	2,474.2	182.0 25%	2,495.9	12,479.3	857.6	13,336.9 10%	980.1	49.0	257.3	1,286.4	14,623.3
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1 25%	150.7	753.4	51.9	805.3 10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.6	222.1	3,348.0	4,009.7	439.6	133.9 30%	1,375.0	5,958.2	404.9	6,363.1 15%	667.4	33.4	210.2	911.0	7,274.1
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5 30%	451.6	1,957.0	135.1	2,092.1 15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.4	61.0	37.2	0.9 25%	24.8	123.9	8.6	132.5 10%	9.8	0.5	2.6	12.9	145.4
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6 25%	195.5	977.4	66.3	1,043.7 10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.7	2,925.2	4,046.8	1,078.9	111.3 25%	1,309.3	6,546.3	448.5	6,994.8 10%	512.6	25.6	134.6	672.8	7,667.6
	221.90	SEWAGE FACILITY	15.1	439.0	419.4	8.4	866.8	439.0	16.0 25%	330.5	1,652.3	114.3	1,766.6 10%	130.6	6.5	34.3	171.4	1,938.0
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1 30%	4,683.5	20,295.2	1,374.8	21,670.0 15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.7	0.0	5,186.5	5,210.2	23.7	194.5 25%	1,357.1	6,785.5	458.0	7,243.5 10%	523.4	26.2	137.4	687.0	7,930.5
	222.42	BATCH PLANT	10.2	296.2	0.5	1,273.0	1,569.7	296.2	47.8 25%	478.4	2,392.1	163.3	2,555.4 10%	186.6	9.3	49.0	244.9	2,800.3
4.3.2.2		TOTAL 220 - BALANCE OF PLANT	432.4	$12,537.3	$12,825.7	$30,397.3	$55,760.3	$12,537.3	$1,620.8	$19,260.9	$89,179.3	$6,097.8	$95,277.1	$8,566.8	$428.4	$2,522.6	$11,517.8	$106,794.9
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.8	159.1	35.6	348.5	153.8	7.3 30%	152.9	662.5	45.7	708.2 15%	75.3	3.8	23.7	102.8	811.0
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1,221.7	1,857.2	503.3	3,582.2	1,221.7	88.5 35%	1,712.3	6,604.7	454.0	7,058.7 20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.5	6,572.4	6,041.1	17,455.0	4,841.5	473.0 35%	7,969.3	30,738.8	2,107.0	32,845.8 20%	4,459.3	223.0	1,638.8	6,321.1	39,166.9
		TOTAL 230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8	$9,834.5	$38,006.0	$2,606.7	$40,612.7	$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0		GRAND TOTAL SURFACE FACILITIES	3,527.9	$102,008.2	$157,876.1	$103,341.3	$363,225.6	$102,008.2	$9,795.6	$154,740.5	$629,769.9	$43,180.4	$672,950.3	$81,841.3	$4,092.1	$30,378.7	$116,312.1	$789,262.4

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 2
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	5	7	10	13	15	16	16	16	
BUSES AT $100.0 K per YEAR	COST	$200	$500	$700	$1,000	$1,300	$1,500	$1,600	$32,000	$1,600	$40,400
	SUBTOTAL - 100	$226	$526	$726	$1,260	$1,560	$1,760	$1,860	$37,200	$1,860	$46,978
CONTINGENCY @ 20%		$45	$105	$145	$252	$312	$352	$372	$7,440	$372	$9,396
	TOTAL - 100	$271	$631	$871	$1,512	$1,872	$2,112	$2,232	$44,640	$2,232	$56,374
210 - WASTE HANDLING FACILITIES											
LABOR :	# of PEOPLE	16	42	70	98	128	156	164	164	164	
COST PER YR/ PERSON $52,700	COST	$843	$2,213	$3,689	$5,165	$6,746	$8,221	$8,643	$172,856	$8,643	$217,019
OPERATING SUPPLIES @ 5.0% of LABOR		$42	$111	$184	$258	$337	$411	$432	$8,643	$432	$10,851
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$1,920	$1,920	$1,920	$11,520	$11,520	$11,520	$11,520	$230,400	$11,520	$293,760
Capital Cost = 384 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$1,962	$2,031	$2,104	$11,778	$11,857	$11,931	$11,952	$239,043	$11,952	$304,611
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	1.7	1.7	1.7	17	17	17	17	17	17	
@ $.05/Kwhr	COST	$85	$85	$85	$850	$850	$850	$850	$17,000	$850	$21,505
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$74	$76	$79	$442	$445	$447	$448	$8,964	$448	$11,423
	SUBTOTAL - 210	$2,964	$4,405	$5,957	$18,235	$19,898	$21,450	$21,893	$437,863	$21,893	$554,557
CONTINGENCY @ 40%		$1,186	$1,762	$2,383	$7,294	$7,959	$8,580	$8,757	$175,145	$8,757	$221,823
	TOTAL - 210	$4,150	$6,167	$8,340	$25,528	$27,857	$30,030	$30,650	$613,008	$30,650	$776,380
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	45	120	194	267	359	433	470	470	470	
COST PER YR/ PERSON $52,700	COST	$2,372	$6,324	$10,224	$14,071	$18,919	$22,819	$24,769	$495,380	$24,769	$619,647
OPERATING SUPPLIES @ 5.0% of LABOR		$119	$316	$511	$704	$946	$1,141	$1,238	$24,769	$1,238	$30,982
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$775	$775	$775	$3,100	$3,100	$3,100	$3,100	$62,000	$3,100	$79,825
Capital Cost = 155 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$894	$1,091	$1,286	$3,804	$4,046	$4,241	$4,338	$86,769	$4,338	$110,807
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.5	2.5	2.5	25.5	25.5	25.5	25.5	25.5	25.5	
@ $.05/Kwhr	COST	$125	$125	$125	$1,275	$1,275	$1,275	$1,275	$25,500	$1,275	$32,250
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$34	$41	$48	$143	$152	$159	$163	$3,254	$163	$4,155
	SUBTOTAL - 220	$3,424	$7,581	$11,683	$19,292	$24,392	$28,494	$30,545	$610,903	$30,545	$766,859
CONTINGENCY @ 30%		$1,027	$2,274	$3,505	$5,788	$7,318	$8,548	$9,164	$183,271	$9,164	$230,058
	TOTAL - 220	$4,451	$9,855	$15,188	$25,080	$31,710	$37,042	$39,709	$794,174	$39,709	$996,917
TOTAL ANNUAL O & M COST		$8,871	$16,654	$24,400	$52,120	$61,438	$69,184	$72,591	$1,451,822	$72,591	$1,829,671

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 2
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	11	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$1,100	$4,600	$100	$5,800	$1,000	$47,200
	SUBTOTAL - 100	$1,178	$6,394	$178	$7,750	$1,260	$55,988
CONTINGENCY @ 20%		$236	$1,279	$36	$1,550	$252	$11,198
	TOTAL - 100	$1,414	$7,673	$214	$9,300	$1,512	$67,186
210 - WASTE HANDLING FACILITIES							
LABOR :	# of PEOPLE	123	12	6		0	
COST PER YR/ PERSON $52,700	COST	$6,482	$14,545	$316	$21,344	$0	$238,362
OPERATING SUPPLIES @ 5.0% of LABOR		$324	$727	$16	$1,067	$0	$11,918
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$38	$883	$38	$960	$0	$294,720
Capital Cost = 384 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$363	$1,610	$54	$2,027	$0	$306,638
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$22,005
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$14	$60	$2	$76	$0	$11,499
	SUBTOTAL - 210	$6,878	$16,676	$392	$23,947	$0	$578,504
CONTINGENCY @ 40%		$2,751	$6,670	$157	$9,579	$0	$231,402
	TOTAL - 210	$9,629	$23,346	$549	$33,525	$0	$809,906
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	280	64	32		19	
COST PER YR/ PERSON $52,700	COST	$14,756	$77,574	$1,686	$94,017	$10,013	$723,676
OPERATING SUPPLIES @ 5.0% of LABOR		$738	$3,879	$84	$4,701	$501	$36,184
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$775	$17,825	$775	$19,375	$1,550	$100,750
Capital Cost = 155 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,513	$21,704	$859	$24,076	$2,051	$136,934
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$48,500
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$57	$814	$32	$903	$77	$5,135
	SUBTOTAL - 220	$16,876	$112,742	$3,128	$132,745	$14,641	$914,245
CONTINGENCY @ 30%		$5,063	$33,823	$938	$39,824	$4,392	$274,274
	TOTAL - 220	$21,938	$146,565	$4,066	$172,569	$19,033	$1,188,519
TOTAL ANNUAL O & M COST		$32,981	$177,584	$4,829	$215,395	$20,545	$2,065,610

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TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 2
(DOLLARS IN THOUSANDS - IIIQTR88)

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST		INDIRECT COST @ %	SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10%	82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE													
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10%	1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10%	245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE													
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.5	75%	100.4	505.9	35%	177.0	10%	68.3	0.0	(0.2)	751.0
	120.70	ON SITE - DRAINAGE CONTROL		0.0	0.0	0.0											
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10%	9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10%	48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10%	1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9		$457.9	$0.0	$0.8	$5,037.0
	130.11	OFF SITE - ROADS (NEW)															
	130.13	OFF SITE - BRIDGES															
	130.21	OFF SITE - RAIL (NEW)															
	130.50	OFF SITE - UTILITIES															
	140.00	MONUMENTS															
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
4.3.1	TOTAL 100 - SITE		60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9		$457.9	$0.0	$0.8	$5,037.0
	211.02	MHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	75%	0.0	0.0	35%	0.0	10%	0.0	0.0	0.0	0.0
	211.03	MHB I - HOT CELL EQUIPMENT		INCLUDED ABOVE													
	211.04	MHB I - UTILITIES		INCLUDED ABOVE													
	211.05	MHB I - HVAC EQUIPMENT		INCLUDED ABOVE													
	211.06	MHB I - HANDL/PACK EQUIP		INCLUDED ABOVE													
	211.07	MHB I - SUPPORT FACILITIES		INCLUDED ABOVE													
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	258.8	6,821.8	42.3	1,776.1	8,640.2	75%	5,116.4	13,756.6	35%	4,814.8	10%	1,857.1	2,042.9	(0.4)	22,471.0
	212.03	MHB II - HOT CELL EQUIP		INCLUDED ABOVE													
	212.04	MHB II - UTILITIES		INCLUDED ABOVE													
	212.05	MHB II - HVAC EQUIPMENT		INCLUDED ABOVE													
	212.06	MHB II - HANDL/PACK EQUIP		INCLUDED ABOVE													
	212.07	MHB II - SUPPORT FAC.		INCLUDED ABOVE													
		SUBTOTAL 212 - MHB II	258.8	$6,821.8	$42.3	$1,776.1	$8,640.2		$5,116.4	$13,756.6		$4,814.8		$1,857.1	$2,042.9	($0.4)	$22,471.0
	215.01	WASTE TREATMENT BUILDING	19.4	511.5	10.7	199.9	722.0	75%	383.6	1,105.6	35%	387.0	10%	149.3	164.2	(0.1)	1,806.0
	215.02	VEHICLE WASH FACILITY	0.9	25.3	0.0	0.0	25.3	75%	19.0	44.3	35%	15.5	10%	6.0	6.6	(0.4)	72.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10%	21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10%	179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	45.3	$1,195.9	$21.4	$524.9	$1,742.1		$896.9	$2,639.0		$923.7		$356.4	$391.9	($0.9)	$4,310.1
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		304.1	$8,017.7	$63.7	$2,301.0	$10,382.3		$6,013.3	$16,395.6		$5,738.5		$2,213.5	$2,434.8	($1.3)	$26,781.1

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 2
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10%	15.6	17.1	0.2	188.6
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10%	12.5	13.7	0.1	150.8
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10%	19.9	21.9	0.3	241.5
	220.40	MAINTENANCE FACILITIES	9.0	237.3	0.0	0.0	237.3	75%	178.0	415.3	35%	145.3	10%	56.1	61.7	(0.3)	678.1
	220.50	ADMIN/PERSONNEL FACILITIES	14.6	384.9	0.0	0.0	384.9	75%	288.7	673.6	35%	235.8	10%	90.9	100.0	0.7	1,101.0
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10%	25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10%	49.8	54.8	0.2	603.1
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10%	6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10%	13.1	14.4	(0.2)	158.1
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10%	17.4	19.2	(0.1)	210.9
	221.10	EXPLOSIVE MAGAZINES	0.2	5.8	0.0	0.0	5.8	75%	4.4	10.2	35%	3.6	10%	1.4	1.5	0.3	17.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10%	2.1	2.3	0.5	26.2
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10%	23.7	26.0	0.3	286.6
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10%	12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10%	28.7	31.5	0.1	346.9
	222.30	STANDARD EQUIPMENT		0.0	0.0	0.0											
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10%	10.2	11.3	0.4	124.4
4.3.2.2	TOTAL 220 - BALANCE OF PLANT		61.6	$1,624.5	$0.0	$0.0	$1,624.5		$1,234.5	$2,859.0		$1,000.7		$385.9	$424.5	$2.9	$4,673.0
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10%	7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10%	48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10%	168.2	185.0	0.2	2,035.1
	TOTAL 230 - SURFACE SHAFT FAC.		35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8		$223.7	$246.0	$0.1	$2,706.0
4.0	GRAND TOTAL SURFACE FACILITIES		462.5	$12,196.4	$335.2	$2,301.0	$14,832.6		$9,469.8	$24,302.4		$8,505.9		$3,281.0	$3,105.3	$2.5	$39,197.1

03-Nov-88

MRS SYSTEM STUDY - CASE 2
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
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WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTEN-TION ($1000s)	CONTIN-GENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	300	$17,000	$5,100	INCLUDED	$5,100
DHLW	DHLW	12,680	$17,000	$215,560	INCLUDED	$215,560
INTACT PWR	2C	2,544	$31,000	$78,864	INCLUDED	$78,864
INTACT PWR - WESTERN UTILITIES	2C	0	$31,000	$0	INCLUDED	$0
CONSOLIDATED PWR		0	$0	$0	INCLUDED	$0
INTACT BWR (AND PWR/BWR MIXED)	2A	29,176	$31,000	$904,456	INCLUDED	$904,456
INTACT BWR - WESTERN UTILITIES	2A	0	$31,000	$0	INCLUDED	$0
CONSOLIDATED BWR		0	$0	$0	INCLUDED	$0
PWR HARDWARE		0	$0	$0	INCLUDED	$0
BWR HARDWARE		0	$0	$0	INCLUDED	$0
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		44,928		$1,210,364	$0	$1,210,364
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		45,240		$1,219,100	$0	$1,219,100
CONTACT HANDLED WASTE						$65,000
						$1,284,100

MRS STUDY CASES 2,4,6, AND 7
MANAGEMENT AND INTEGRATION COST ESTIMATE
task:2605A138
FILE = ENG-2467.WK1 (RANGE=MGTINT)
06-Oct-88 02:53 PM

All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$38,682			
		EMPLACEMENT		$21,834			
		CARETAKER		$3,197			
		CLOSURE					$13,255
				$63,713	$0	$0	$13,255
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$15,928	$0	$0	$3,314
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $331,481 =====>		$23,204			
		of which	85%	$19,723 is labor			
		and	15%	$3,481 is materials and equipment.			
		Labor converts to at $100k per FTE.		197.23 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			29,031,300	5,251,300	
		CONSULTANT COST			$1,597	$289	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)	DURATION			24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)	PERSONS			605	109	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.	40 PER BUS			$36,289	$7,111	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$549.88	$0.00	$25.72	$575.60
State Sales Tax	0.00	$0.00	$37.87	$32.15	$70.02
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.53	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.54	$461.19
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.92	$337.99
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.12
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$45.33	$2,774.89
State Sales Tax	0.00	$0.00	$71.22	$55.79	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.14
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$9.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$32.38	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.99	$243.68
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.64	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.26	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.26	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$621.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.69	$0.00	$13.85	$198.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.88
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	218.96	$6,063.05	$5,763.68	$4,427.93	$16,254.66
Ind. Labor & Material	72.26	$2,000.81	$0.00	$132.84	$2,133.65
State Sales Tax	0.00	$0.00	$216.14	$171.03	$387.17
QA/QC Impact	14.56	$403.19	$288.18	$228.04	$919.41
	305.78	$8,467.05	$6,268.00	$4,959.84	$19,694.89
Labor Contingency	76.44		Contractor Cost (0.15)		$2,954.24
			Contingency (0.25)		$5,662.29
Task 41024 Total	382.22				$28,311.42
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	95.23	$2,650.64	$7,336.32	$2,582.15	$12,569.11
Ind. Labor & Material	31.59	$874.71	$0.00	$77.46	$952.17
State Sales Tax	0.00	$0.00	$275.12	$99.74	$374.86
QA/QC Impact	6.37	$176.27	$366.81	$132.98	$676.06
	133.69	$3,701.62	$7,978.25	$2,892.33	$14,572.20
Labor Contingency	46.79		Contractor Cost (0.15)		$2,185.84
			Contingency (0.35)		$5,865.31
Task 41025 Total	180.48				$22,623.35
Subject 41020 Total	851.59				$84,552.54
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$1,689.82	$0.00	$1,689.82
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$63.37	$0.00	$63.37
QA/QC Impact	0.00	$0.00	$84.49	$0.00	$84.49
	0.00	$0.00	$1,837.68	$0.00	$1,837.68
Labor Contingency	0.00		Contractor Cost (0.15)		$275.65
			Contingency (0.35)		$739.67
Task 41045 Total	0.00				$2,853.00
Subject 41040 Total	0.00				$2,853.00
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	62.57	$1,888.97	$3,388.64	$2,130.93	$7,408.54
Ind. Labor & Material	20.65	$623.36	$0.00	$63.93	$687.29
State Sales Tax	0.00	$0.00	$127.07	$82.31	$209.38
QA/QC Impact	4.16	$125.62	$169.44	$109.74	$404.80
	87.38	$2,637.95	$3,685.15	$2,386.91	$8,710.01
Labor Contingency	26.21		Contractor Cost (0.15)		$1,306.50
			Contingency (0.30)		$3,004.96
Task 41060 Total	113.59				$13,021.47
Subject 41060 Total	113.59				$13,021.47
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	66.17	$1,832.12	$3,410.11	$121.09	$5,363.32
Ind. Labor & Material	21.84	$604.60	$0.00	$3.63	$608.23
State Sales Tax	0.00	$0.00	$127.88	$4.68	$132.56
QA/QC Impact	4.40	$121.84	$170.51	$6.24	$298.59
	92.40	$2,558.56	$3,708.50	$135.64	$6,402.70
Labor Contingency	23.10		Contractor Cost (0.15)		$960.40
			Contingency (0.25)		$1,840.79
Task 41070 Total	115.51				$9,203.89
Subject 41070 Total	115.51				$9,203.89
Category 41000 Total	1263.70				$130,458.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.98	$0.00	$3.29	$15.27
State Sales Tax	0.00	$0.00	$227.97	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$2,325.37	$0.00	$2,325.37
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$87.20	$0.00	$87.20
QA/QC Impact	0.00	$0.00	$116.27	$0.00	$116.27
	0.00	$0.00	$2,528.84	$0.00	$2,528.84
Labor Contingency	0.00		Contractor Cost (0.15)		$379.33
			Contingency (0.35)		$1,017.86
Task 42030 Total	0.00				$3,926.03
Subject 42030 Total	0.00				$3,926.03
Category 42000 Total	2.09				$20,761.30
Area 40000 Total	1265.79				$151,219.41
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.75	$1,074.95
State Sales Tax	0.00	$0.00	$37.14	$9.97	$47.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$83.84	$83.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	545.42	$17,480.23	$2,230.17	$1,195.22	$20,905.62
Ind. Labor & Material	178.86	$5,768.48	$0.00	$35.86	$5,804.34
State Sales Tax	0.00	$0.00	$83.63	$46.17	$129.80
QA/QC Impact	36.27	$1,162.44	$111.51	$61.55	$1,335.50
	761.68	$24,411.15	$2,425.31	$1,338.80	$28,175.26
Labor Contingency	228.50		Contractor Cost (0.15)		$4,226.29
			Contingency (0.30)		$9,720.47
Task 51031 Total	990.19				$42,122.02
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.29
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	999.01				$43,121.53
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.78	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.64	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	15.46	$372.66	$24.21	$243.54	$640.41
Ind. Labor & Material	4.44	$122.98	$0.00	$7.31	$130.29
State Sales Tax	0.00	$0.00	$0.90	$9.41	$10.31
QA/QC Impact	0.89	$24.78	$1.21	$12.54	$38.53
	18.79	$520.42	$26.32	$272.80	$819.54
Labor Contingency	5.64		Contractor Cost (0.15)		$122.93
			Contingency (0.30)		$282.74
Task 51050 Total	24.43				$1,225.21
Subject 51050 Total	24.43				$1,225.21
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	80.82	$2,237.93	$1,851.62	$651.50	$4,741.05
Ind. Labor & Material	26.67	$738.52	$0.00	$19.54	$758.06
State Sales Tax	0.00	$0.00	$69.44	$25.16	$94.60
QA/QC Impact	5.37	$148.82	$92.58	$33.55	$274.95
	112.87	$3,125.27	$2,013.64	$729.75	$5,868.66
Labor Contingency	33.86		Contractor Cost (0.15)		$880.30
			Contingency (0.30)		$2,024.69
Task 51060 Total	146.73				$8,773.65
Subject 51060 Total	146.73				$8,773.65
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.91	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.49
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$51.97
			Contingency (0.25)		$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.08	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.22
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.69	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.95
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1588.89				$82,554.16
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$409.64	$0.00	$20.10	$430.04
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Contractor Cost (0.15)					$843.16
Labor Contingency	12.81		Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.94	$31.93	$0.00	$0.59	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Contractor Cost (0.15)					$24.52
Labor Contingency	1.19		Contingency (0.30)		$56.39
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Contractor Cost (0.15)					$118.03
Labor Contingency	1.97		Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Contractor Cost (0.15)					$51.76
Labor Contingency	1.85		Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Contractor Cost (0.15)					$1,226.45
Labor Contingency	32.92		Contingency (0.35)		$3,290.69
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1801.63				$105,264.83

* TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT. 3762.82 x 10^3 man-hrs $331,480.50 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$716.85	$2,579.45
State Sales Tax	0.00	$0.00	$23.01	$116.67	$139.68
QA/QC Impact	17.62	$576.86	$33.35	$150.44	$175.45
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.37
			Contingency (0.30)		$5,934.75
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$36.77	$529.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.21	$214.22
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.21	$214.22
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64			Contractor Cost (0.15)	$230.73
				Contingency (0.25)	$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$127.56	$184.89
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68			Contractor Cost (0.15)	$1,506.33
				Contingency (0.25)	$2,887.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.15	$3,922.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86			Contractor Cost (0.15)	$4,710.56
				Contingency (0.25)	$9,411.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87			Contractor Cost (0.15)	$2,393.30
				Contingency (0.25)	$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	2280.19	$63,139.50	$14,226.87	$46,111.64	$123,478.01
Ind. Labor & Material	752.46	$20,836.04	$0.00	$1,383.35	$22,219.39
State Sales Tax	0.00	$0.00	$533.51	$1,781.06	$2,314.57
QA/QC Impact	151.63	$4,198.78	$711.34	$2,374.75	$7,284.87
	3184.29	$88,174.32	$15,471.72	$51,650.80	$155,296.84
Labor Contingency	796.07			Contractor Cost (0.15)	$23,294.53
				Contingency (0.25)	$44,647.84
Task 41024 Total	3980.36				$223,239.21
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1572.69	$43,546.36	$37,241.04	$42,420.92	$123,208.32
Ind. Labor & Material	518.99	$14,370.30	$0.00	$1,272.63	$15,642.93
State Sales Tax	0.00	$0.00	$1,396.54	$1,638.51	$3,035.05
QA/QC Impact	104.58	$2,895.83	$1,862.06	$2,184.68	$6,942.57
	2196.26	$60,812.49	$40,499.64	$47,516.74	$148,828.87
Labor Contingency	768.69			Contractor Cost (0.15)	$22,324.34
				Contingency (0.35)	$59,903.63
Task 41025 Total	2964.96				$231,056.84
Subject 41020 Total	8152.38				$538,727.17
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33			Contractor Cost (0.15)	$8,851.18
				Contingency (0.35)	$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	14.44	$399.85	$331.89	$425.63	$1,157.37
Ind. Labor & Material	4.77	$131.95	$0.00	$12.77	$144.72
State Sales Tax	0.00	$0.00	$12.45	$16.44	$28.89
QA/QC Impact	0.96	$26.59	$16.59	$21.92	$65.10
	20.17	$558.39	$360.93	$476.76	$1,396.08
Labor Contingency	7.06			Contractor Cost (0.15)	$209.42
				Contingency (0.35)	$561.92
Task 41045 Total	27.22				$2,167.42
Subject 41040 Total	27.22				$2,167.42
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	178.15	$5,297.10	$10,627.35	$3,152.07	$19,076.52
Ind. Labor & Material	58.13	$1,748.04	$0.00	$94.56	$1,842.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$398.53	$121.75	$520.28
QA/QC Impact	11.71	$352.26	$531.37	$162.33	$1,045.96
	245.99	$7,397.40	$11,557.25	$3,530.71	$22,485.36
Labor Contingency	73.80		Contractor Cost (0.15)		$3,372.80
			Contingency (0.30)		$7,757.46
Task 41060 Total	319.79				$33,615.62
Subject 41060 Total	319.79				$33,615.62
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	816.87	$22,619.67	$7,699.00	$10,780.23	$41,098.90
Ind. Labor & Material	269.57	$7,464.49	$0.00	$323.41	$7,787.90
State Sales Tax	0.00	$0.00	$288.71	$416.39	$705.10
QA/QC Impact	54.32	$1,504.21	$384.95	$555.18	$2,444.34
	1140.76	$31,588.37	$8,372.66	$12,075.21	$52,036.24
Labor Contingency	285.19		Contractor Cost (0.15)		$7,805.45
			Contingency (0.25)		$14,960.43
Task 41070 Total	1425.95				$74,802.12
Subject 41070 Total	1425.95				$74,802.12
Category 41000 Total	11076.04				$740,921.97
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	351.53	$11,509.10	$41,432.98	$34,833.64	$87,775.72
Ind. Labor & Material	116.00	$3,798.00	$0.00	$1,045.01	$4,843.01
State Sales Tax	0.00	$0.00	$1,553.73	$1,345.45	$2,899.18
QA/QC Impact	23.38	$765.36	$2,071.65	$1,793.93	$4,630.94
	490.91	$16,072.46	$45,058.36	$39,018.03	$100,148.85
Labor Contingency	171.82		Contractor Cost (0.15)		$15,022.33
			Contingency (0.35)		$40,309.61
Task 42010 Total	662.73				$155,481.09
Subject 42010 Total	662.73				$155,481.09
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.92
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	3.32	$108.85	$391.87	$329.45	$830.17
Ind. Labor & Material	1.10	$35.92	$0.00	$9.88	$45.80
State Sales Tax	0.00	$0.00	$14.69	$12.72	$27.41
QA/QC Impact	0.22	$7.24	$19.59	$16.97	$43.80
	4.64	$152.01	$426.15	$369.02	$947.18
Labor Contingency	1.63		Contractor Cost (0.15)		$142.08
			Contingency (0.35)		$381.23
Task 42030 Total	6.27				$1,470.49
Subject 42030 Total	6.27				$1,470.49
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.82	$85.60	$0.00	$0.00	$85.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	951.22				$220,896.50
Area 40000 Total	12027.27				$961,818.47
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	222.37	$6,157.78	$0.00	$41.33	$6,199.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.56
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3738.04	$119,978.13	$5,112.87	$7,577.93	$132,668.93
Ind. Labor & Material	1233.55	$39,592.78	$0.00	$227.34	$39,820.12
State Sales Tax	0.00	$0.00	$191.74	$292.70	$484.44
QA/QC Impact	248.58	$7,978.55	$255.65	$390.26	$8,624.46

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
	5220.18	$167,549.46	$5,560.26	$8,488.23	$181,597.95
				Contractor Cost (0.15)	$27,239.70
Labor Contingency	1566.05			Contingency (0.30)	$62,651.29
Task 51031 Total	6786.23				$271,488.94
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$49.05	$130.24	$179.29
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.26
				Contractor Cost (0.15)	$11,804.70
Labor Contingency	686.05			Contingency (0.30)	$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	9759.13				$389,142.41
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.49	$32.25	$46.74
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
				Contractor Cost (0.15)	$1,647.73
Labor Contingency	86.84			Contingency (0.25)	$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	354.47	$9,815.47	$1,698.19	$3,541.67	$15,055.33
Ind. Labor & Material	116.98	$3,239.11	$0.00	$106.25	$3,345.36
State Sales Tax	0.00	$0.00	$63.69	$136.80	$200.48
QA/QC Impact	23.57	$652.73	$84.91	$182.40	$920.04
	495.02	$13,707.31	$1,846.79	$3,967.12	$19,521.22
				Contractor Cost (0.15)	$2,928.18
Labor Contingency	148.51			Contingency (0.30)	$6,734.83
Task 51050 Total	643.53				$29,184.23
Subject 51050 Total	643.53				$29,184.23
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	462.09	$12,795.20	$8,197.24	$3,468.97	$24,461.41
Ind. Labor & Material	152.49	$4,222.42	$0.00	$104.07	$4,326.49
State Sales Tax	0.00	$0.00	$307.40	$133.99	$441.39
QA/QC Impact	30.73	$850.88	$409.87	$178.65	$1,439.40
	645.30	$17,868.50	$8,914.51	$3,885.68	$30,668.69
				Contractor Cost (0.15)	$4,600.30
Labor Contingency	193.59			Contingency (0.30)	$10,580.70
Task 51060 Total	838.90				$45,849.69
Subject 51060 Total	838.90				$45,849.69
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$94.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
				Contractor Cost (0.15)	$755.49
Labor Contingency	9.79			Contingency (0.25)	$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
				Contractor Cost (0.15)	$92.60
Labor Contingency	0.54			Contingency (0.25)	$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
				Contractor Cost (0.15)	$426.70
Labor Contingency	0.95			Contingency (0.25)	$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47			Contractor Cost (0.15)	$3,063.79
				Contingency (0.30)	$7,046.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,102.66
State Sales Tax	0.00	$0.00	$0.18	$26.82	$27.00
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73			Contractor Cost (0.15)	$2,075.07
				Contingency (0.25)	$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	14114.42				$586,299.80
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64			Contractor Cost (0.15)	$2,153.85
				Contingency (0.25)	$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.64	$2.92	$3.56
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46			Contractor Cost (0.15)	$159.64
				Contingency (0.30)	$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72			Contractor Cost (0.15)	$538.81
				Contingency (0.30)	$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.42	$0.00	$11.14	$141.56
State Sales Tax	0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact	0.95	$26.28	$1.97	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98			Contractor Cost (0.15)	$151.61
				Contingency (0.30)	$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.57	$10,365.32	$0.00	$543.04	$10,908.36
State Sales Tax	0.00	$0.00	$300.65	$699.16	$999.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37			Contractor Cost (0.15)	$10,928.80
				Contingency (0.35)	$29,325.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	16251.94				$728,526.14

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 29031.25 x 10^3 man-hrs $1,731,814.99

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$63.02	$1,214.60
State Sales Tax	0.00	$0.00	$21.68	$86.46	$107.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.27	$39.89
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.27	$39.89
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.27	$39.89
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$36.83	$574.15
State Sales Tax	0.00	$0.00	$12.45	$51.29	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.25
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$248.85
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	472.16	$13,074.11	$4,133.91	$8,890.18	$26,098.20
Ind. Labor & Material	155.81	$4,314.46	$0.00	$266.71	$4,581.17
State Sales Tax	0.00	$0.00	$155.02	$343.38	$498.40
QA/QC Impact	31.40	$869.43	$206.69	$457.84	$1,533.96
	659.37	$18,258.00	$4,495.62	$9,958.11	$32,711.73
Labor Contingency	164.84		Contractor Cost (0.15)		$4,706.76
			Contingency (0.25)		$9,404.62
Task 41070 Total	824.21				$47,023.11
Subject 41070 Total	824.21				$47,023.11
Category 41000 Total	824.21				$47,023.11
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.53
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	847.89				$49,474.96
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.64	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$36.58	$57.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.76	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.84	$22.05
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.45
			Contingency (0.30)		$2,080.24
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency	10.17		Contractor Cost (0.15)		$176.84
			Contingency (0.25)		$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	128.47	$3,557.35	$1,293.04	$855.28	$5,705.67
Ind. Labor & Material	42.40	$1,173.93	$0.00	$25.66	$1,199.59
State Sales Tax	0.00	$0.00	$48.49	$33.04	$81.53
QA/QC Impact	8.54	$236.56	$64.65	$44.05	$345.26
	179.41	$4,967.84	$1,406.18	$958.03	$7,332.05
Labor Contingency	53.82		Contractor Cost (0.15)		$1,026.81
			Contingency (0.30)		$2,529.57
Task 51050 Total	233.23				$10,961.43
Subject 51050 Total	233.23				$10,961.43
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$35.53	$313.12
State Sales Tax	0.00	$0.00	$101.90	$45.75	$147.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency	10.60		Contractor Cost (0.15)		$818.45
			Contingency (0.25)		$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.69	$0.00	$0.14	$9.13
State Sales Tax	0.00	$0.00	$12.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency	0.29		Contractor Cost (0.15)		$66.26
			Contingency (0.25)		$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency	1.03		Contractor Cost (0.15)		$182.30
			Contingency (0.25)		$349.70
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.09	$2,319.59	$0.00	$51.70	$2,371.29
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency	88.99		Contractor Cost (0.15)		$1,956.04
			Contingency (0.30)		$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency	127.54		Contractor Cost (0.15)		$2,248.00
			Contingency (0.25)		$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2736.60				$116,511.01
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.06	$24.44	$138.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency	18.15		Contractor Cost (0.15)		$964.92
			Contingency (0.25)		$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	9.82	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,908.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.35	$0.00	$241.67	$5,259.02
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3849.25				$197,293.64

* TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT. 5251.31 x 10^3 man-hrs $278,157.30 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	112.61	$3,686.69	$283.48	$1,655.36	$5,625.53
Ind. Labor & Material	37.16	$1,216.61	$0.00	$49.66	$1,266.27
State Sales Tax	0.00	$0.00	$10.63	$62.94	$73.57
QA/QC Impact	7.49	$245.17	$14.17	$85.25	$344.59
	157.26	$5,148.47	$308.28	$1,854.21	$7,310.96
Labor Contingency	47.18		Contractor Cost (0.15)		$1,096.65
			Contingency (0.30)		$2,522.28
Task 23011 Total	204.43				$10,929.89
Subject 23010 Total	204.43				$10,929.89
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.57		Contractor Cost (0.15)		$15.38
			Contingency (0.30)		$35.37
Task 23085 Total	2.48				$153.34
Subject 23080 Total	2.48				$153.34
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.48		Contractor Cost (0.15)		$15.38
			Contingency (0.25)		$29.79
Task 23105 Total	2.39				$147.44
Subject 23100 Total	2.39				$147.44
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.23	$40.34	$6.48	$26.01	$72.83
Ind. Labor & Material	0.41	$13.31	$0.00	$0.78	$14.09
State Sales Tax	0.00	$0.00	$0.24	$1.00	$1.24
QA/QC Impact	0.08	$2.68	$0.32	$1.34	$4.34
	1.72	$56.33	$7.04	$29.13	$92.50
Labor Contingency	0.43		Contractor Cost (0.15)		$13.87
			Contingency (0.25)		$26.60
Task 23115 Total	2.15				$132.97
Subject 23110 Total	2.15				$132.97
Category 23000 Total	211.45				$11,363.64
Area 20000 Total	211.45				$11,363.64
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	17.20	$476.40	$97.67	$390.67	$964.74
Ind. Labor & Material	5.68	$157.21	$0.00	$11.72	$168.93
State Sales Tax	0.00	$0.00	$3.66	$15.09	$18.75
QA/QC Impact	1.14	$31.68	$4.88	$20.12	$56.68
	24.03	$665.29	$106.21	$437.60	$1,209.10
Labor Contingency	7.21		Contractor Cost (0.15)		$181.36
			Contingency (0.30)		$417.14
Task 30010 Total	31.23				$1,807.60
Subject 30010 Total	31.23				$1,807.60
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	9.31	$257.87	$52.88	$211.53	$522.28
Ind. Labor & Material	3.07	$85.10	$0.00	$6.35	$91.45
State Sales Tax	0.00	$0.00	$1.98	$8.17	$10.15
QA/QC Impact	0.62	$17.15	$2.64	$10.89	$30.68
	13.01	$360.12	$57.50	$236.94	$654.56
Labor Contingency	3.90		Contractor Cost (0.15)		$98.18
			Contingency (0.30)		$225.82
Task 30080 Total	16.91				$978.56
Subject 30080 Total	16.91				$978.56
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.65	$128.79	$26.40	$105.60	$260.79
Ind. Labor & Material	1.53	$42.50	$0.00	$3.17	$45.67
State Sales Tax	0.00	$0.00	$0.99	$4.08	$5.07
QA/QC Impact	0.31	$8.56	$1.32	$5.44	$15.32
	6.50	$179.85	$28.71	$118.29	$326.85
Labor Contingency	1.62		Contractor Cost (0.15)		$26.03
			Contingency (0.25)		$93.97
Task 30106 Total	8.12				$469.85
Subject 30100 Total	8.12				$469.85

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.50	$116.17	$23.81	$95.25	$235.23
Ind. Labor & Material	1.38	$38.34	$0.00	$2.86	$41.20
State Sales Tax	0.00	$0.00	$0.89	$3.68	$4.57
QA/QC Impact	0.28	$7.73	$1.19	$4.91	$13.83
	5.86	$162.24	$25.89	$106.70	$294.83
Labor Contingency	1.46		Contractor Cost (0.15)		$44.22
			Contingency (0.25)		$84.78
Task 30116 Total	7.32				$423.83
Subject 30110 Total	7.32				$423.83
Category 30000 Total	63.58				$3,679.84
Area 30000 Total	63.58				$3,679.84
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	183.87	$5,091.16	$2,591.04	$723.22	$8,405.42
Ind. Labor & Material	60.68	$1,680.08	$0.00	$21.70	$1,701.78
State Sales Tax	0.00	$0.00	$97.16	$27.93	$125.09
QA/QC Impact	12.23	$338.56	$129.55	$37.25	$505.36
	256.77	$7,109.80	$2,817.75	$810.10	$10,737.65
Labor Contingency	64.19		Contractor Cost (0.15)		$1,610.64
			Contingency (0.25)		$3,087.07
Task 41070 Total	320.97				$15,435.36
Subject 41070 Total	320.97				$15,435.36
Category 41000 Total	320.97				$15,435.36
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$8.83	$224.88
State Sales Tax	0.00	$0.00	$24.75	$8.79	$33.54
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33			Contractor Cost (0.15)	$11.20
				Contingency (0.40)	$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	721.70	$20,177.56	$17,882.98	$10,832.96	$48,893.50
Ind. Labor & Material	238.16	$6,658.58	$0.00	$324.99	$6,983.58
State Sales Tax	0.00	$0.00	$670.41	$418.62	$1,089.03
QA/QC Impact	47.99	$1,341.81	$894.15	$557.90	$2,793.86
	1007.85	$28,177.96	$19,447.74	$12,134.27	$59,759.97
Labor Contingency	403.14			Contractor Cost (0.15)	$8,964.00
				Contingency (0.40)	$27,489.59
Task 43300 Total	1411.00				$96,213.56
Subject 43300 Total	1411.00				$96,213.56
Category 43000 Total	1613.07				$107,190.38
Area 40000 Total	1934.04				$122,625.74
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	204.39	$5,660.07	$821.36	$420.06	$6,901.49
Ind. Labor & Material	67.45	$1,867.82	$0.00	$12.90	$1,880.72
State Sales Tax	0.00	$0.00	$30.80	$16.22	$47.02
QA/QC Impact	13.59	$376.39	$41.07	$21.63	$439.09
	285.44	$7,904.28	$893.23	$470.51	$9,268.02
Labor Contingency	71.36			Contractor Cost (0.15)	$1,390.19
				Contingency (0.25)	$2,664.56
Task 51011 Total	356.79				$13,322.77
Subject 51010 Total	356.79				$13,322.77
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	330.34	$10,589.31	$899.65	$730.77	$12,219.73
Ind. Labor & Material	109.01	$3,494.47	$0.00	$21.85	$3,516.32
State Sales Tax	0.00	$0.00	$33.74	$28.23	$61.97
QA/QC Impact	21.97	$704.19	$44.99	$37.63	$786.81
	461.31	$14,787.97	$978.38	$818.55	$16,584.90
Labor Contingency	138.39			Contractor Cost (0.15)	$2,487.74
				Contingency (0.30)	$5,721.80
Task 51031 Total	599.71				$24,794.44
Subject 51030 Total	599.71				$24,794.44
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	103.53	$2,866.66	$172.42	$381.74	$3,420.82
Ind. Labor & Material	34.16	$946.00	$0.00	$11.45	$957.45
State Sales Tax	0.00	$0.00	$6.46	$14.74	$21.20
QA/QC Impact	6.88	$190.63	$8.62	$19.66	$218.91
	144.58	$4,003.29	$187.50	$427.59	$4,618.38
Labor Contingency	36.14			Contractor Cost (0.15)	$692.76
				Contingency (0.25)	$1,327.78
Task 51040 Total	180.72				$6,638.92
Subject 51040 Total	180.72				$6,638.92
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	168.68	$4,670.82	$4,698.29	$3,970.12	$13,339.23
Ind. Labor & Material	55.67	$1,541.37	$0.00	$119.10	$1,660.47
State Sales Tax	0.00	$0.00	$176.19	$153.35	$329.54
QA/QC Impact	11.22	$310.61	$234.92	$204.46	$749.99
	235.57	$6,522.80	$5,109.40	$4,447.03	$16,079.23
Labor Contingency	70.67			Contractor Cost (0.15)	$2,411.88
				Contingency (0.30)	$5,547.33
Task 51050 Total	306.24				$24,038.44
Subject 51050 Total	306.24				$24,038.44
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	11.91	$330.01	$1,065.97	$464.63	$1,860.61
Ind. Labor & Material	3.93	$108.90	$0.00	$13.94	$122.84
State Sales Tax	0.00	$0.00	$39.97	$17.65	$57.92
QA/QC Impact	0.79	$21.95	$53.30	$23.93	$99.18
	16.64	$460.86	$1,159.24	$520.45	$2,140.55
Labor Contingency	4.16			Contractor Cost (0.15)	$321.09
				Contingency (0.25)	$615.42
Task 51070 Total	20.80				$3,077.06
Subject 51070 Total	20.80				$3,077.06
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.65	$21.37	$210.00	$3.71	$235.08
Ind. Labor & Material	0.22	$7.05	$0.00	$0.11	$7.16
State Sales Tax	0.00	$0.00	$7.87	$0.14	$8.01
QA/QC Impact	0.04	$1.42	$10.50	$0.19	$12.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.91	$29.84	$228.37	$4.15	$262.36
Labor Contingency	0.23		Contractor Cost (0.15)		$39.35
			Contingency (0.25)		$75.75
Task 51080 Total	1.14				$377.13
Subject 51080 Total	1.14				$377.13
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.58	$19.79	$930.09	$115.54	$1,065.42
Ind. Labor & Material	0.19	$6.53	$0.00	$3.47	$10.00
State Sales Tax	0.00	$0.00	$39.88	$4.46	$39.34
QA/QC Impact	0.04	$1.32	$46.51	$5.95	$53.78
	0.81	$27.64	$1,011.48	$129.42	$1,168.54
Labor Contingency	0.20		Contractor Cost (0.15)		$175.28
			Contingency (0.25)		$335.96
Task 51090 Total	1.01				$1,679.78
Subject 51090 Total	1.01				$1,679.78
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	133.46	$4,384.31	$799.33	$815.40	$5,999.04
Ind. Labor & Material	44.04	$1,446.82	$0.00	$24.46	$1,471.28
State Sales Tax	0.00	$0.00	$29.97	$31.28	$61.26
QA/QC Impact	8.88	$291.56	$39.97	$41.99	$373.52
	186.38	$6,122.69	$869.27	$913.34	$7,905.30
Labor Contingency	55.91		Contractor Cost (0.15)		$1,185.80
			Contingency (0.30)		$2,727.33
Task 51100 Total	242.30				$11,818.43
Subject 51100 Total	242.30				$11,818.43
Category 51000 Total	1708.70				$85,746.97
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	42.00	$1,430.94	$5,781.23	$300.18	$7,512.35
Ind. Labor & Material	13.86	$472.21	$0.00	$9.01	$481.22
State Sales Tax	0.00	$0.00	$216.80	$11.59	$228.39
QA/QC Impact	2.79	$95.16	$289.06	$15.46	$399.68
	58.65	$1,998.31	$6,287.09	$336.24	$8,621.64
Labor Contingency	14.66		Contractor Cost (0.15)		$1,293.24
			Contingency (0.25)		$2,478.72
Task 52010 Total	73.32				$12,393.60
Subject 52010 Total	73.32				$12,393.60
52020 Communications					
52020 Communications					
Direct Cost	6.01	$204.69	$2.90	$18.62	$226.21
Ind. Labor & Material	1.98	$67.55	$0.00	$0.56	$68.11
State Sales Tax	0.00	$0.00	$0.11	$0.72	$0.83
QA/QC Impact	0.40	$13.61	$0.14	$0.96	$14.71
	8.39	$285.85	$3.15	$20.86	$309.86
Labor Contingency	2.52		Contractor Cost (0.15)		$46.48
			Contingency (0.30)		$106.91
Task 52020 Total	10.91				$463.25
Subject 52020 Total	10.91				$463.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	139.02	$3,849.25	$17,414.69	$6,996.59	$28,260.53
Ind. Labor & Material	45.88	$1,270.25	$0.00	$209.90	$1,480.15
State Sales Tax	0.00	$0.00	$653.05	$270.27	$923.32
QA/QC Impact	9.24	$255.98	$870.74	$360.32	$1,487.04
	194.14	$5,375.48	$18,938.48	$7,837.05	$32,151.01
Labor Contingency	58.24		Contractor Cost (0.15)		$4,822.65
			Contingency (0.30)		$11,092.09
Task 52040 Total	252.38				$48,065.75
Subject 52040 Total	252.38				$48,065.75
Category 52000 Total	336.60				$60,922.60
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	146.25	$4,744.26	$1,398.25	$3,160.30	$9,302.81
Ind. Labor & Material	48.26	$1,565.61	$0.00	$94.81	$1,660.42
State Sales Tax	0.00	$0.00	$52.44	$122.07	$174.51
QA/QC Impact	9.73	$315.49	$69.92	$162.76	$548.17
	204.24	$6,625.36	$1,520.61	$3,539.94	$11,685.91
Labor Contingency	71.48		Contractor Cost (0.15)		$1,752.89
			Contingency (0.35)		$4,703.58
Task 53000 Total	275.72				$18,142.38
Subject 53000 Total	275.72				$18,142.38
Category 53000 Total	275.72				$18,142.38
Area 50000 Total	2321.03				$164,811.95

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 4530.10 x 10^3 man-hrs $302,481.17 *

Case 3

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Summary Cost Matrix (Table 1)

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Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

Underground Facilities, Project Phase 1 (Capital Costs - Engineering and Construction)

Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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TABLE 1, MRS SYSTEMS STUDY - CASE 3 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$355.95	$27.20	$26.52	$53.72	$14.61	$6.87	$21.47	$431.14
	1000	SUPPORT CONTRACTOR	$55.69	$0.00	$0.00	$0.00	$2.92	$0.90	$3.82	$59.51
	1010	Surface	$40.75			$0.00		$0.90	$0.90	
	1020	Subsurface	$14.94			$0.00	$2.92		$2.92	
	2000	ARCHITECT-ENGINEER	$222.76	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	$11.69	$3.58	$15.27	$238.03
	2010	Surface	$163.01	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$59.75	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	$11.69		$11.69	
	3000	CONSTRUCTION MANAGEMENT	$76.50	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$78.89
	3010	Surface	$54.24	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$22.26			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.20	$0.52	$3.72			$0.00	$3.72
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$93.02	$16.09	$109.11	$1.51	$39.85	$41.36	$328.48
	11000	EMPLOYEE TRANSPORTATION		$85.13	$13.75	$98.88	$1.20		$1.20	$100.08
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$622.59	$2,256.61	$222.14	$2,478.75	$42.44	$39.75	$82.19	$3,183.53
4.3.2.1	21000	WASTE HANDLING FACILITY	$484.53	$1,158.49	$33.76	$1,192.25	XXXXXXXXXX	$32.37	$32.37	$1,709.15
	21100	Waste Handling Building 1:	$98.28	$0.00	$0.00	$0.00	XXXXXXXXXX	$7.44	$7.44	
4.3.2.1.2	21102	Building/Structures	$50.18			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$11.37			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$7.68			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$5.01			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$20.79			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$3.25			$0.00	XXXXXXXXXX		$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 3 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMIS-SIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$339.87	$0.00	$0.00	$0.00	XXXXXXXXXX	$20.61	$20.61	
4.3.2.1.9	21202	Building/Structures	$141.63			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$42.07			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$18.67			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$11.55			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$118.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$7.95			$0.00	XXXXXXXXXX		$0.00	
	21500	Other	$46.38	$0.00	$0.00	$0.00	XXXXXXXXXX	$4.32	$4.32	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.89			$0.00	XXXXXXXXXX	$1.81	$1.81	
	21502	Vehicle Wash Facility	$0.93			$0.00	XXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.48			$0.00	XXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$90.64	$1,071.35	$172.91	$1,244.26	$32.41	$4.67	$37.08	$1,371.98
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.06		$19.06	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.97			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$12.21			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$10.03	$2.71	$12.74	$102.40
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$9.64	$0.67	$10.31	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04 PB	$9.64		$9.64	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 3 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.14	$2.04	$2.18	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.14		$0.14	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.13		$0.13	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.12	$0.00	$0.12	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.12		$0.12	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.24	XXXXXXXXXXXX	$3.24	$99.43
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.59	XXXXXXXXXXXX	$1.59	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.86	XXXXXXXXXXXX	$0.86	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXXX	$0.41	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXXX	$0.41	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXXXX	$0.37	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXXXX	$0.37	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$143.00	$834.95	$43.88	$878.84	$107.69	XXXXXXXXXXXX	$107.69	$1,129.53
4.3.4.1	41000	DEVELOPMENT	$122.82	$641.58	$41.43	$683.01	$13.60	XXXXXXXXXXXX	$13.60	$819.42
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXXX	$0.00	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXXX	$0.00	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXXX	$0.00	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXXX	$0.00	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXXX	$0.00	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXXX	$0.00	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$76.91	$443.01	XXXXXXXXXXXX	$443.01	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXXX	$14.44	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXXX	$47.06	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXXX	$22.94	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41024	Emplacement Drifts	$23.75	$175.51	XXXXXXXXXXXX	$175.51	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$19.55	$183.07	XXXXXXXXXXXX	$183.07	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXXX	$91.61	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXXX	$91.61	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$3.32	$9.39	XXXXXXXXXXXX	$9.39	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$3.32	$9.39	XXXXXXXXXXXX	$9.39	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	41060	Excavated Material Handling	$12.87	$31.64	$0.00	$31.64	$0.00	XXXXXXXXXXXX	$0.00	
	41070	General Maintenance	$8.89	$65.93	$41.43	$107.36	$13.60	XXXXXXXXXXXX	$13.60	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.18	$193.38	$2.45	$195.83	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$216.01
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$123.09	$0.00	$123.09	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.35	$6.34	$0.00	$6.34	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	

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TABLE 1, MRS SYSTEMS STUDY - CASE 3 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$94.09	XXXXXXXXXXX	$94.09	$94.09
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$4.98	XXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$3.04	XXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.69	XXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.59	XXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.56	XXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.12	XXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$83.12	XXXXXXXXXXX	$83.12	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$100.03	$670.01	$195.03	$865.05	$146.03	XXXXXXXXXXX	$146.03	$1,111.11
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$77.32	$527.79	$114.25	$642.04	$75.37	XXXXXXXXXXX	$75.37	$794.73
4.3.5.1.1	51010	Material Support, Receiving/Warehousing	$12.96	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXX	$11.76	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXX	$11.76	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$39.88	$345.65	$33.44	$379.09	$21.88	XXXXXXXXXXX	$21.88	
	51031	Development Area	$38.88	$228.00	$24.42	$252.42	$21.88	XXXXXXXXXXX	$21.88	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$5.93	XXXXXXXXXXX	$5.93	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.01	$23.47	$8.70	$32.17	$20.85	XXXXXXXXXXX	$20.85	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$7.00	$36.54	$0.00	$36.54	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.7	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$2.72	XXXXXXXXXXX	$2.72	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.33	XXXXXXXXXXX	$0.33	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.48	XXXXXXXXXXX	$1.48	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$10.43	XXXXXXXXXXX	$10.43	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$54.66	XXXXXXXXXXX	$54.66	$117.93
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$10.98	XXXXXXXXXXX	$10.98	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.41	XXXXXXXXXXX	$0.41	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$43.27	XXXXXXXXXXX	$43.27	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$16.01	XXXXXXXXXXX	$16.01	$198.45
		TOTAL REPOSITORY	$1,465.16	$3,896.49	$519.58	$4,416.08	$315.52	$86.47	$401.98	$6,283.22
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXX	$1,089.14	$8.74	$1,097.87	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1,097.87
	61000	SPENT FUEL	XXXXXXXXXXXXXX	$728.25	$0.00	$728.25	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$728.25
	61010	Intact PWR	XXXXXXXXXXXXXX	$75.69		$75.69	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXX	$45.21		$45.21	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXX	$434.39		$434.39	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXX	$172.96		$172.96	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXX	$215.56		$215.56	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$215.56
	63000	OTHER WASTE	XXXXXXXXXXXXXX	$145.33	$8.74	$154.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$154.06
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXX	$25.84		$25.84	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXX	$5.10		$5.10	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXX	$108.00		$108.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	99999	TOTAL REPOSITORY, with EMPLACEMENT CONTAINERS	$1,465.16	$4,985.63	$528.32	$5,513.95	$315.52	$86.47	$401.98	$7,381.09

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 3
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.5	2,383.5	0.0	3,021.0	637.5	89.4 25%	937.0	4,684.9	320.1	5,005.0 10%	365.9	18.3	96.1	480.3	5,485.3
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9 25%	588.1	2,940.6	200.6	3,141.2 10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0 25%	79.4	396.8	27.2	424.0 10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.1	0.0	0.0	822.1	822.1	0.0 20%	328.8	1,973.0	138.1	2,111.1 5%	82.2	4.1	17.3	103.6	2,214.7
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0 20%	696.1	4,176.5	292.4	4,468.9 5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3 20%	36.5	218.8	15.2	234.0 5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0 20%	143.5	860.9	60.3	921.2 5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.9	448.4	0.0	697.3	248.9	16.8 20%	192.6	1,155.6	79.5	1,235.1 5%	47.3	2.4	9.9	59.6	1,294.7
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,327.9	9,219.8	2,076.1	267.9 30%	3,469.1	15,032.9	1,027.9	16,060.8 15%	1,694.4	84.7	533.7	2,312.8	18,373.6
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.4	0.0	41.9	16.5	1.0 20%	11.9	71.3	4.9	76.2 5%	2.9	0.1	0.6	3.6	79.8
		SUBTOTAL 120 - ON SITE	222.4	$6,383.6	$6,316.3	$5,501.5	$18,201.4	$6,383.6	$443.3	$6,483.0	$31,511.3	$2,166.2	$33,677.5	$2,672.0	$133.7	$771.9	$3,577.6	$37,255.1
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1 25%	2,294.6	11,473.0	784.7	12,257.7 10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8 30%	1,598.4	6,926.5	477.0	7,403.5 15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.5	68,508.6	0.0	82,398.1	13,889.5	2,569.1 25%	24,714.2	123,570.9	8,425.2	131,996.1 10%	9,628.8	481.4	2,527.6	12,637.8	144,633.9
	130.50	OFF SITE - UTILITIES	39.1	1,133.4	949.5	224.7	2,307.6	1,133.4	44.0 30%	1,045.5	4,530.5	313.1	4,843.6 15%	516.2	25.8	162.6	704.6	5,548.2
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0 25%	6,961.1	34,805.6	2,386.7	37,192.3 10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.7	$24,233.4	$92,517.9	$230.0	$116,981.3	$24,233.4	$3,478.0	$36,613.8	$181,306.5	$12,386.7	$193,693.2	$14,555.7	$727.7	$3,889.3	$19,172.7	$212,865.9
4.3.1		TOTAL 100 - SITE	1,058.1	$30,617.0	$98,834.2	$5,731.5	$135,182.7	$30,617.0	$3,921.3	$43,096.8	$212,817.8	$14,552.9	227,370.7	$17,227.7	$861.4	$4,661.2	$22,750.3	$250,121.0
	211.02	WHB I - BUILDING/STRUCTURE	418.3	12,131.6	10,641.6	517.2	23,290.4	12,131.6	418.5 40%	14,336.2	50,176.7	3,471.4	53,648.1 25%	8,855.5	442.8	3,719.3	13,017.6	66,665.7
	211.03	WHB I - HOT CELL EQUIPMENT	44.8	1,299.8	0.0	5,325.4	6,625.2	1,299.8	199.7 40%	3,249.9	11,374.6	776.7	12,151.3 25%	1,981.3	99.1	832.2	2,912.6	15,063.9
	211.04	WHB I - UTILITIES	65.0	1,881.4	666.7	993.2	3,541.3	1,881.4	62.2 40%	2,194.0	7,678.9	531.4	8,210.3 25%	1,355.7	67.8	569.4	1,992.9	10,203.2
	211.05	WHB I - HVAC EQUIPMENT	29.8	863.5	934.4	850.2	2,648.1	863.5	66.9 40%	1,431.4	5,009.9	344.1	5,354.0 25%	877.9	43.9	368.7	1,290.5	6,644.5
	211.06	WHB I - HANDL/PACK EQUIP	67.5	1,956.1	0.0	10,539.9	12,496.0	1,956.1	395.2 40%	5,938.9	20,786.2	1,416.3	22,202.5 25%	3,613.0	180.7	1,517.5	5,311.2	27,513.7
	211.07	WHB I - SUPPORT FACILITIES	5.6	163.5	0.0	1,924.0	2,087.5	163.5	72.2 40%	929.3	3,252.5	220.6	3,473.1 25%	562.8	28.1	236.4	827.3	4,300.4
		SUBTOTAL 211 - WHB I	631.0	$18,295.9	$12,242.7	$20,149.9	$50,688.5	$18,295.9	$1,214.7	$28,079.7	$98,278.8	$6,760.5	$105,039.3	$17,246.2	$862.4	$7,243.5	$25,352.1	$130,391.4
	212.02	WHB II - BUILDING/STRUCT	1,214.3	35,215.6	28,310.3	1,308.7	64,834.6	35,215.6	1,110.7 40%	40,464.4	141,625.3	9,804.9	151,430.2 25%	25,012.6	1,250.6	10,505.3	36,768.5	188,198.7
	212.03	WHB II - HOT CELL EQUIP	150.0	4,351.5	0.0	20,577.2	24,928.7	4,351.5	771.6 40%	12,020.7	42,072.5	2,869.5	44,942.0 25%	7,320.1	366.0	3,074.4	10,760.5	55,702.5
	212.04	WHB II - UTILITIES	163.3	4,502.7	1,676.9	2,499.2	8,678.8	4,502.7	156.6 40%	5,335.2	18,673.3	1,291.8	19,965.1 25%	3,295.4	164.8	1,384.1	4,844.3	24,809.4
	212.05	WHB II - HVAC EQUIPMENT	72.2	2,094.9	2,345.8	1,569.8	6,010.5	2,094.9	146.8 40%	3,300.9	11,553.1	794.3	12,347.4 25%	2,026.4	101.3	851.1	2,978.8	15,326.2
	212.06	WHB II - HANDL/PACK EQUIP.	321.2	9,315.4	0.0	63,280.1	72,595.5	9,315.4	2,373.0 40%	33,713.6	117,997.5	8,027.3	126,024.8 25%	20,477.7	1,023.9	8,600.6	30,102.2	156,127.0
	212.07	WHB II - SUPPORT FAC.	18.9	549.0	0.0	4,416.2	4,965.2	549.0	165.6 40%	2,271.9	7,951.7	540.4	8,492.1 25%	1,378.6	68.9	579.0	2,026.5	10,518.6
		SUBTOTAL 212 - WHB II	1,939.9	$56,029.1	$32,333.0	$93,651.2	$182,013.3	$56,029.1	$4,724.3	$97,106.7	$339,873.4	$23,328.2	$363,201.6	$59,510.8	$2,975.5	$24,994.5	$87,480.8	$450,682.4
	215.01	WASTE TREATMENT BUILDING	122.1	3,540.7	2,876.9	4,681.5	11,099.1	3,540.7	283.4 40%	5,969.3	20,892.5	1,434.7	22,327.2 25%	3,660.0	183.0	1,537.2	5,380.2	27,707.4
	215.02	VEHICLE WASH FACILITY	5.6	163.6	224.2	152.0	539.8	163.6	14.1 30%	215.3	932.8	64.0	996.8 15%	105.5	5.3	33.2	144.0	1,140.8
	215.03	DECONTAMINATION BUILDING	20.1	582.8	933.8	519.7	2,036.3	582.8	54.5 30%	802.1	3,475.7	238.3	3,714.0 15%	392.9	19.6	123.8	536.3	4,250.3
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.6	10,756.9	4,045.2	251.7 40%	6,021.5	21,075.3	1,450.6	22,525.9 25%	3,700.5	185.0	1,554.2	5,439.7	27,965.6
		SUBTOTAL 215 - OTHER	287.5	$8,332.3	$7,600.0	$8,499.8	$24,432.1	$8,332.3	$603.7	$13,008.2	$46,376.3	$3,187.6	$49,563.9	$7,858.9	$392.9	$3,248.4	$11,500.2	$61,064.1
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	2,858.4	$82,657.3	$52,175.7	$122,300.9	$257,133.9	$82,657.3	$6,542.7	$138,194.6	$484,528.5	$33,276.3	$517,804.8	$84,615.9	$4,230.8	$35,486.4	$124,333.1	$642,137.9

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 3
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.1	888.9	1,875.2	509.2	51.2 25%	608.9	3,044.5	208.6	3,253.1 10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2 25%	303.3	1,516.4	104.6	1,621.0 10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.8	568.0	803.2	1,986.0	614.8	51.4 30%	795.7	3,447.9	236.7	3,684.6 15%	390.1	19.5	122.9	532.5	4,217.1
	220.40	MAINTENANCE FACILITIES	53.0	1,536.4	1,955.9	455.8	3,948.1	1,536.4	90.4 25%	1,393.7	6,968.6	479.9	7,448.5 10%	548.5	27.4	144.0	719.9	8,168.4
	220.50	ADMIN/PERSONNEL FACILITIES	103.3	2,996.6	2,650.5	623.5	6,270.6	2,996.6	122.8 30%	2,817.0	12,207.0	843.3	13,050.3 15%	1,390.1	69.5	437.9	1,897.5	14,947.8
	220.60	MOCK-UP BUILDING	20.6	595.9	957.0	501.3	2,054.2	595.9	54.7 30%	811.4	3,516.2	241.2	3,757.4 15%	397.5	19.9	125.2	542.6	4,300.0
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.2	4,477.5	375.5	7,327.2	2,474.2	182.0 25%	2,495.9	12,479.3	857.6	13,336.9 10%	980.1	49.0	257.3	1,286.4	14,623.3
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1 25%	150.7	753.4	51.9	805.3 10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.6	222.1	3,348.0	4,009.7	439.6	133.9 30%	1,375.0	5,958.2	404.9	6,363.1 15%	667.4	33.4	210.2	911.0	7,274.1
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5 30%	451.6	1,957.0	135.1	2,092.1 15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.4	61.0	37.2	0.9 25%	24.8	123.9	8.6	132.5 10%	9.8	0.5	2.6	12.9	145.4
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6 25%	195.5	977.4	66.3	1,043.7 10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.7	2,925.2	4,046.8	1,078.9	111.3 25%	1,309.3	6,546.3	448.5	6,994.8 10%	512.6	25.6	134.6	672.8	7,667.6
	221.90	SEWAGE FACILITY	15.1	439.0	419.4	8.4	866.8	439.0	16.0 25%	330.5	1,652.3	114.3	1,766.6 10%	130.6	6.5	34.3	171.4	1,938.0
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1 30%	4,683.5	20,295.2	1,374.8	21,670.0 15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.7	0.0	5,186.5	5,210.2	23.7	194.5 25%	1,357.1	6,785.5	458.0	7,243.5 10%	523.4	26.2	137.4	687.0	7,930.5
	222.42	BATCH PLANT	10.2	296.2	0.5	1,273.0	1,569.7	296.2	47.8 25%	478.4	2,392.1	163.3	2,555.4 10%	186.6	9.3	49.0	244.9	2,800.3
4.3.2.2	TOTAL 220 - BALANCE OF PLANT		445.6	$12,922.9	$13,072.8	$30,486.9	$56,482.6	$12,922.9	$1,633.4	$19,582.3	$90,621.2	$6,197.6	$96,818.8	$8,718.5	$435.9	$2,568.8	$11,723.2	$108,542.0
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.8	159.1	35.6	348.5	153.8	7.3 30%	152.9	662.5	45.7	708.2 15%	75.3	3.8	23.7	102.8	811.0
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1,221.7	1,857.2	503.3	3,582.2	1,221.7	88.5 35%	1,712.3	6,604.7	454.0	7,058.7 20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.5	6,572.4	6,041.1	17,455.0	4,841.5	473.0 35%	7,969.3	30,738.8	2,107.0	32,845.8 20%	4,459.3	223.0	1,638.8	6,321.1	39,166.9
	TOTAL 230 - SURFACE SHAFT FAC.		214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8	$9,834.5	$38,006.0	$2,606.7	$40,612.7	$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0	GRAND TOTAL SURFACE FACILITIES		4,576.5	$132,414.2	$172,671.4	$165,099.3	$470,184.9	$132,414.2	$12,666.2	$210,708.2	$825,973.5	$56,633.5	$882,607.0	$116,057.5	$5,802.9	$44,732.0	$166,592.4	$1,049,199.4

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 3
($ 1,000 's - IIIQTR89)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	5	8	11	17	18	18	18		
BUSES AT $100.0 K per YEAR	COST	$200	$500	$800	$1,100	$0	$1,700	$1,800	$36,000	$1,800	$43,900
	SUBTOTAL - 100	$226	$526	$826	$1,360	$260	$1,960	$2,060	$41,200	$2,060	$50,478
CONTINGENCY @ 20%		$45	$105	$165	$272	$52	$392	$412	$8,240	$412	$10,096
	TOTAL - 100	$271	$631	$991	$1,632	$312	$2,352	$2,472	$49,440	$2,472	$60,574
210 - WASTE HANDLING FACILITIES											
LABOR:	# of PEOPLE	20	54	88	124	163	197	208	208	208	
COST PER YR/ PERSON $52,700	COST	$1,054	$2,846	$4,638	$6,535	$8,590	$10,382	$10,962	$219,232	$10,962	$275,199
OPERATING SUPPLIES @ 5.0% of LABOR		$53	$142	$232	$327	$430	$519	$548	$10,962	$548	$13,760
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$3,210	$3,210	$3,210	$19,260	$19,260	$19,260	$19,260	$385,200	$19,260	$491,130
Capital Cost = 642 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$3,263	$3,352	$3,442	$19,587	$19,690	$19,779	$19,808	$396,162	$19,808	$504,890
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.3	2.3	2.3	22.5	22.5	22.5	22.5	22.5	22.5	
@ $.05/Kwhr	COST	$115	$115	$115	$1,125	$1,125	$1,125	$1,125	$22,500	$1,125	$28,470
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$122	$126	$129	$735	$738	$742	$743	$14,856	$743	$18,933
	SUBTOTAL - 210	$4,554	$6,439	$8,324	$27,981	$30,143	$32,028	$32,637	$652,750	$32,637	$827,493
CONTINGENCY @ 40%		$1,822	$2,576	$3,329	$11,192	$12,057	$12,811	$13,055	$261,100	$13,055	$330,997
	TOTAL - 210	$6,376	$9,014	$11,653	$39,173	$42,200	$44,839	$45,692	$913,850	$45,692	$1,158,490
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	49	130	211	290	390	470	510	510	510	
COST PER YR/PERSON $52,700	COST	$2,582	$6,851	$11,120	$15,283	$20,553	$24,769	$26,877	$537,540	$26,877	$672,452
OPERATING SUPPLIES @ 5.0% of LABOR		$129	$343	$556	$764	$1,028	$1,238	$1,344	$26,877	$1,344	$33,623
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$785	$785	$785	$3,140	$3,140	$3,140	$3,140	$62,800	$3,140	$80,855
Capital Cost = 157 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$914	$1,128	$1,341	$3,904	$4,168	$4,378	$4,484	$89,677	$4,484	$114,478
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.6	2.6	2.6	26	26	26	26	26	26	
@ $.05/Kwhr	COST	$130	$130	$130	$1,300	$1,300	$1,300	$1,300	$26,000	$1,300	$32,890
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$34	$42	$50	$146	$156	$164	$168	$3,363	$168	$4,293
	SUBTOTAL - 220	$3,661	$8,151	$12,641	$20,634	$26,177	$30,612	$32,829	$656,580	$32,829	$824,113
CONTINGENCY @ 30%		$1,098	$2,445	$3,792	$6,190	$7,853	$9,183	$9,849	$196,974	$9,849	$247,234
	TOTAL - 220	$4,759	$10,596	$16,433	$26,824	$34,030	$39,795	$42,678	$853,554	$42,678	$1,071,346
TOTAL ANNUAL O & M COST		$11,406	$20,242	$29,077	$67,629	$76,542	$86,986	$90,842	$1,816,843	$90,842	$2,290,410

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 3
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	10	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$1,000	$4,600	$100	$5,700	$1,000	$50,600
	SUBTOTAL - 100	$1,078	$6,394	$178	$7,650	$1,260	$59,388
CONTINGENCY @ 20%		$216	$1,279	$36	$1,530	$252	$11,878
	TOTAL - 100	$1,294	$7,673	$214	$9,180	$1,512	$71,266
210 - WASTE HANDLING FACILITIES							
LABOR:	# of PEOPLE	114	12	6		0	
COST PER YR/ PERSON $52,700	COST	$6,008	$14,545	$316	$20,869	$0	$296,069
OPERATING SUPPLIES @ 5.0% of LABOR		$300	$727	$16	$1,043	$0	$14,803
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$64	$1,477	$64	$1,605	$0	$492,735
Capital Cost = 642 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$365	$2,204	$80	$2,648	$0	$507,538
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$28,970
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$14	$83	$3	$99	$0	$19,033
	SUBTOTAL - 210	$6,406	$17,292	$419	$24,117	$0	$851,610
CONTINGENCY @ 40%		$2,562	$6,917	$168	$9,647	$0	$340,644
	TOTAL - 210	$8,968	$24,208	$587	$33,764	$0	$1,192,254
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	280	64	32		19	
COST PER YR/PERSON $52,700	COST	$14,756	$77,574	$1,686	$94,017	$10,013	$776,482
OPERATING SUPPLIES @ 5.0% of LABOR		$738	$3,879	$84	$4,701	$501	$38,824
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$785	$18,055	$785	$19,625	$1,570	$102,050
Capital Cost = 157 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,523	$21,934	$869	$24,326	$2,071	$140,874
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$49,140
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$57	$823	$33	$912	$78	$5,283
	SUBTOTAL - 220	$16,886	$112,981	$3,138	$133,005	$14,661	$971,779
CONTINGENCY @ 30%		$5,066	$33,894	$941	$39,901	$4,398	$291,534
	TOTAL - 220	$21,952	$146,875	$4,080	$172,906	$19,060	$1,263,312
TOTAL ANNUAL O & M COST		$32,214	$178,756	$4,880	$215,850	$20,572	$2,526,831

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TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 3
(DOLLARS IN THOUSANDS - IIIQTR88)

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST		INDIRECT COST @ %	SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10%	82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE													
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10%	1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10%	245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE													
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.5	75%	100.4	505.9	35%	177.0	10%	68.3	0.0	(0.2)	751.0
	120.70	ON SITE - DRAINAGE CONTROL															
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10%	9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10%	48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10%	1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9		$457.9	$0.0	$0.8	$5,037.0
	130.11	OFF SITE - ROADS (NEW)															
	130.13	OFF SITE - BRIDGES															
	130.21	OFF SITE - RAIL (NEW)															
	130.50	OFF SITE - UTILITIES															
	140.00	MONUMENTS															
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
4.3.1	TOTAL 100 - SITE		60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9		$457.9	$0.0	$0.8	$5,037.0
	211.02	WHB I - BUILDING/STRUCTURE	88.3	2,328.6	9.6	472.9	2,811.1	75%	1,746.4	4,557.5	35%	1,595.1	10%	615.3	676.8	(0.7)	7,444.0
	211.03	WHB I - HOT CELL EQUIPMENT		INCLUDED ABOVE													
	211.04	WHB I - UTILITIES		INCLUDED ABOVE													
	211.05	WHB I - HVAC EQUIPMENT		INCLUDED ABOVE													
	211.06	WHB I - HANDL/PACK EQUIP		INCLUDED ABOVE													
	211.07	WHB I - SUPPORT FACILITIES		INCLUDED ABOVE													
		SUBTOTAL 211 - WHB I	88.3	$2,328.6	$9.6	$472.9	$2,811.1		$1,746.4	$4,557.5		$1,595.1		$615.3	$676.8	($0.7)	$7,444.0
	212.02	WHB II - BUILDING/STRUCT	235.3	6,201.6	38.5	1,726.0	7,966.1	75%	4,651.2	12,617.3	35%	4,416.1	10%	1,703.3	1,873.7	(0.4)	20,610.0
	212.03	WHB II - HOT CELL EQUIP		INCLUDED ABOVE													
	212.04	WHB II - UTILITIES		INCLUDED ABOVE													
	212.05	WHB II - HVAC EQUIPMENT		INCLUDED ABOVE													
	212.06	WHB II - HANDL/PACK EQUIP		INCLUDED ABOVE													
	212.07	WHB II - SUPPORT FAC.		INCLUDED ABOVE													
		SUBTOTAL 212 - WHB II	235.3	$6,201.6	$38.5	$1,726.0	$7,966.1		$4,651.2	$12,617.3		$4,416.1		$1,703.3	$1,873.7	($0.4)	$20,610.0
	215.01	WASTE TREATMENT BUILDING	19.4	511.5	10.7	199.9	722.0	75%	383.6	1,105.6	35%	387.0	10%	149.3	164.2	(0.1)	1,806.0
	215.02	VEHICLE WASH FACILITY	0.9	25.3	0.0	0.0	25.3	75%	19.0	44.3	35%	15.5	10%	6.0	6.6	(0.4)	72.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10%	21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10%	179.9	197.8		2,176.2
		SUBTOTAL 215 - OTHER	45.3	$1,195.9	$21.4	$524.9	$1,742.1		$896.9	$2,639.0		$923.7		$356.4	$391.9	($0.7)	$4,310.3
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		368.8	$9,726.1	$69.5	$2,723.8	$12,519.3		$7,294.5	$19,813.8		$6,934.9		$2,675.0	$2,942.4	($1.8)	$32,364.3

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TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 3
(DOLLARS IN THOUSANDS - IIIQTR88)

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10% 15.6	17.1	0.2	188.6
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10% 12.5	13.7	0.1	150.8
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10% 19.9	21.9	0.3	241.5
	220.40	MAINTENANCE FACILITIES	9.0	237.3	0.0	0.0	237.3	75%	178.0	415.3	35%	145.3	10% 56.1	61.7	(0.3)	678.1
	220.50	ADMIN/PERSONNEL FACILITIES	14.6	384.9	0.0	0.0	384.9	75%	288.7	673.6	35%	235.8	10% 90.9	100.0	0.5	1,100.8
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10% 25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10% 49.8	54.8	0.2	603.1
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10% 6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10% 13.1	14.4	(0.2)	158.1
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10% 17.4	19.2	(0.1)	210.9
	221.10	EXPLOSIVE MAGAZINES	0.2	5.8	0.0	0.0	5.8	75%	4.4	10.2	35%	3.6	10% 1.4	1.5	0.3	17.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10% 2.1	2.3	0.5	26.2
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10% 23.7	26.0	0.3	286.6
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10% 12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10% 28.7	31.5	0.1	346.9
	222.30	STANDARD EQUIPMENT														
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10% 10.2	11.3	0.4	124.4
4.3.2.2	TOTAL 220 - BALANCE OF PLANT		61.6	$1,624.5	$0.0	$0.0	$1,624.5		$1,234.5	$2,859.0		$1,000.7	$385.9	$424.5	$2.7	$4,672.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10% 7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10% 48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10% 168.2	185.0	0.3	2,035.2
	TOTAL 230 - SURFACE SHAFT FAC.		35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8	$223.7	$246.0	$0.2	$2,706.1
4.0 R	GRAND TOTAL SURFACE FACILITIES		527.3	$13,904.8	$341.0	$2,723.8	$16,969.6		$10,751.0	$27,720.6		$9,702.3	$3,742.5	$3,612.9	$1.9	$44,780.2

03-Nov-88

MRS SYSTEM STUDY - CASE 3
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
C:\LOTUS\CONT_C3 REVISION "C"

WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTENTION ($1000s)	CONTINGENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	300	$17,000	$5,100	INCLUDED	$5,100
DHLW	DHLW	12,680	$17,000	$215,560	INCLUDED	$215,560
INTACT PWR	1D	2,610	$29,000	$75,690	INCLUDED	$75,690
INTACT PWR - WESTERN UTILITIES	1D	0	$29,000	$0	INCLUDED	$0
CONSOLIDATED PWR	1A	14,979	$29,000	$434,391	INCLUDED	$434,391
INTACT BWR and/or PWR/BWR MIXED	1C	1,559	$29,000	$45,211	INCLUDED	$45,211
INTACT BWR - WESTERN UTILITIES	1C	0	$29,000	$0	INCLUDED	$0
CONSOLIDATED BWR	1B	5,964	$29,000	$172,956	INCLUDED	$172,956
PWR HARDWARE	1E	0	$26,000	$0	INCLUDED	$0
BWR HARDWARE	1E	994	$26,000	$25,844	INCLUDED	$25,844
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		39,314		$981,136	$0	$981,136
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		39,626		$989,872	$0	$989,872
CONTACT HANDLED WASTE						$108,000
						$1,097,872

UNDERGROUND FACILITIES - CASE 3

MRS STUDY CASES 1 AND 3
MANAGEMENT AND INTEGRATION COST ESTIMATE - UNDERGROUND FACILITIES
task:2605A138
FILE = ENG-1M3M.WK1 (RANGE=MGTINT)
06-Oct-88 02:35 PM

All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$37,104			
		EMPLACEMENT		$19,521			
		CARETAKER		$3,123			
		CLOSURE					$11,686
				$59,749	$0	$0	$11,686
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$14,937	$0	$0	$2,921
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $318,029 =====>		$22,262			
		of which	85%	$18,923 is labor			
		and	15%	$3,339 is materials and equipment.			
		Labor converts to at $100k per FTE.		189.23 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			25,969,900	5,105,100	
		CONSULTANT COST			$1,428	$281	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)	DURATION			24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)	PERSONS			541	106	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.	40 PER BUS			$32,462	$6,913	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$549.88	$0.00	$25.72	$575.60
State Sales Tax	0.00	$0.00	$37.87	$33.12	$70.99
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.53	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.54	$461.19
State Sales Tax	0.00	$0.00	$23.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.62	$337.69
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.15
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$43.33	$2,772.89
State Sales Tax	0.00	$0.00	$77.26	$47.75	$125.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.14
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$8.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.52
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.36	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.59	$243.28
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.64	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49			Contractor Cost (0.15)	$1,065.85
				Contingency (0.25)	$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37			Contractor Cost (0.15)	$1,272.20
				Contingency (0.25)	$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.66	$0.00	$13.88	$198.54
State Sales Tax	0.00	$0.00	$224.18	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92			Contractor Cost (0.15)	$1,169.88
				Contingency (0.25)	$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	172.35	$4,772.57	$5,472.90	$3,485.47	$13,730.94
Ind. Labor & Material	56.88	$1,574.95	$0.00	$104.56	$1,679.51
State Sales Tax	0.00	$0.00	$205.23	$134.63	$339.86
QA/QC Impact	11.46	$317.38	$273.65	$179.50	$770.53
	240.69	$6,664.90	$5,951.78	$3,904.16	$16,520.84
Labor Contingency	60.17			Contractor Cost (0.15)	$2,478.13
				Contingency (0.25)	$4,749.75
Task 41024 Total	300.87				$23,748.72
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	77.79	$2,071.00	$6,840.60	$2,017.48	$10,929.08
Ind. Labor & Material	24.68	$683.43	$0.00	$60.52	$743.95
State Sales Tax	0.00	$0.00	$256.53	$77.92	$334.45
QA/QC Impact	4.97	$137.72	$342.02	$103.90	$583.64
	104.45	$2,892.15	$7,439.15	$2,259.82	$12,591.12
Labor Contingency	36.56			Contractor Cost (0.15)	$1,888.67
				Contingency (0.35)	$5,067.93
Task 41025 Total	141.01				$19,547.72
Subject 41020 Total	730.77				$76,914.21
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00			Contractor Cost (0.15)	$518.88
				Contingency (0.35)	$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	3.16	$87.38	$1,764.56	$85.12	$1,937.06
Ind. Labor & Material	1.04	$28.84	$0.00	$2.55	$31.39
State Sales Tax	0.00	$0.00	$66.17	$3.29	$69.46
QA/QC Impact	0.21	$5.81	$88.23	$4.38	$98.42
	4.41	$122.03	$1,918.96	$95.34	$2,136.33
Labor Contingency	1.54			Contractor Cost (0.15)	$320.45
				Contingency (0.35)	$859.87
Task 41045 Total	5.95				$3,316.65
Subject 41040 Total	5.95				$3,316.65
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	61.90	$1,869.91	$3,327.06	$2,121.39	$7,318.36
Ind. Labor & Material	20.43	$617.07	$0.00	$63.64	$680.71
State Sales Tax	0.00	$0.00	$124.76	$81.94	$206.70
QA/QC Impact	4.12	$124.35	$166.36	$109.25	$399.96
	86.44	$2,611.33	$3,618.18	$2,376.22	$8,605.73
Labor Contingency	25.93			Contractor Cost (0.15)	$1,290.86
				Contingency (0.30)	$2,968.98
Task 41060 Total	112.37				$12,865.57
Subject 41060 Total	112.37				$12,865.57
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	61.60	$1,705.62	$3,381.54	$112.73	$5,199.89
Ind. Labor & Material	20.33	$562.85	$0.00	$7.38	$570.23
State Sales Tax	0.00	$0.00	$126.80	$4.35	$131.15
QA/QC Impact	4.10	$113.42	$169.08	$5.81	$288.31
	86.02	$2,381.89	$3,677.42	$126.27	$6,185.58
Labor Contingency	21.51			Contractor Cost (0.15)	$927.83
				Contingency (0.25)	$1,778.36
Task 41070 Total	107.53				$8,891.77
Subject 41070 Total	107.53				$8,891.77
Category 41000 Total	1139.64				$122,815.41

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.98	$0.00	$3.29	$15.27
State Sales Tax	0.00	$0.00	$227.97	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$1,982.89	$0.00	$1,982.89
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$74.36	$0.00	$74.36
QA/QC Impact	0.00	$0.00	$99.14	$0.00	$99.14
	0.00	$0.00	$2,156.39	$0.00	$2,156.39
Labor Contingency	0.00		Contractor Cost (0.15)		$323.45
			Contingency (0.35)		$867.94
Task 42030 Total	0.00				$3,347.78
Subject 42030 Total	0.00				$3,347.78
Category 42000 Total	2.09				$20,183.05
Area 40000 Total	1141.73				$142,998.46
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.75	$1,074.95
State Sales Tax	0.00	$0.00	$37.14	$9.97	$47.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$63.84	$63.84
State Sales Tax	0.00	$0.00	$0.00	$107.85	$107.85
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	500.98	$16,049.75	$2,167.46	$1,105.35	$19,322.56
Ind. Labor & Material	165.32	$5,296.42	$0.00	$33.16	$5,329.58
State Sales Tax	0.00	$0.00	$81.28	$42.69	$123.97
QA/QC Impact	33.32	$1,067.31	$108.38	$56.93	$1,232.62
	699.62	$22,413.48	$2,357.12	$1,238.13	$26,008.73
Labor Contingency	209.89		Contractor Cost (0.15)		$3,901.31
			Contingency (0.30)		$8,973.01
Task 51031 Total	909.51				$38,883.05
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.29
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	918.34				$39,882.56
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.28	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.64	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	10.90	$301.77	$19.68	$208.18	$529.63
Ind. Labor & Material	3.60	$99.58	$0.00	$6.25	$105.83
State Sales Tax	0.00	$0.00	$0.74	$8.04	$8.78
QA/QC Impact	0.72	$20.07	$0.98	$10.72	$31.77
	15.22	$421.42	$21.40	$233.19	$676.01
Labor Contingency	4.57		Contractor Cost (0.15)		$101.40
			Contingency (0.30)		$233.22
Task 51050 Total	19.78				$1,010.63
Subject 51050 Total	19.78				$1,010.63
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	64.41	$1,783.54	$1,457.52	$539.73	$3,780.79
Ind. Labor & Material	21.26	$588.57	$0.00	$16.19	$604.76
State Sales Tax	0.00	$0.00	$54.65	$20.85	$75.50
QA/QC Impact	4.28	$118.61	$72.88	$27.80	$219.29
	89.95	$2,490.72	$1,585.05	$604.57	$4,680.34
Labor Contingency	26.98		Contractor Cost (0.15)		$702.05
			Contingency (0.30)		$1,614.71
Task 51060 Total	116.93				$6,997.10
Subject 51060 Total	116.93				$6,997.10
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.91	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.42
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$51.97
			Contingency (0.25)		$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.26
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.69	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.05
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1473.78				$77,324.06
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$409.64	$0.00	$20.10	$430.04
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.92	$31.93	$0.00	$0.59	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.36
			Contingency (0.30)		$56.39
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.69
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1686.51				$100,034.73

TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT	3523.64 x 10^3 man-hrs	$318,029.45

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$116.85	$2,979.45
State Sales Tax	0.00	$0.00	$25.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.34
			Contingency (0.30)		$5,937.78
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$36.77	$529.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.61	$214.62
State Sales Tax	0.00	$0.00	$4.66	$18.20	$22.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64			Contractor Cost (0.15)	$230.73
				Contingency (0.25)	$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$127.56	$184.89
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68			Contractor Cost (0.15)	$1,506.33
				Contingency (0.25)	$2,687.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$317.15	$3,925.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86			Contractor Cost (0.15)	$4,910.56
				Contingency (0.25)	$9,411.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87			Contractor Cost (0.15)	$2,393.30
				Contingency (0.25)	$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	1792.65	$49,639.36	$11,184.96	$36,252.30	$97,076.62
Ind. Labor & Material	591.58	$16,380.99	$0.00	$1,087.57	$17,468.56
State Sales Tax	0.00	$0.00	$419.44	$1,400.25	$1,819.69
QA/QC Impact	119.21	$3,301.02	$559.25	$1,866.99	$5,727.26
	2503.44	$69,321.37	$12,163.65	$40,607.11	$122,092.13
Labor Contingency	625.86			Contractor Cost (0.15)	$18,313.81
				Contingency (0.25)	$35,101.49
Task 41024 Total	3129.30				$175,507.43
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1246.06	$34,502.11	$29,506.36	$33,610.42	$97,618.89
Ind. Labor & Material	411.20	$11,385.70	$0.00	$1,008.31	$12,394.01
State Sales Tax	0.00	$0.00	$1,106.49	$1,298.20	$2,404.69
QA/QC Impact	82.86	$2,294.39	$1,475.31	$1,730.94	$5,500.64
	1740.12	$48,182.20	$32,088.16	$37,647.87	$117,918.23
Labor Contingency	609.04			Contractor Cost (0.15)	$17,687.73
				Contingency (0.35)	$41,466.09
Task 41025 Total	2349.16				$183,068.05
Subject 41020 Total	6685.52				$443,006.60
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33			Contractor Cost (0.15)	$8,851.18
				Contingency (0.35)	$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	63.57	$1,760.12	$1,495.22	$1,750.75	$5,006.09
Ind. Labor & Material	20.98	$580.84	$0.00	$52.52	$633.36
State Sales Tax	0.00	$0.00	$56.07	$67.62	$123.69
QA/QC Impact	4.23	$117.05	$74.76	$90.16	$281.97
	88.77	$2,458.01	$1,626.05	$1,961.05	$6,045.11
Labor Contingency	31.07			Contractor Cost (0.15)	$906.76
				Contingency (0.35)	$2,433.15
Task 41045 Total	119.84				$9,385.02
Subject 41040 Total	119.84				$9,385.02
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	170.18	$5,127.43	$9,718.69	$3,067.73	$17,913.85
Ind. Labor & Material	56.16	$1,692.05	$0.00	$92.03	$1,784.08

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$364.45	$118.49	$482.94
QA/QC Impact	11.32	$340.97	$485.94	$157.99	$984.90
	237.65	$7,160.45	$10,569.08	$3,436.24	$21,165.77
Labor Contingency	71.30		Contractor Cost (0.15)		$3,174.87
			Contingency (0.30)		$7,302.19
Task 41060 Total	308.95				$31,642.83
Subject 41060 Total	308.95				$31,642.83
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	720.00	$19,937.28	$6,786.00	$9,501.84	$36,225.12
Ind. Labor & Material	237.60	$6,579.30	$0.00	$285.06	$6,864.36
State Sales Tax	0.00	$0.00	$254.48	$367.01	$621.49
QA/QC Impact	47.88	$1,325.83	$339.30	$489.34	$2,154.47
	1005.48	$27,842.41	$7,379.78	$10,643.25	$45,865.44
Labor Contingency	251.37		Contractor Cost (0.15)		$6,879.81
			Contingency (0.25)		$13,186.31
Task 41070 Total	1256.85				$65,931.56
Subject 41070 Total	1256.85				$65,931.56
Category 41000 Total	9521.87				$641,575.65
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	278.30	$9,111.49	$32,801.54	$27,576.99	$69,490.02
Ind. Labor & Material	91.84	$3,006.79	$0.00	$827.31	$3,834.10
State Sales Tax	0.00	$0.00	$1,230.06	$1,065.16	$2,295.22
QA/QC Impact	18.51	$605.91	$1,640.08	$1,420.22	$3,666.21
	388.64	$12,724.19	$35,671.68	$30,889.68	$79,285.55
Labor Contingency	136.02		Contractor Cost (0.15)		$11,892.83
			Contingency (0.35)		$31,812.43
Task 42010 Total	524.67				$123,090.81
Subject 42010 Total	524.67				$123,090.81
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	14.34	$469.51	$1,690.24	$1,421.02	$3,580.77
Ind. Labor & Material	4.73	$154.84	$0.00	$42.63	$197.47
State Sales Tax	0.00	$0.00	$63.38	$54.89	$118.27
QA/QC Impact	0.95	$31.22	$84.51	$73.18	$188.91
	20.03	$655.67	$1,838.13	$1,591.72	$4,085.52
Labor Contingency	7.01		Contractor Cost (0.15)		$612.84
			Contingency (0.35)		$1,644.42
Task 42030 Total	27.04				$6,342.78
Subject 42030 Total	27.04				$6,342.78
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.82	$92.60	$0.00	$0.00	$92.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	833.93				$193,378.51
Area 40000 Total	10355.79				$834,954.16
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	222.37	$6,157.78	$0.00	$41.33	$6,199.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.56
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3138.52	$100,722.58	$4,300.61	$6,403.89	$111,427.08
Ind. Labor & Material	1035.71	$33,238.45	$0.00	$192.12	$33,430.57
State Sales Tax	0.00	$0.00	$161.28	$247.35	$408.63
QA/QC Impact	208.71	$6,698.05	$215.03	$329.80	$7,242.88

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
	4382.95	$140,659.08	$4,676.92	$7,173.16	$152,509.16
Labor Contingency	1314.89			Contractor Cost (0.15)	$22,876.37
				Contingency (0.30)	$52,615.66
Task 51031 Total	5697.84				$228,001.19
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$49.05	$130.94	$179.99
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.96
Labor Contingency	686.05			Contractor Cost (0.15)	$11,804.70
				Contingency (0.30)	$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	8670.74				$345,654.66
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.47	$32.70	$47.17
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
Labor Contingency	86.84			Contractor Cost (0.15)	$1,647.73
				Contingency (0.25)	$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	283.06	$7,838.05	$1,378.01	$2,905.45	$12,121.51
Ind. Labor & Material	93.41	$2,586.36	$0.00	$87.16	$2,673.52
State Sales Tax	0.00	$0.00	$51.68	$116.22	$167.90
QA/QC Impact	18.82	$521.23	$68.90	$149.63	$739.76
	395.30	$10,945.84	$1,498.59	$3,254.46	$15,698.89
Labor Contingency	118.59			Contractor Cost (0.15)	$2,354.84
				Contingency (0.30)	$5,716.12
Task 51050 Total	513.88				$23,769.85
Subject 51050 Total	513.88				$23,469.85
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	367.44	$10,174.44	$6,507.66	$2,816.81	$19,498.91
Ind. Labor & Material	121.26	$3,357.57	$0.00	$84.50	$3,442.07
State Sales Tax	0.00	$0.00	$244.04	$108.80	$352.84
QA/QC Impact	24.43	$676.60	$325.38	$145.07	$1,147.05
	513.13	$14,208.61	$7,077.08	$3,155.18	$24,440.87
Labor Contingency	153.94			Contractor Cost (0.15)	$3,666.14
				Contingency (0.30)	$8,432.10
Task 51060 Total	667.07				$36,539.11
Subject 51060 Total	667.07				$36,539.11
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$94.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
Labor Contingency	9.79			Contractor Cost (0.15)	$755.49
				Contingency (0.25)	$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
Labor Contingency	0.54			Contractor Cost (0.15)	$92.60
				Contingency (0.25)	$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
Labor Contingency	0.95			Contractor Cost (0.15)	$426.70
				Contingency (0.25)	$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47		Contractor Cost (0.15)		$3,063.79
			Contingency (0.30)		$7,046.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax	0.00	$0.00	$0.18	$26.84	$27.02
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73		Contractor Cost (0.15)		$2,075.07
			Contingency (0.25)		$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	12724.55				$527,787.09
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64		Contractor Cost (0.15)		$2,153.85
			Contingency (0.25)		$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.64	$2.92	$3.56
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46		Contractor Cost (0.15)		$159.64
			Contingency (0.30)		$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72		Contractor Cost (0.15)		$538.81
			Contingency (0.30)		$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.42	$0.00	$11.14	$141.56
State Sales Tax	0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact	0.95	$26.28	$1.97	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98		Contractor Cost (0.15)		$151.61
			Contingency (0.30)		$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.57	$10,365.32	$0.00	$543.04	$10,908.36
State Sales Tax	0.00	$0.00	$300.65	$698.16	$998.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37		Contractor Cost (0.15)		$10,928.80
			Contingency (0.35)		$29,325.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	14862.08				$670,013.43

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 25969.92 x 10^3 man-hrs $1,546,437.97

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$64.05	$1,614.60
State Sales Tax	0.00	$0.00	$21.68	$82.46	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$39.83	$574.15
State Sales Tax	0.00	$0.00	$16.25	$51.29	$67.54
QA/QC Impact	3.89	$107.67	$16.80	$68.38	$192.85
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.25
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.78	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.05
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	416.00	$11,519.04	$3,642.21	$7,832.76	$22,994.01
Ind. Labor & Material	137.28	$3,801.28	$0.00	$234.98	$4,036.26
State Sales Tax	0.00	$0.00	$136.58	$302.54	$439.12
QA/QC Impact	27.66	$766.02	$182.11	$403.39	$1,351.52
	580.94	$16,086.34	$3,960.90	$8,773.67	$28,820.91
Labor Contingency	145.24		Contractor Cost (0.15)		$4,323.14
			Contingency (0.25)		$8,286.02
Task 41070 Total	726.18				$41,430.07
Subject 41070 Total	726.18				$41,430.07
Category 41000 Total	726.18				$41,430.07
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.53
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	749.85				$43,881.92
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.64	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$35.58	$56.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.72	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.84	$22.05
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.45
			Contingency (0.30)		$2,080.24
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Contractor Cost (0.15)					$176.84
Labor Contingency	10.17			Contingency (0.25)	$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	101.98	$2,823.30	$1,026.22	$678.79	$4,528.31
Ind. Labor & Material	33.65	$931.69	$0.00	$20.36	$952.05
State Sales Tax	0.00	$0.00	$38.48	$26.22	$64.70
QA/QC Impact	6.78	$187.75	$51.32	$34.96	$274.03
	142.39	$3,942.74	$1,116.02	$760.33	$5,819.09
Contractor Cost (0.15)					$872.87
Labor Contingency	42.72			Contingency (0.30)	$2,007.59
Task 51050 Total	185.10				$8,699.55
Subject 51050 Total	185.10				$8,699.55
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$35.53	$313.12
State Sales Tax	0.00	$0.00	$101.90	$45.25	$147.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Contractor Cost (0.15)					$818.43
Labor Contingency	10.60			Contingency (0.25)	$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.69	$0.00	$0.14	$9.13
State Sales Tax	0.00	$0.00	$12.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Contractor Cost (0.15)					$62.26
Labor Contingency	0.29			Contingency (0.25)	$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Contractor Cost (0.15)					$182.30
Labor Contingency	1.03			Contingency (0.25)	$349.70
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.09	$2,319.56	$0.00	$51.70	$2,371.26
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Contractor Cost (0.15)					$1,956.04
Labor Contingency	88.99			Contingency (0.30)	$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Contractor Cost (0.15)					$2,248.00
Labor Contingency	127.54			Contingency (0.25)	$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2688.47				$114,249.13
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.06	$22.44	$136.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Contractor Cost (0.15)					$964.92
Labor Contingency	18.15			Contingency (0.25)	$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	9.82	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,908.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.36	$0.00	$241.67	$5,259.02
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3801.12				$195,031.76

* TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT. 5105.15 x 10^3 man-hrs $270,302.38

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	99.36	$3,252.96	$250.13	$1,460.61	$4,963.70
Ind. Labor & Material	32.79	$1,073.48	$0.00	$43.82	$1,117.30
State Sales Tax	0.00	$0.00	$9.38	$56.42	$65.80
QA/QC Impact	6.61	$216.32	$12.51	$75.22	$304.05
	138.76	$4,542.76	$272.02	$1,636.07	$6,450.85
Labor Contingency	41.63		Contractor Cost (0.15)		$967.64
			Contingency (0.30)		$2,225.55
Task 23011 Total	180.38				$9,644.04
Subject 23010 Total	180.38				$9,644.04
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.51		Contractor Cost (0.15)		$13.58
			Contingency (0.30)		$31.23
Task 23085 Total	2.19				$135.31
Subject 23080 Total	2.19				$135.31
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.42		Contractor Cost (0.15)		$13.58
			Contingency (0.25)		$26.02
Task 23105 Total	2.11				$130.10
Subject 23100 Total	2.11				$130.10
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.07	$35.08	$5.63	$22.62	$63.33
Ind. Labor & Material	0.35	$11.58	$0.00	$0.68	$12.26
State Sales Tax	0.00	$0.00	$0.21	$0.87	$1.08
QA/QC Impact	0.07	$2.33	$0.28	$1.17	$3.78
	1.50	$48.99	$6.12	$25.34	$80.45
Labor Contingency	0.37		Contractor Cost (0.15)		$12.07
			Contingency (0.25)		$23.13
Task 23115 Total	1.87				$115.65
Subject 23110 Total	1.87				$115.65
Category 23000 Total	186.55				$10,025.10
Area 20000 Total	186.55				$10,025.10
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	15.18	$420.35	$86.18	$344.71	$851.24
Ind. Labor & Material	5.01	$138.72	$0.00	$10.34	$149.06
State Sales Tax	0.00	$0.00	$7.23	$9.31	$16.54
QA/QC Impact	1.01	$27.95	$4.31	$17.75	$50.01
	21.20	$587.02	$93.72	$386.11	$1,066.85
Labor Contingency	6.36		Contractor Cost (0.15)		$160.03
			Contingency (0.30)		$368.07
Task 30010 Total	27.56				$1,594.95
Subject 30010 Total	27.56				$1,594.95
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	8.22	$227.53	$46.66	$186.65	$460.84
Ind. Labor & Material	2.71	$75.08	$0.00	$5.60	$80.68
State Sales Tax	0.00	$0.00	$1.75	$7.21	$8.96
QA/QC Impact	0.55	$15.13	$2.33	$9.61	$27.07
	11.48	$317.74	$50.74	$209.07	$577.55
Labor Contingency	3.44		Contractor Cost (0.15)		$86.63
			Contingency (0.30)		$199.25
Task 30080 Total	14.92				$863.43
Subject 30080 Total	14.92				$863.43
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.10	$113.64	$23.29	$93.18	$230.11
Ind. Labor & Material	1.35	$37.50	$0.00	$2.80	$40.30
State Sales Tax	0.00	$0.00	$0.87	$3.60	$4.47
QA/QC Impact	0.27	$7.56	$1.16	$4.80	$13.52
	5.73	$158.70	$25.32	$104.38	$288.40
Labor Contingency	1.43		Contractor Cost (0.15)		$43.27
			Contingency (0.25)		$82.93
Task 30106 Total	7.16				$414.60
Subject 30100 Total	7.16				$414.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	3.65	$101.01	$20.71	$82.83	$204.55
Ind. Labor & Material	1.20	$33.33	$0.00	$2.48	$35.81
State Sales Tax	0.00	$0.00	$0.78	$2.20	$3.28
QA/QC Impact	0.24	$6.72	$1.04	$4.27	$12.03
	5.09	$141.06	$22.53	$92.78	$256.37
Labor Contingency	1.27		Contractor Cost (0.15)		$38.45
			Contingency (0.25)		$73.72
Task 30116 Total	6.37				$368.54
Subject 30110 Total	6.37				$368.54
Category 30000 Total	56.01				$3,241.52
Area 30000 Total	56.01				$3,241.52
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	162.00	$4,485.60	$2,282.85	$637.20	$7,405.65
Ind. Labor & Material	53.46	$1,480.25	$0.00	$19.12	$1,499.37
State Sales Tax	0.00	$0.00	$85.61	$24.61	$110.22
QA/QC Impact	10.77	$298.29	$114.14	$32.82	$445.25
	226.23	$6,264.14	$2,482.60	$713.75	$9,460.49
Labor Contingency	56.56		Contractor Cost (0.15)		$1,419.08
			Contingency (0.25)		$2,719.90
Task 41070 Total	282.79				$13,599.47
Subject 41070 Total	282.79				$13,599.47
Category 41000 Total	282.79				$13,599.47
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$8.83	$224.88
State Sales Tax	0.00	$0.00	$24.75	$8.82	$33.57
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$127.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33		Contractor Cost (0.15)		$11.20
			Contingency (0.40)		$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	610.18	$17,067.67	$15,606.11	$9,658.09	$42,331.87
Ind. Labor & Material	201.36	$5,632.33	$0.00	$289.74	$5,922.07
State Sales Tax	0.00	$0.00	$585.22	$373.04	$958.26
QA/QC Impact	40.58	$1,135.00	$780.31	$497.39	$2,412.70
	852.11	$23,835.00	$16,971.64	$10,818.26	$51,624.90
Labor Contingency	340.84		Contractor Cost (0.15)		$7,743.74
			Contingency (0.40)		$23,747.45
Task 43300 Total	1192.96				$83,116.09
Subject 43300 Total	1192.96				$83,116.09
Category 43000 Total	1395.03				$94,092.91
Area 40000 Total	1677.82				$107,692.38
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	180.35	$4,994.18	$724.73	$370.64	$6,089.55
Ind. Labor & Material	59.51	$1,648.08	$0.00	$11.12	$1,659.20
State Sales Tax	0.00	$0.00	$27.18	$14.32	$41.50
QA/QC Impact	11.99	$332.11	$36.24	$19.09	$387.44
	251.86	$6,974.37	$788.15	$415.17	$8,177.69
Labor Contingency	62.96		Contractor Cost (0.15)		$1,226.66
			Contingency (0.25)		$2,321.07
Task 51011 Total	314.82				$11,755.44
Subject 51010 Total	314.82				$11,755.44
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	291.47	$9,343.50	$793.81	$644.80	$10,782.11
Ind. Labor & Material	96.19	$3,083.36	$0.00	$19.34	$3,102.70
State Sales Tax	0.00	$0.00	$29.77	$24.91	$54.68
QA/QC Impact	19.38	$621.34	$39.69	$33.21	$694.24
	407.04	$13,048.20	$863.27	$722.26	$14,633.73
Labor Contingency	122.11		Contractor Cost (0.15)		$2,195.07
			Contingency (0.30)		$5,048.63
Task 51031 Total	529.16				$21,877.43
Subject 51030 Total	529.16				$21,877.43
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	82.43	$2,559.53	$153.95	$340.84	$3,054.32
Ind. Labor & Material	30.50	$844.64	$0.00	$10.23	$854.87
State Sales Tax	0.00	$0.00	$5.78	$13.17	$18.95
QA/QC Impact	6.15	$170.21	$7.70	$17.55	$195.46
	129.09	$3,574.38	$167.43	$381.79	$4,123.60
Labor Contingency	32.27		Contractor Cost (0.15)		$618.54
			Contingency (0.25)		$1,185.54
Task 51040 Total	161.36				$5,927.68
Subject 51040 Total	161.36				$5,927.68
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	149.78	$4,152.46	$4,239.96	$3,155.52	$11,547.94
Ind. Labor & Material	49.49	$1,370.31	$0.00	$67.67	$1,764.98
State Sales Tax	0.00	$0.00	$158.99	$121.88	$280.87
QA/QC Impact	9.97	$276.14	$212.00	$162.51	$650.65
	209.42	$5,798.91	$4,610.95	$3,534.58	$13,944.44
Labor Contingency	62.83		Contractor Cost (0.15)		$2,091.67
			Contingency (0.30)		$4,810.84
Task 51050 Total	272.25				$20,846.95
Subject 51050 Total	272.25				$20,846.95
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	10.51	$291.18	$940.56	$409.97	$1,641.71
Ind. Labor & Material	3.47	$96.09	$0.00	$12.30	$108.39
State Sales Tax	0.00	$0.00	$35.28	$15.84	$51.12
QA/QC Impact	0.70	$19.36	$47.02	$21.11	$87.49
	14.68	$406.63	$1,022.86	$459.22	$1,888.71
Labor Contingency	3.67		Contractor Cost (0.15)		$283.31
			Contingency (0.25)		$543.00
Task 51070 Total	18.35				$2,715.02
Subject 51070 Total	18.35				$2,715.02
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.58	$18.86	$185.29	$3.28	$207.43
Ind. Labor & Material	0.19	$6.22	$0.00	$0.10	$6.32
State Sales Tax	0.00	$0.00	$6.95	$0.13	$7.08
QA/QC Impact	0.04	$1.25	$9.27	$0.17	$10.69

COST ACCOUNT		LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)			
		0.80	$26.33	$201.51	$3.68	$231.52
Labor Contingency		0.20		Contractor Cost (0.15)		$34.72
				Contingency (0.25)		$66.56
Task	51080 Total	1.01				$332.80
Subject	51080 Total	1.01				$332.80
51090 Operations Support Facility						
51090 Operations Support Facility						
Direct Cost		0.51	$17.46	$820.67	$101.95	$940.08
Ind. Labor & Material		0.17	$5.76	$0.00	$3.06	$8.82
State Sales Tax		0.00	$0.00	$30.78	$3.94	$34.72
QA/QC Impact		0.03	$1.16	$41.03	$5.25	$47.44
		0.72	$24.38	$892.48	$114.20	$1,031.06
Labor Contingency		0.18		Contractor Cost (0.15)		$154.66
				Contingency (0.25)		$296.43
Task	51090 Total	0.89				$1,482.15
Subject	51090 Total	0.89				$1,482.15
51100 Contamination Control System						
51100 Contamination Control System						
Direct Cost		117.76	$3,868.51	$705.29	$719.47	$5,293.27
Ind. Labor & Material		38.86	$1,276.61	$0.00	$21.58	$1,298.19
State Sales Tax		0.00	$0.00	$26.45	$27.79	$54.24
QA/QC Impact		7.83	$257.26	$35.26	$37.05	$329.57
		164.45	$5,402.38	$767.00	$805.89	$6,975.27
Labor Contingency		49.34		Contractor Cost (0.15)		$1,046.30
				Contingency (0.30)		$2,406.47
Task	51100 Total	213.79				$10,428.04
Subject	51100 Total	213.79				$10,428.04
Category	51000 Total	1511.62				$75,365.51
52000 UTILITIES						
52010 Electrical						
52010 Electrical						
Direct Cost		37.20	$1,267.40	$5,120.52	$265.88	$6,653.80
Ind. Labor & Material		12.28	$418.24	$0.00	$7.98	$426.22
State Sales Tax		0.00	$0.00	$192.02	$10.27	$202.29
QA/QC Impact		2.47	$84.28	$256.03	$13.69	$354.00
		51.95	$1,769.92	$5,568.57	$297.82	$7,636.31
Labor Contingency		12.99		Contractor Cost (0.15)		$1,145.44
				Contingency (0.25)		$2,195.45
Task	52010 Total	64.94				$10,977.20
Subject	52010 Total	64.94				$10,977.20
52020 Communications						
52020 Communications						
Direct Cost		5.33	$181.71	$2.58	$16.53	$200.82
Ind. Labor & Material		1.76	$59.96	$0.00	$0.50	$60.46
State Sales Tax		0.00	$0.00	$0.10	$0.64	$0.74
QA/QC Impact		0.35	$12.08	$0.13	$0.85	$13.06
		7.45	$253.75	$2.81	$18.52	$275.08
Labor Contingency		2.23		Contractor Cost (0.15)		$41.26
				Contingency (0.30)		$94.91
Task	52020 Total	9.68				$411.25
Subject	52020 Total	9.68				$411.25
52040 Chilled Water						
52040 Chilled Water						
Direct Cost		135.22	$3,744.02	$14,637.55	$6,959.17	$25,340.74
Ind. Labor & Material		44.62	$1,235.53	$0.00	$208.78	$1,444.31
State Sales Tax		0.00	$0.00	$548.91	$268.80	$817.71
QA/QC Impact		8.99	$248.98	$731.87	$358.40	$1,339.25
		188.83	$5,228.53	$15,918.33	$7,795.15	$28,942.01
Labor Contingency		56.65		Contractor Cost (0.15)		$4,341.31
				Contingency (0.30)		$2,985.00
Task	52040 Total	245.48				$43,268.32
Subject	52040 Total	245.48				$43,268.32
Category	52000 Total	320.10				$54,656.77
53000 MONITORING						
53000 MONITORING						
53000 MONITORING						
Direct Cost		129.04	$4,186.11	$1,233.76	$2,788.50	$8,208.37
Ind. Labor & Material		42.58	$1,381.42	$0.00	$83.66	$1,465.08
State Sales Tax		0.00	$0.00	$46.26	$107.71	$153.97
QA/QC Impact		8.58	$278.38	$61.69	$143.61	$483.68
		180.21	$5,845.91	$1,341.71	$3,123.48	$10,311.10
Labor Contingency		63.07		Contractor Cost (0.15)		$1,546.67
				Contingency (0.35)		$4,150.21
Task	53000 Total	243.28				$16,007.98
Subject	53000 Total	243.28				$16,007.98
Category	53000 Total	243.28				$16,007.98
Area	50000 Total	2075.00				$146,030.26

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 3995.38 x 10^3 man-hrs $266,989.26

Case 4

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Summary Cost Matrix (Table 1)

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Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

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Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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TABLE 1, MRS SYSTEMS STUDY - CASE 4 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$280.09	$27.30	$26.53	$53.83	$16.57	$6.87	$23.43	$357.35
	1000	SUPPORT CONTRACTOR	$43.21	$0.00	$0.00	$0.00	$3.31	$0.90	$4.21	$47.42
	1010	Surface	$27.28			$0.00		$0.90	$0.90	
	1020	Subsurface	$15.93			$0.00	$3.31		$3.31	
	2000	ARCHITECT-ENGINEER	$172.84	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26	$3.58	$16.84	$189.68
	2010	Surface	$109.13	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$63.71	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26		$13.26	
	3000	CONSTRUCTION MANAGEMENT	$63.03	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$65.42
	3010	Surface	$39.83	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$23.20			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.30	$0.53	$3.83			$0.00	$3.83
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$92.30	$16.29	$108.59	$1.51	$39.85	$41.36	$327.97
	11000	EMPLOYEE TRANSPORTATION		$84.41	$13.95	$98.36	$1.20		$1.20	$99.56
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$412.47	$1,749.78	$220.64	$1,970.41	$43.75	$34.11	$77.86	$2,460.75
4.3.2.1	21000	WASTE HANDLING FACILITY	$275.86	$726.09	$32.60	$758.69	XXXXXXXXXX	$26.73	$26.73	$1,061.28
	21100	Waste Handling Building 1:	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	$0.00	
4.3.2.1.2	21102	Building/Structures	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$0.00			$0.00	XXXXXXXXXX		$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 4 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$229.48	$0.00	$0.00	$0.00	XXXXXXXXXXX	$22.41	$22.41	
4.3.2.1.9	21202	Building/Structures	$108.95			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$29.59			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$16.39			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$10.35			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$57.37			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$6.83			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$46.38	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.32	$4.32	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.89			$0.00	XXXXXXXXXXX	$1.81	$1.81	
	21502	Vehicle Wash Facility	$0.93			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.48			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$89.19	$996.92	$172.57	$1,169.49	$32.38	$4.67	$37.05	$1,295.73
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.03		$19.03	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.60			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$11.13			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.09			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$11.36	$2.71	$14.07	$103.74
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$10.93	$0.67	$11.60	
	23011	Headframe -	$6.56	$25.72	$14.32	$40.04	$10.93		$10.93	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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05-Jan-89 REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 4 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS) SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.15	$2.04	$2.19	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.15		$0.15	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.15	$0.00	$0.15	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.15		$0.15	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.13		$0.13	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.68	XXXXXXXXXXX	$3.68	$99.87
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.81	XXXXXXXXXXX	$1.81	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.98	XXXXXXXXXXX	$0.98	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXX	$0.47	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXX	$0.47	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXX	$0.42	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXX	$0.42	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$151.22	$961.82	$49.47	$1,011.29	$122.63	XXXXXXXXXXX	$122.63	$1,285.14
4.3.4.1	41000	DEVELOPMENT	$130.46	$740.92	$47.02	$787.95	$15.44	XXXXXXXXXXX	$15.44	$933.84
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$84.55	$538.73	XXXXXXXXXXX	$538.73	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXX	$14.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXX	$47.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXX	$22.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41024	Emplacement Drifts	$28.31	$223.24	XXXXXXXXXXX	$223.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$22.62	$231.06	XXXXXXXXXXX	$231.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41060	Excavated Material Handling	$13.02	$33.62	$0.00	$33.62	$0.00	XXXXXXXXXXX	$0.00	
	41070	General Maintenance	$9.20	$74.80	$47.02	$121.83	$15.44	XXXXXXXXXXX	$15.44	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.76	$220.90	$2.45	$223.35	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$244.11
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$155.48	$0.00	$155.48	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.93	$1.47	$0.00	$1.47	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	

C:\LOTUS\TAB1-4RE
05-Jan-89 REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 4 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$107.19	XXXXXXXXXXXX	$107.19	$107.19
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$4.98	XXXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$3.04	XXXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.69	XXXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.59	XXXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.56	XXXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.12	XXXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$96.21	XXXXXXXXXXXX	$96.21	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$105.26	$728.53	$197.29	$925.82	$164.81	XXXXXXXXXXXX	$164.81	$1,195.90
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$82.55	$586.30	$116.51	$702.81	$85.75	XXXXXXXXXXXX	$85.75	$871.11
4.3.5.1.1	51010	Material Support, Receiving/Warehousing	$12.96	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXXX	$13.32	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXXX	$13.32	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$43.12	$389.14	$33.44	$422.58	$24.79	XXXXXXXXXXXX	$24.79	
	51031	Development Area	$42.12	$271.49	$24.42	$295.91	$24.79	XXXXXXXXXXXX	$24.79	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$6.64	XXXXXXXXXXXX	$6.64	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.23	$29.18	$10.96	$40.15	$24.04	XXXXXXXXXXXX	$24.04	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$8.77	$45.85	$0.00	$45.85	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.7	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$3.08	XXXXXXXXXXXX	$3.08	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.38	XXXXXXXXXXXX	$0.38	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.68	XXXXXXXXXXXX	$1.68	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$11.82	XXXXXXXXXXXX	$11.82	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$60.92	XXXXXXXXXXXX	$60.92	$124.20
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$12.39	XXXXXXXXXXXX	$12.39	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.46	XXXXXXXXXXXX	$0.46	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$48.07	XXXXXXXXXXXX	$48.07	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$18.14	XXXXXXXXXXXX	$18.14	$200.59
		TOTAL REPOSITORY	$1,192.63	$3,574.42	$526.15	$4,100.57	$352.95	$80.83	$433.77	$5,726.97
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXX	$1,275.36	$8.74	$1,284.10	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$1,284.10
	61000	SPENT FUEL	XXXXXXXXXXXXXX	$983.32	$0.00	$983.32	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$983.32
	61010	Intact PWR	XXXXXXXXXXXXXX	$78.86		$78.86	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXX	$904.46		$904.46	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXX	$215.56		$215.56	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$215.56
	63000	OTHER WASTE	XXXXXXXXXXXXXX	$76.48	$8.74	$85.22	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$85.22
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63030	WWHLW and CHLW	XXXXXXXXXXXXXX	$5.10		$5.10	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXX	$65.00		$65.00	XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	99999	TOTAL REPOSITORY, with EMPLACEMENT CONTAINERS	$1,192.63	$4,849.79	$534.88	$5,384.67	$352.95	$80.83	$433.77	$7,011.07

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 4
(DOLLARS IN THOUSANDS - 1IIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.5	2,383.5	0.0	3,021.0	637.5	89.4	25%	937.0	4,684.9	320.1	5,005.0	10%	365.9	18.3	96.1	480.3	5,485.3
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9	25%	588.1	2,940.6	200.6	3,141.2	10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0	25%	79.4	396.8	27.2	424.0	10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.1	0.0	0.0	822.1	822.1	0.0	20%	328.8	1,973.0	138.1	2,111.1	5%	82.2	4.1	17.3	103.6	2,214.7
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0	20%	696.1	4,176.5	292.4	4,468.9	5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3	20%	36.5	218.8	15.2	234.0	5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0	20%	143.5	860.9	60.3	921.2	5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.9	448.4	0.0	697.3	248.9	16.8	20%	192.6	1,155.6	79.5	1,235.1	5%	47.3	2.4	9.9	59.6	1,294.7
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,327.9	9,219.8	2,076.1	267.9	30%	3,469.1	15,032.9	1,027.9	16,060.8	15%	1,694.4	84.7	533.7	2,312.8	18,373.6
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.4	0.0	41.9	16.5	1.0	20%	11.9	71.3	4.9	76.2	5%	2.9	0.1	0.6	3.6	79.8
4.3.1		SUBTOTAL 120 - ON SITE	222.4	$6,383.6	$6,316.3	$5,501.5	$18,201.4	$6,383.6	$443.3		$6,483.0	$31,511.3	$2,166.2	$33,677.5		$2,672.0	$133.7	$771.9	$3,577.6	$37,255.1
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1	25%	2,294.6	11,473.0	784.7	12,257.7	10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8	30%	1,598.4	6,926.5	477.0	7,403.5	15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.5	68,508.6	0.0	82,398.1	13,889.5	2,569.1	25%	24,714.2	123,570.9	8,425.2	131,996.1	10%	9,628.8	481.4	2,527.6	12,637.8	144,633.9
	130.50	OFF SITE - UTILITIES	39.1	1,133.4	949.5	224.7	2,307.6	1,133.4	44.0	30%	1,045.5	4,530.5	313.1	4,843.6	15%	516.2	25.8	162.6	704.6	5,548.2
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0	25%	6,961.1	34,805.6	2,386.7	37,192.3	10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.7	$24,233.4	$92,517.9	$230.0	$116,981.3	$24,233.4	$3,478.0		$36,613.8	$181,306.5	$12,386.7	$193,693.2		$14,555.7	$727.7	$3,889.3	$19,172.7	$212,865.9
		TOTAL 100 - SITE	1,058.1	$30,617.0	$98,834.2	$5,731.5	$135,182.7	$30,617.0	$3,921.3		$43,096.8	$212,817.8	$14,552.9	227,370.7		$17,227.7	$861.4	$4,661.2	$22,750.3	$250,121.0
	211.02	WHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.03	WHB I - HOT CELL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.04	WHB I - UTILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.05	WHB I - HVAC EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.06	WHB I - HANDL/PACK EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.07	WHB I - SUPPORT FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
		SUBTOTAL 211 - WHB I	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	WHB II - BUILDING/STRUCT	894.1	25,927.9	23,753.6	1,274.0	50,955.5	25,927.9	938.5	40%	31,128.8	108,950.7	7,534.6	116,485.3	25%	19,220.9	961.0	8,072.8	28,254.7	144,740.0
	212.03	WHB II - HOT CELL EQUIP	114.4	3,318.2	0.0	13,976.2	17,294.4	3,318.2	524.1	40%	8,454.7	29,591.4	2,020.0	31,611.4	25%	5,153.2	257.7	2,164.4	7,575.3	39,186.7
	212.04	WHB II - UTILITIES	143.3	3,951.5	1,474.5	2,191.8	7,617.8	3,951.5	137.5	40%	4,682.7	16,389.5	1,133.8	17,523.3	25%	2,892.3	144.6	1,214.8	4,251.7	21,775.0
	212.05	WHB II - HVAC EQUIPMENT	63.6	1,844.0	2,055.3	1,516.8	5,416.1	1,844.0	134.0	40%	2,957.6	10,351.7	711.5	11,063.2	25%	1,815.0	90.8	762.3	2,668.1	13,731.3
	212.06	WHB II - HANDL/PACK EQUIP	189.5	5,495.2	0.0	28,907.4	34,402.6	5,495.2	1,084.0	40%	16,392.7	57,374.5	3,910.0	61,284.5	25%	9,974.5	498.7	4,189.3	14,662.5	75,947.0
	212.07	WHB II - SUPPORT FAC.	14.7	427.2	0.0	3,880.8	4,308.0	427.2	145.5	40%	1,952.3	6,833.0	464.1	7,297.1	25%	1,183.8	59.2	497.2	1,740.2	9,037.3
		SUBTOTAL 212 - WHB II	1,419.6	$40,964.0	$27,283.4	$51,747.0	$119,994.4	$40,964.0	$2,963.6		$65,568.8	$229,490.8	$15,774.0	$245,264.8		$40,239.7	$2,012.0	$16,900.8	$59,152.5	$304,417.3
	215.01	WASTE TREATMENT BUILDING	122.1	3,540.7	2,876.9	4,681.5	11,099.1	3,540.7	283.4	40%	5,969.3	20,892.5	1,434.7	22,327.2	25%	3,660.0	183.0	1,537.2	5,380.2	27,707.4
	215.02	VEHICLE WASH FACILITY	5.6	163.6	224.2	152.0	539.8	163.6	14.1	30%	215.3	932.8	64.0	996.8	15%	105.5	5.3	33.2	144.0	1,140.8
	215.03	DECONTAMINATION BUILDING	20.1	582.8	933.8	519.7	2,036.3	582.8	54.5	30%	802.1	3,475.7	238.3	3,714.0	15%	392.9	19.6	123.8	536.3	4,250.3
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.6	10,756.9	4,045.2	251.7	40%	6,021.5	21,075.3	1,450.6	22,525.9	25%	3,700.5	185.0	1,554.2	5,439.7	27,965.6
		SUBTOTAL 215 - OTHER	287.5	$8,332.3	$7,600.0	$8,499.8	$24,432.1	$8,332.3	$603.7		$13,008.2	$46,376.3	$3,187.6	$49,563.9		$7,858.9	$392.9	$3,248.4	$11,500.2	$61,064.1
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	1,707.1	$49,296.3	$34,883.4	$60,246.8	$144,426.5	$49,296.3	$3,567.3		$78,577.0	$275,867.1	$18,961.6	$294,828.7		$48,098.6	$2,404.9	$20,149.2	$70,652.7	$365,481.4

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 4
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR DA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.1	888.9	1,875.2	509.2	51.2 25%	608.9	3,044.5	208.6	3,253.1 10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2 25%	303.3	1,516.4	104.6	1,621.0 10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.8	568.0	803.2	1,986.0	614.8	51.4 30%	795.7	3,447.9	236.7	3,684.6 15%	390.1	19.5	122.9	532.5	4,217.1
	220.40	MAINTENANCE FACILITIES	50.2	1,454.6	1,858.6	426.1	3,739.3	1,454.6	85.7 25%	1,319.9	6,599.5	454.5	7,054.0 10%	519.4	26.0	136.4	681.8	7,735.8
	220.50	ADMIN/PERSONNEL FACILITIES	92.9	2,692.8	2,500.7	563.6	5,757.1	2,692.8	114.9 30%	2,569.4	11,134.2	768.9	11,903.1 15%	1,267.5	63.4	399.3	1,730.2	13,633.3
	220.60	MOCK-UP BUILDING	20.6	595.9	957.0	501.3	2,054.2	595.9	54.7 30%	811.4	3,516.2	241.2	3,757.4 15%	397.5	19.9	125.2	542.6	4,300.0
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.2	4,477.5	375.5	7,327.2	2,474.2	182.0 25%	2,495.9	12,479.3	857.6	13,336.9 10%	980.1	49.0	257.3	1,286.4	14,623.3
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1 25%	150.7	753.4	51.9	805.3 10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.6	222.1	3,348.0	4,009.7	439.6	133.9 30%	1,375.0	5,958.2	404.9	6,363.1 15%	667.4	33.4	210.2	911.0	7,274.1
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5 30%	451.6	1,957.0	135.1	2,092.1 15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.4	61.0	37.2	0.9 25%	24.8	123.9	8.6	132.5 10%	9.8	0.5	2.6	12.9	145.4
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6 25%	195.5	977.4	66.3	1,043.7 10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.7	2,925.2	4,046.8	1,078.9	111.3 25%	1,309.3	6,546.3	448.5	6,994.8 10%	512.6	25.6	134.6	672.8	7,667.6
	221.90	SEWAGE FACILITY	15.1	439.0	419.4	8.4	866.8	439.0	16.0 25%	330.5	1,652.3	114.3	1,766.6 10%	130.6	6.5	34.3	171.4	1,938.0
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1 30%	4,683.5	20,295.2	1,374.8	21,670.0 15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.7	0.0	5,186.5	5,210.2	23.7	194.5 25%	1,357.1	6,785.5	458.0	7,243.5 10%	523.4	26.2	137.4	687.0	7,930.5
	222.42	BATCH PLANT	10.2	296.2	0.5	1,273.0	1,569.7	296.2	47.8 25%	478.4	2,392.1	163.3	2,555.4 10%	186.6	9.3	49.0	244.9	2,800.3
4.3.2.2		TOTAL 220 - BALANCE OF PLANT	432.4	$12,537.3	$12,825.7	$30,397.3	$55,760.3	$12,537.3	$1,620.8	$19,260.9	$89,179.3	$6,097.8	$95,277.1	$8,566.8	$428.4	$2,522.6	$11,517.8	$106,794.9
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.8	159.1	35.6	348.5	153.8	7.3 30%	152.9	662.5	45.7	708.2 15%	75.3	3.8	23.7	102.8	811.0
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1,221.7	1,857.2	503.3	3,582.2	1,221.7	88.5 35%	1,712.3	6,604.7	454.0	7,058.7 20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.5	6,572.4	6,041.1	17,455.0	4,841.5	473.0 35%	7,969.3	30,738.8	2,107.0	32,845.8 20%	4,459.3	223.0	1,638.8	6,321.1	39,166.9
		TOTAL 230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8	$9,834.5	$38,006.0	$2,606.7	$40,612.7	$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0		GRAND TOTAL SURFACE FACILITIES	3,412.0	$98,667.6	$155,132.0	$102,955.6	$356,755.2	$98,667.6	$9,678.2	$150,769.2	$615,870.2	$42,219.0	$658,089.2	$79,388.5	$3,969.5	$29,348.6	$112,706.6	$770,795.8

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 4
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	4	7	9	12	15	16	16	16	
BUSES AT $100.0 K per YEAR	COST	$200	$400	$700	$900	$1,200	$1,500	$1,600	$32,000	$1,600	$40,100
	SUBTOTAL - 100	$226	$426	$726	$1,160	$1,460	$1,760	$1,860	$37,200	$1,860	$46,678
CONTINGENCY @ 20%		$45	$85	$145	$232	$292	$352	$372	$7,440	$372	$9,336
	TOTAL - 100	$271	$511	$871	$1,392	$1,752	$2,112	$2,232	$44,640	$2,232	$56,014
210 - WASTE HANDLING FACILITIES											
LABOR :	# of PEOPLE	15	38	64	89	116	142	149	149	149	
COST PER YR/ PERSON $52,700	COST	$791	$2,003	$3,373	$4,690	$6,113	$7,483	$7,852	$157,046	$7,852	$197,203
OPERATING SUPPLIES @ 5.0% of LABOR		$40	$100	$169	$235	$306	$374	$393	$7,852	$393	$9,860
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$1,825	$1,825	$1,825	$10,950	$10,950	$10,950	$10,950	$219,000	$10,950	$279,225
Capital Cost = 365 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$1,865	$1,925	$1,994	$11,185	$11,256	$11,324	$11,343	$226,852	$11,343	$289,085
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	1.7	1.7	1.7	17	17	17	17	17	17	
@ $.05/Kwhr	COST	$85	$85	$85	$850	$850	$850	$850	$17,000	$850	$21,505
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$70	$72	$75	$419	$422	$425	$425	$8,507	$425	$10,841
	SUBTOTAL - 210	$2,810	$4,085	$5,526	$17,144	$18,641	$20,082	$20,470	$409,405	$20,470	$518,634
CONTINGENCY @ 40%		$1,124	$1,634	$2,210	$6,858	$7,456	$8,033	$8,188	$163,762	$8,188	$207,454
	TOTAL - 210	$3,934	$5,719	$7,737	$24,002	$26,097	$28,115	$28,658	$573,167	$28,658	$726,088
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	45	120	194	267	359	433	470	470	470	
COST PER YR/ PERSON $52,700	COST	$2,372	$6,324	$10,224	$14,071	$18,919	$22,819	$24,769	$495,380	$24,769	$619,647
OPERATING SUPPLIES @ 5.0% of LABOR		$119	$316	$511	$704	$946	$1,141	$1,238	$24,769	$1,238	$30,982
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$775	$775	$775	$3,100	$3,100	$3,100	$3,100	$62,000	$3,100	$79,825
Capital Cost = 155 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$894	$1,091	$1,286	$3,804	$4,046	$4,241	$4,338	$86,769	$4,338	$110,807
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.5	2.5	2.5	25.5	25.5	25.5	25.5	25.5	25.5	
@ $.05/Kwhr	COST	$125	$125	$125	$1,275	$1,275	$1,275	$1,275	$25,500	$1,275	$32,250
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$34	$41	$48	$143	$152	$159	$163	$3,254	$163	$4,155
	SUBTOTAL - 220	$3,424	$7,581	$11,683	$19,292	$24,392	$28,494	$30,545	$610,903	$30,545	$766,859
CONTINGENCY @ 30%		$1,027	$2,274	$3,505	$5,788	$7,318	$8,548	$9,164	$183,271	$9,164	$230,058
	TOTAL - 220	$4,451	$9,855	$15,188	$25,080	$31,710	$37,042	$39,709	$794,174	$39,709	$996,917
TOTAL ANNUAL O & M COST		$8,656	$16,086	$23,796	$50,474	$59,559	$67,269	$70,599	$1,411,981	$70,599	$1,779,019

DATE : 07-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 4
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	10	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$1,000	$4,600	$100	$5,700	$1,000	$46,800
	SUBTOTAL - 100	$1,078	$6,394	$178	$7,650	$1,260	$55,588
CONTINGENCY @ 20%		$216	$1,279	$36	$1,530	$252	$11,118
	TOTAL - 100	$1,294	$7,673	$214	$9,180	$1,512	$66,706
210 - WASTE HANDLING FACILITIES							
LABOR :	# of PEOPLE	112	12	6		0	
COST PER YR/ PERSON $52,700	COST	$5,902	$14,545	$316	$20,764	$0	$217,967
OPERATING SUPPLIES @ 5.0% of LABOR		$295	$727	$16	$1,038	$0	$10,898
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$37	$840	$37	$913	$0	$280,138
Capital Cost = 365 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$332	$1,567	$52	$1,951	$0	$291,036
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$22,005
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$12	$59	$2	$73	$0	$10,914
	SUBTOTAL - 210	$6,266	$16,631	$390	$23,288	$0	$541,922
CONTINGENCY @ 40%		$2,507	$6,652	$156	$9,315	$0	$216,769
	TOTAL - 210	$8,773	$23,283	$547	$32,603	$0	$758,691
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	280	64	32		19	
COST PER YR/ PERSON $52,700	COST	$14,756	$77,574	$1,686	$94,017	$10,013	$723,676
OPERATING SUPPLIES @ 5.0% of LABOR		$738	$3,879	$84	$4,701	$501	$36,184
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$775	$17,825	$775	$19,375	$1,550	$100,750
Capital Cost = 155 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,513	$21,704	$859	$24,076	$2,051	$136,934
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$48,500
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$57	$814	$32	$903	$77	$5,135
	SUBTOTAL - 220	$16,876	$112,742	$3,128	$132,745	$14,641	$914,245
CONTINGENCY @ 30%		$5,063	$33,823	$938	$39,824	$4,392	$274,274
	TOTAL - 220	$21,938	$146,565	$4,066	$172,569	$19,033	$1,188,519
TOTAL ANNUAL O & M COST		$32,005	$177,520	$4,827	$214,352	$20,545	$2,013,915

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 4
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10% 82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE												
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10% 1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10% 245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE												
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.5	75%	100.4	505.9	35%	177.0	10% 68.3	0.0	(0.2)	751.0
	120.70	ON SITE - DRAINAGE CONTROL		0.0	0.0	0.0										
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10% 9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10% 48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10% 1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9	$457.9	$0.0	$0.8	$5,037.0
	130.11	OFF SITE - ROADS (NEW)														
	130.13	OFF SITE - BRIDGES														
	130.21	OFF SITE - RAIL (NEW)														
	130.50	OFF SITE - UTILITIES														
	140.00	MONUMENTS														
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
4.3.1	TOTAL 100 - SITE		60.9	$1,607.8	$271.5	$0.0	$1,879.3		$1,512.1	$3,391.4		$1,186.9	$457.9	$0.0	$0.8	$5,037.0
	211.02	WHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	75%	0.0	0.0	35%	0.0	10% 0.0	0.0	0.0	0.0
	211.03	WHB I - HOT CELL EQUIPMENT		INCLUDED ABOVE												
	211.04	WHB I - UTILITIES		INCLUDED ABOVE												
	211.05	WHB I - HVAC EQUIPMENT		INCLUDED ABOVE												
	211.06	WHB I - HANDL/PACK EQUIP		INCLUDED ABOVE												
	211.07	WHB I - SUPPORT FACILITIES		INCLUDED ABOVE												
		SUBTOTAL 211 - WHB I	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	WHB II - BUILDING/STRUCT	261.4	6,752.9	41.9	1,856.6	8,651.4	75%	5,064.7	13,716.1	35%	4,800.6	10% 1,851.7	2,036.8	(0.2)	22,405.0
	212.03	WHB II - HOT CELL EQUIP		INCLUDED ABOVE												
	212.04	WHB II - UTILITIES		INCLUDED ABOVE												
	212.05	WHB II - HVAC EQUIPMENT		INCLUDED ABOVE												
	212.06	WHB II - HANDL/PACK EQUIP		INCLUDED ABOVE												
	212.07	WHB II - SUPPORT FAC.		INCLUDED ABOVE												
		SUBTOTAL 212 - WHB II	261.4	$6,752.9	$41.9	$1,856.6	$8,651.4		$5,064.7	$13,716.1		$4,800.6	$1,851.7	$2,036.8	($0.2)	$22,405.0
	215.01	WASTE TREATMENT BUILDING	19.4	511.5	10.7	199.9	722.0	75%	383.6	1,105.6	35%	387.0	10% 149.3	164.2	(0.1)	1,806.0
	215.02	VEHICLE WASH FACILITY	0.9	25.3	0.0	0.0	25.3	75%	19.0	44.3	35%	15.5	10% 6.0	6.6	(0.4)	72.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10% 21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10% 179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	45.3	$1,195.9	$21.4	$524.9	$1,742.1		$896.9	$2,639.0		$923.7	$356.4	$391.9	($0.9)	$4,310.1
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		306.7	$7,948.8	$63.3	$2,381.5	$10,393.5		$5,961.6	$16,355.1		$5,724.3	$2,208.1	$2,428.7	($1.1)	$26,715.1

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 4
(DOLLARS IN THOUSANDS - IIIQTR88)

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BAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35% 40.4	10%	15.6	17.1	0.2	188.6
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35% 32.3	10%	12.5	13.7	0.1	150.8
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35% 51.7	10%	19.9	21.9	0.3	241.5
	220.40	MAINTENANCE FACILITIES	9.0	237.3	0.0	0.0	237.3	75%	178.0	415.3	35% 145.3	10%	56.1	61.7	(0.3)	678.1
	220.50	ADMIN/PERSONNEL FACILITIES	14.6	384.9	0.0	0.0	384.9	75%	288.7	673.6	35% 235.8	10%	90.9	100.0	0.5	1,100.8
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35% 66.2	10%	25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35% 129.2	10%	49.8	54.8	0.2	603.1
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35% 16.2	10%	6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35% 33.9	10%	13.1	14.4	(0.2)	158.1
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35% 45.2	10%	17.4	19.2	(0.1)	210.9
	221.10	EXPLOSIVE MAGAZINES	0.2	5.8	0.0	0.0	5.8	75%	4.4	10.2	35% 3.6	10%	1.4	1.5	0.3	17.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35% 5.5	10%	2.1	2.3	0.5	26.2
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35% 61.3	10%	23.7	26.0	0.3	286.6
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35% 33.2	10%	12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35% 74.3	10%	28.7	31.5	0.1	346.9
	222.30	STANDARD EQUIPMENT		0.0	0.0	0.0										
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35% 26.6	10%	10.2	11.3	0.4	124.4
4.3.2.2	TOTAL 220 - BALANCE OF PLANT		61.6	$1,624.5	$0.0	$0.0	$1,624.5		$1,234.5	$2,859.0	$1,000.7		$385.9	$424.5	$2.7	$4,672.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35% 19.4	10%	7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.2	355.2	35% 124.3	10%	48.0	52.8	(0.3)	580.0
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35% 436.0	10%	168.2	185.0	0.3	2,035.2
		TOTAL 230 - SURFACE SHAFT FAC.	35.9	$946.5	$0.0	$0.0	$946.5		$709.8	$1,656.3	$579.7		$223.7	$246.0	$0.2	$2,705.9
4.0		GRAND TOTAL SURFACE FACILITIES	465.1	$12,127.5	$334.8	$2,381.5	$14,843.8		$9,418.0	$24,261.8	$8,491.6		$3,275.6	$3,099.2	$2.6	$39,130.8

03-Nov-88

MRS SYSTEM STUDY - CASE 4
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
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WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTENTION ($1000s)	CONTINGENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	300	$17,000	$5,100	INCLUDED	$5,100
DHLW	DHLW	12,680	$17,000	$215,560	INCLUDED	$215,560
INTACT PWR	2C	2,544	$31,000	$78,864	INCLUDED	$78,864
INTACT PWR - WESTERN UTILITIES	2C	0	$31,000	$0	INCLUDED	$0
CONSOLIDATED PWR		0	$0	$0	INCLUDED	$0
INTACT BWR and/or PWR/BWR MIXED	2A	29,176	$31,000	$904,456	INCLUDED	$904,456
INTACT BWR - WESTERN UTILITIES	2A	0	$31,000	$0	INCLUDED	$0
CONSOLIDATED BWR		0	$0	$0	INCLUDED	$0
PWR HARDWARE		0	$0	$0	INCLUDED	$0
BWR HARDWARE		0	$0	$0	INCLUDED	$0
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		44,928		$1,210,364	$0	$1,210,364
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		45,240		$1,219,100	$0	$1,219,100
CONTACT HANDLED WASTE						$65,000
						$1,284,100

MRS STUDY CASES 2,4,6, AND 7
MANAGEMENT AND INTEGRATION COST ESTIMATE
task:2605A138
FILE = ENG-2467.WK1 (RANGE=MGTINT)
06-Oct-88 02:53 PM All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$38,682			
		EMPLACEMENT		$21,834			
		CARETAKER		$3,197			
		CLOSURE					$13,255
				$63,713	$0	$0	$13,255
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$15,928	$0	$0	$3,314
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $331,481 =====>		$23,204			
		of which	85%	$19,723 is labor			
		and	15%	$3,481 is materials and equipment.			
		Labor converts to at $100k per FTE.		197.23 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			29,031,300	5,251,300	
		CONSULTANT COST			$1,597	$289	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)	DURATION			24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)	PERSONS			605	109	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.	40 PER BUS			$36,289	$7,111	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$549.88	$0.00	$25.72	$575.60
State Sales Tax	0.00	$0.00	$37.87	$33.12	$70.99
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.53	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.54	$461.19
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.92	$337.99
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.12
			Contingency (0.30)		$1,607.08
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$443.33	$3,172.89
State Sales Tax	0.00	$0.00	$71.22	$55.79	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.14
			Contingency (0.30)		$5,555.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$9.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.23
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.36	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.99	$243.68
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.64	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.03
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT (All costs in thousands of dollars)	MATERIALS	TOTAL
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.87	$97.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.69	$0.00	$13.85	$198.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.89
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	218.96	$6,063.05	$5,763.68	$4,427.93	$16,254.66
Ind. Labor & Material	72.26	$2,000.81	$0.00	$132.84	$2,133.65
State Sales Tax	0.00	$0.00	$216.14	$171.03	$387.17
QA/QC Impact	14.56	$403.19	$288.18	$228.04	$919.41
	305.78	$8,467.05	$6,268.00	$4,959.84	$19,694.89
Labor Contingency	76.44		Contractor Cost (0.15)		$2,954.24
			Contingency (0.25)		$5,662.29
Task 41024 Total	382.22				$28,311.42
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	95.73	$2,650.64	$7,336.32	$2,582.15	$12,569.11
Ind. Labor & Material	31.59	$874.71	$0.00	$77.46	$952.17
State Sales Tax	0.00	$0.00	$275.12	$99.74	$374.86
QA/QC Impact	6.37	$176.27	$366.81	$132.98	$676.06
	133.69	$3,701.62	$7,978.25	$2,892.33	$14,572.20
Labor Contingency	46.79		Contractor Cost (0.15)		$2,185.84
			Contingency (0.35)		$5,865.31
Task 41025 Total	180.48				$22,623.35
Subject 41020 Total	851.59				$84,552.54
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$1,689.82	$0.00	$1,689.82
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$63.37	$0.00	$63.37
QA/QC Impact	0.00	$0.00	$84.49	$0.00	$84.49
	0.00	$0.00	$1,837.68	$0.00	$1,837.68
Labor Contingency	0.00		Contractor Cost (0.15)		$275.65
			Contingency (0.35)		$739.67
Task 41045 Total	0.00				$2,853.00
Subject 41040 Total	0.00				$2,853.00
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	62.57	$1,888.97	$3,388.64	$2,130.93	$7,408.54
Ind. Labor & Material	20.65	$623.36	$0.00	$63.93	$687.29
State Sales Tax	0.00	$0.00	$127.07	$82.31	$209.38
QA/QC Impact	4.16	$125.62	$169.44	$109.74	$404.80
	87.38	$2,637.95	$3,685.15	$2,386.91	$8,710.01
Labor Contingency	26.21		Contractor Cost (0.15)		$1,306.50
			Contingency (0.30)		$3,004.96
Task 41060 Total	113.59				$13,021.47
Subject 41060 Total	113.59				$13,021.47
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	66.17	$1,832.12	$3,410.11	$121.09	$5,363.32
Ind. Labor & Material	21.84	$604.60	$0.00	$3.63	$608.23
State Sales Tax	0.00	$0.00	$127.88	$7.68	$135.56
QA/QC Impact	4.40	$121.84	$170.51	$6.24	$298.59
	92.40	$2,558.56	$3,708.50	$135.64	$6,402.70
Labor Contingency	23.10		Contractor Cost (0.15)		$960.40
			Contingency (0.25)		$1,840.79
Task 41070 Total	115.51				$9,203.89
Subject 41070 Total	115.51				$9,203.89
Category 41000 Total	1263.70				$130,458.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.68	$0.00	$3.29	$15.27
State Sales Tax	0.00	$0.00	$227.97	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$2,325.37	$0.00	$2,325.37
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$87.20	$0.00	$87.20
QA/QC Impact	0.00	$0.00	$116.27	$0.00	$116.27
	0.00	$0.00	$2,528.84	$0.00	$2,528.84
Labor Contingency	0.00		Contractor Cost (0.15)		$379.33
			Contingency (0.35)		$1,017.86
Task 42030 Total	0.00				$3,926.03
Subject 42030 Total	0.00				$3,926.03
Category 42000 Total	2.09				$20,761.30
Area 40000 Total	1265.79				$151,219.41
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.65	$1,074.85
State Sales Tax	0.00	$0.00	$37.14	$2.97	$40.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$83.84	$83.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	545.42	$17,480.23	$2,230.17	$1,195.22	$20,905.62
Ind. Labor & Material	179.99	$5,768.48	$0.00	$35.86	$5,804.34
State Sales Tax	0.00	$0.00	$83.63	$46.17	$129.80
QA/QC Impact	36.27	$1,162.44	$111.51	$61.55	$1,335.50
	761.68	$24,411.15	$2,425.31	$1,338.80	$28,175.26
Labor Contingency	228.50		Contractor Cost (0.15)		$4,226.29
			Contingency (0.30)		$9,720.47
Task 51031 Total	990.19				$42,122.02
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.29
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	999.01				$43,121.53
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.78	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.64	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	13.46	$372.66	$24.21	$243.54	$640.41
Ind. Labor & Material	4.44	$122.88	$0.00	$7.41	$130.29
State Sales Tax	0.00	$0.00	$0.90	$9.41	$10.31
QA/QC Impact	0.89	$24.78	$1.21	$12.54	$38.53
	18.79	$520.42	$26.32	$272.80	$819.54
Labor Contingency	5.64		Contractor Cost (0.15)		$122.93
			Contingency (0.30)		$282.77
Task 51050 Total	24.43				$1,225.21
Subject 51050 Total	24.43				$1,225.21
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	80.82	$2,237.93	$1,851.62	$651.50	$4,741.05
Ind. Labor & Material	26.67	$738.52	$0.00	$19.54	$758.06
State Sales Tax	0.00	$0.00	$69.44	$25.16	$94.60
QA/QC Impact	5.37	$148.82	$92.58	$33.55	$274.95
	112.87	$3,125.27	$2,013.64	$729.75	$5,868.66
Labor Contingency	33.86		Contractor Cost (0.15)		$880.30
			Contingency (0.30)		$2,024.69
Task 51060 Total	146.73				$8,773.65
Subject 51060 Total	146.73				$8,773.65
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.21	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.49
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$51.97
			Contingency (0.25)		$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.26
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.69	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.95
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1588.89				$82,554.16
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$408.64	$0.00	$20.10	$430.04
State Sales Tax	0.00	$0.00	$108.13	$55.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.94	$31.93	$0.00	$0.59	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.52
			Contingency (0.30)		$56.39
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.99
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1801.63				$105,264.83

* TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT. 3762.82 x 10^3 man-hrs $331,480.50

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$116.85	$2,979.45
State Sales Tax	0.00	$0.00	$25.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.34
			Contingency (0.30)		$5,934.78
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$36.77	$529.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$314.21	$514.22
State Sales Tax	0.00	$0.00	$4.66	$18.20	$22.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$127.56	$184.89
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68		Contractor Cost (0.15)		$1,506.33
			Contingency (0.25)		$2,887.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.15	$3,922.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86		Contractor Cost (0.15)		$4,910.56
			Contingency (0.25)		$9,411.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87		Contractor Cost (0.15)		$2,393.30
			Contingency (0.25)		$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	2280.19	$63,139.50	$14,226.87	$46,111.64	$123,478.01
Ind. Labor & Material	752.46	$20,836.04	$0.00	$1,383.35	$22,219.39
State Sales Tax	0.00	$0.00	$533.51	$1,781.06	$2,314.57
QA/QC Impact	151.63	$4,198.78	$711.34	$2,374.75	$7,284.87
	3184.29	$88,174.32	$15,471.72	$51,650.80	$155,296.84
Labor Contingency	796.07		Contractor Cost (0.15)		$23,294.53
			Contingency (0.25)		$47,647.87
Task 41024 Total	3980.36				$223,239.21
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1572.69	$43,546.36	$37,241.04	$42,420.92	$123,208.32
Ind. Labor & Material	518.99	$14,370.30	$0.00	$1,272.63	$15,642.93
State Sales Tax	0.00	$0.00	$1,396.54	$1,638.51	$3,035.05
QA/QC Impact	104.58	$2,895.83	$1,862.06	$2,184.68	$6,942.57
	2196.26	$60,812.49	$40,499.64	$47,516.74	$148,828.87
Labor Contingency	768.69		Contractor Cost (0.15)		$22,324.34
			Contingency (0.35)		$59,903.63
Task 41025 Total	2964.96				$231,056.84
Subject 41020 Total	8152.38				$538,727.17
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.26	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33		Contractor Cost (0.15)		$8,851.18
			Contingency (0.35)		$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	14.44	$399.85	$331.89	$425.63	$1,157.37
Ind. Labor & Material	4.77	$131.92	$0.00	$12.77	$144.69
State Sales Tax	0.00	$0.00	$12.45	$16.44	$28.89
QA/QC Impact	0.96	$26.59	$16.59	$21.92	$65.10
	20.17	$558.39	$360.93	$476.76	$1,396.08
Labor Contingency	7.06		Contractor Cost (0.15)		$209.42
			Contingency (0.35)		$561.95
Task 41045 Total	27.22				$2,167.42
Subject 41040 Total	27.22				$2,167.42
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	176.15	$5,297.10	$10,627.35	$3,152.07	$19,076.52
Ind. Labor & Material	58.13	$1,748.04	$0.00	$94.56	$1,842.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$398.53	$121.75	$520.28
QA/QC Impact	11.71	$352.26	$531.37	$162.33	$1,045.96
	245.99	$7,397.40	$11,557.25	$3,530.71	$22,485.36
Labor Contingency	73.80		Contractor Cost (0.15)		$3,372.80
			Contingency (0.30)		$7,757.46
Task 41060 Total	319.79				$33,615.62
Subject 41060 Total	319.79				$33,615.62
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	816.87	$22,619.67	$7,699.00	$10,780.23	$41,098.90
Ind. Labor & Material	268.57	$7,464.49	$0.00	$323.41	$7,787.90
State Sales Tax	0.00	$0.00	$288.71	$416.39	$705.10
QA/QC Impact	54.32	$1,504.21	$384.95	$555.18	$2,444.34
	1140.76	$31,588.37	$8,372.66	$12,075.21	$52,036.24
Labor Contingency	285.19		Contractor Cost (0.15)		$7,805.45
			Contingency (0.25)		$14,960.43
Task 41070 Total	1425.95				$74,802.12
Subject 41070 Total	1425.95				$74,802.12
Category 41000 Total	11076.04				$740,921.97
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	351.53	$11,509.10	$41,432.98	$34,833.64	$87,775.72
Ind. Labor & Material	116.00	$3,798.00	$0.00	$1,045.01	$4,843.01
State Sales Tax	0.00	$0.00	$1,553.73	$1,345.45	$2,899.18
QA/QC Impact	23.38	$765.36	$2,071.65	$1,793.93	$4,630.94
	490.91	$16,072.46	$45,058.36	$39,018.03	$100,148.85
Labor Contingency	171.82		Contractor Cost (0.15)		$15,022.33
			Contingency (0.35)		$40,309.91
Task 42010 Total	662.73				$155,481.09
Subject 42010 Total	662.73				$155,481.09
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	3.32	$108.85	$391.87	$329.45	$830.17
Ind. Labor & Material	1.10	$35.92	$0.00	$9.88	$45.80
State Sales Tax	0.00	$0.00	$14.69	$12.72	$27.41
QA/QC Impact	0.22	$7.24	$19.59	$16.97	$43.80
	4.64	$152.01	$426.15	$369.02	$947.18
Labor Contingency	1.63		Contractor Cost (0.15)		$142.08
			Contingency (0.35)		$361.23
Task 42030 Total	6.27				$1,470.49
Subject 42030 Total	6.27				$1,470.49
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.92	$95.60	$0.00	$0.00	$95.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	951.22				$220,896.50
Area 40000 Total	12027.27				$961,818.47
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	222.37	$6,157.78	$0.00	$41.33	$6,199.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.56
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3738.04	$119,978.13	$5,112.87	$7,577.93	$132,668.93
Ind. Labor & Material	1233.55	$39,592.78	$0.00	$527.34	$39,820.12
State Sales Tax	0.00	$0.00	$191.74	$292.70	$484.44
QA/QC Impact	248.58	$7,978.55	$255.65	$390.26	$8,624.46

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	5220.18	$167,549.46	$5,560.26	$8,488.23	$181,597.95
Labor Contingency	1566.05		Contractor Cost (0.15)		$27,239.70
			Contingency (0.30)		$62,651.29
Task 51031 Total	6786.23				$271,488.94
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$49.05	$130.94	$179.99
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.96
Labor Contingency	686.05		Contractor Cost (0.15)		$11,804.70
			Contingency (0.30)		$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	9759.13				$389,142.41
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.49	$32.26	$47.14
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
Labor Contingency	86.84		Contractor Cost (0.15)		$1,647.73
			Contingency (0.25)		$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	354.47	$9,815.47	$1,698.19	$3,541.67	$15,055.33
Ind. Labor & Material	116.98	$3,239.11	$0.00	$106.25	$3,345.36
State Sales Tax	0.00	$0.00	$63.69	$136.80	$200.49
QA/QC Impact	23.57	$652.73	$84.91	$182.40	$920.04
	495.02	$13,707.31	$1,846.79	$3,967.12	$19,521.22
Labor Contingency	148.51		Contractor Cost (0.15)		$2,928.18
			Contingency (0.30)		$6,734.83
Task 51050 Total	643.53				$29,184.23
Subject 51050 Total	643.53				$29,184.23
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	462.09	$12,795.20	$8,197.24	$3,468.97	$24,461.41
Ind. Labor & Material	152.49	$4,222.42	$0.00	$104.07	$4,326.49
State Sales Tax	0.00	$0.00	$307.40	$133.99	$441.39
QA/QC Impact	30.73	$850.88	$409.87	$178.65	$1,439.40
	645.30	$17,868.50	$8,914.51	$3,885.68	$30,668.69
Labor Contingency	193.59		Contractor Cost (0.15)		$4,600.30
			Contingency (0.30)		$10,580.70
Task 51060 Total	838.90				$45,849.69
Subject 51060 Total	838.90				$45,849.69
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$94.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
Labor Contingency	9.79		Contractor Cost (0.15)		$755.49
			Contingency (0.25)		$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
Labor Contingency	0.54		Contractor Cost (0.15)		$92.60
			Contingency (0.25)		$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
Labor Contingency	0.95		Contractor Cost (0.15)		$426.70
			Contingency (0.25)		$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47		Contractor Cost (0.15)		$3,063.79
			Contingency (0.30)		$7,046.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax	0.00	$0.00	$0.18	$26.84	$27.02
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73		Contractor Cost (0.15)		$2,075.07
			Contingency (0.25)		$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	14114.42				$586,299.80
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$241.03	$1,451.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64		Contractor Cost (0.15)		$2,153.85
			Contingency (0.25)		$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.64	$2.92	$3.56
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46		Contractor Cost (0.15)		$159.64
			Contingency (0.30)		$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72		Contractor Cost (0.15)		$538.81
			Contingency (0.30)		$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.42	$0.00	$11.14	$141.56
State Sales Tax	0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact	0.95	$26.28	$1.97	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98		Contractor Cost (0.15)		$151.61
			Contingency (0.30)		$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.57	$10,365.32	$0.00	$543.04	$10,908.36
State Sales Tax	0.00	$0.00	$300.65	$699.16	$999.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37		Contractor Cost (0.15)		$10,928.80
			Contingency (0.35)		$25,525.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	16251.94				$728,526.14

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 29031.25 x 10^3 man-hrs $1,731,814.99

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$64.05	$1,614.60
State Sales Tax	0.00	$0.00	$21.68	$82.45	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$39.83	$574.15
State Sales Tax	0.00	$0.00	$12.45	$51.29	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.25
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	472.16	$13,074.11	$4,133.91	$8,890.18	$26,098.20
Ind. Labor & Material	155.81	$4,314.46	$0.00	$266.71	$4,581.17
State Sales Tax	0.00	$0.00	$155.02	$343.38	$498.40
QA/QC Impact	31.40	$869.43	$206.69	$457.84	$1,533.96
	659.37	$18,258.00	$4,495.62	$9,958.11	$32,711.73
Labor Contingency	164.84		Contractor Cost (0.15)		$4,906.76
			Contingency (0.25)		$9,404.62
Task 41070 Total	824.21				$47,023.11
Subject 41070 Total	824.21				$47,023.11
Category 41000 Total	824.21				$47,023.11
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.85
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	847.89				$49,474.96
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.64	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$36.58	$57.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.72	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.84	$22.05
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.45
			Contingency (0.30)		$2,080.24
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency	10.17		Contractor Cost (0.15)		$176.84
			Contingency (0.25)		$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	128.47	$3,557.35	$1,293.04	$855.28	$5,705.67
Ind. Labor & Material	42.40	$1,173.93	$0.00	$25.66	$1,199.59
State Sales Tax	0.00	$0.00	$78.49	$33.04	$81.53
QA/QC Impact	8.54	$236.56	$64.65	$44.05	$345.26
	179.41	$4,967.84	$1,406.18	$958.03	$7,332.05
Labor Contingency	53.82		Contractor Cost (0.15)		$1,099.81
			Contingency (0.30)		$2,229.57
Task 51050 Total	233.23				$10,961.43
Subject 51050 Total	233.23				$10,961.43
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$35.53	$313.12
State Sales Tax	0.00	$0.00	$101.90	$45.75	$147.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency	10.60		Contractor Cost (0.15)		$818.45
			Contingency (0.25)		$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.99	$0.00	$0.14	$9.13
State Sales Tax	0.00	$0.00	$12.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency	0.29		Contractor Cost (0.15)		$66.26
			Contingency (0.25)		$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency	1.03		Contractor Cost (0.15)		$162.30
			Contingency (0.25)		$349.40
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.09	$2,319.59	$0.00	$51.70	$2,371.29
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency	88.99		Contractor Cost (0.15)		$1,956.04
			Contingency (0.30)		$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency	127.54		Contractor Cost (0.15)		$2,248.00
			Contingency (0.25)		$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2736.60				$116,511.01
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.08	$22.42	$136.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency	18.15		Contractor Cost (0.15)		$964.92
			Contingency (0.25)		$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	6.82	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,908.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.39	$0.00	$271.67	$5,289.06
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3849.25				$197,293.64

TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT.	5251.31 x 10^3 man-hrs	$278,157.30

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	112.61	$3,686.69	$283.48	$1,655.36	$5,625.53
Ind. Labor & Material	37.16	$1,216.61	$0.00	$52.66	$1,269.27
State Sales Tax	0.00	$0.00	$10.63	$63.94	$74.57
QA/QC Impact	7.49	$245.17	$14.17	$85.25	$344.59
	157.26	$5,148.47	$308.28	$1,854.21	$7,310.96
Labor Contingency	47.18		Contractor Cost (0.15)		$1,096.65
			Contingency (0.30)		$2,522.28
Task 23011 Total	204.43				$10,929.89
Subject 23010 Total	204.43				$10,929.89
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.57		Contractor Cost (0.15)		$15.38
			Contingency (0.30)		$35.39
Task 23085 Total	2.48				$153.34
Subject 23080 Total	2.48				$153.34
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.48		Contractor Cost (0.15)		$15.38
			Contingency (0.25)		$29.49
Task 23105 Total	2.39				$147.44
Subject 23100 Total	2.39				$147.44
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.23	$40.34	$6.48	$26.01	$72.83
Ind. Labor & Material	0.41	$13.31	$0.00	$0.78	$14.09
State Sales Tax	0.00	$0.00	$0.24	$1.00	$1.24
QA/QC Impact	0.08	$2.68	$0.32	$1.34	$4.34
	1.72	$56.33	$7.04	$29.13	$92.50
Labor Contingency	0.43		Contractor Cost (0.15)		$13.87
			Contingency (0.25)		$26.60
Task 23115 Total	2.15				$132.97
Subject 23110 Total	2.15				$132.97
Category 23000 Total	211.45				$11,363.64
Area 20000 Total	211.45				$11,363.64
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	17.20	$476.40	$97.67	$390.67	$964.74
Ind. Labor & Material	5.68	$157.21	$0.00	$11.72	$168.93
State Sales Tax	0.00	$0.00	$3.66	$15.09	$18.75
QA/QC Impact	1.14	$31.68	$4.88	$20.12	$56.68
	24.03	$665.29	$106.21	$437.60	$1,209.10
Labor Contingency	7.21		Contractor Cost (0.15)		$181.36
			Contingency (0.30)		$417.14
Task 30010 Total	31.23				$1,807.60
Subject 30010 Total	31.23				$1,807.60
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	9.31	$257.87	$52.88	$211.53	$522.28
Ind. Labor & Material	3.07	$85.10	$0.00	$6.35	$91.45
State Sales Tax	0.00	$0.00	$1.98	$8.17	$10.15
QA/QC Impact	0.62	$17.15	$2.64	$10.89	$30.68
	13.01	$360.12	$57.50	$236.94	$654.56
Labor Contingency	3.90		Contractor Cost (0.15)		$98.18
			Contingency (0.30)		$225.82
Task 30080 Total	16.91				$978.56
Subject 30080 Total	16.91				$978.56
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.65	$128.79	$26.40	$105.60	$260.79
Ind. Labor & Material	1.53	$42.50	$0.00	$3.17	$45.67
State Sales Tax	0.00	$0.00	$0.99	$4.08	$5.07
QA/QC Impact	0.31	$8.56	$1.32	$5.44	$15.32
	6.50	$179.85	$28.71	$118.29	$326.85
Labor Contingency	1.62		Contractor Cost (0.15)		$49.03
			Contingency (0.25)		$93.97
Task 30106 Total	8.12				$469.85
Subject 30100 Total	8.12				$469.85

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.20	$116.17	$23.81	$95.25	$235.23
Ind. Labor & Material	1.38	$38.34	$0.00	$2.86	$41.20
State Sales Tax	0.00	$0.00	$0.89	$3.68	$4.57
QA/QC Impact	0.28	$7.73	$1.19	$4.91	$13.83
	5.86	$162.24	$25.89	$106.70	$294.83
Labor Contingency	1.46		Contractor Cost (0.15)		$44.22
			Contingency (0.25)		$84.78
Task 30116 Total	7.32				$423.83
Subject 30110 Total	7.32				$423.83
Category 30000 Total	63.58				$3,679.84
Area 30000 Total	63.58				$3,679.84
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	183.87	$5,091.16	$2,591.04	$723.22	$8,405.42
Ind. Labor & Material	60.68	$1,680.08	$0.00	$21.70	$1,701.78
State Sales Tax	0.00	$0.00	$97.16	$27.93	$125.09
QA/QC Impact	12.23	$338.56	$129.55	$37.25	$505.36
	256.77	$7,109.80	$2,817.75	$810.10	$10,737.65
Labor Contingency	64.19		Contractor Cost (0.15)		$1,610.64
			Contingency (0.25)		$3,087.07
Task 41070 Total	320.97				$15,435.36
Subject 41070 Total	320.97				$15,435.36
Category 41000 Total	320.97				$15,435.36
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$6.83	$222.88
State Sales Tax	0.00	$0.00	$24.75	$8.79	$33.54
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33		Contractor Cost (0.15)		$11.20
			Contingency (0.40)		$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	721.70	$20,177.56	$17,882.98	$10,832.96	$48,893.50
Ind. Labor & Material	238.16	$6,658.59	$0.00	$324.99	$6,983.58
State Sales Tax	0.00	$0.00	$670.61	$418.42	$1,089.03
QA/QC Impact	47.99	$1,341.81	$894.15	$557.90	$2,793.86
	1007.85	$28,177.96	$19,447.74	$12,134.27	$59,759.97
Labor Contingency	403.14		Contractor Cost (0.15)		$8,964.00
			Contingency (0.40)		$27,489.59
Task 43300 Total	1411.00				$96,213.56
Subject 43300 Total	1411.00				$96,213.56
Category 43000 Total	1613.07				$107,190.38
Area 40000 Total	1934.04				$122,625.74
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	204.39	$5,660.07	$821.36	$420.06	$6,901.49
Ind. Labor & Material	67.45	$1,867.82	$0.00	$12.60	$1,880.42
State Sales Tax	0.00	$0.00	$30.80	$16.22	$47.02
QA/QC Impact	13.59	$376.39	$41.07	$21.63	$439.09
	285.44	$7,904.28	$893.23	$470.51	$9,268.02
Labor Contingency	71.36		Contractor Cost (0.15)		$1,390.19
			Contingency (0.25)		$2,664.56
Task 51011 Total	356.79				$13,322.77
Subject 51010 Total	356.79				$13,322.77
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	330.34	$10,589.31	$899.65	$730.77	$12,219.73
Ind. Labor & Material	109.01	$3,494.47	$0.00	$21.85	$3,516.32
State Sales Tax	0.00	$0.00	$33.74	$28.23	$61.97
QA/QC Impact	21.97	$704.19	$44.99	$37.63	$786.81
	461.31	$14,787.97	$978.38	$818.55	$16,584.90
Labor Contingency	138.39		Contractor Cost (0.15)		$2,487.74
			Contingency (0.30)		$5,721.80
Task 51031 Total	599.71				$24,794.44
Subject 51030 Total	599.71				$24,794.44
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	103.53	$2,866.66	$172.42	$381.74	$3,420.82
Ind. Labor & Material	34.16	$946.00	$0.00	$11.45	$957.45
State Sales Tax	0.00	$0.00	$6.46	$14.74	$21.20
QA/QC Impact	6.88	$190.63	$8.62	$19.66	$218.91
	144.58	$4,003.29	$187.50	$427.59	$4,618.38
Labor Contingency	36.14		Contractor Cost (0.15)		$692.76
			Contingency (0.25)		$1,327.78
Task 51040 Total	180.72				$6,638.92
Subject 51040 Total	180.72				$6,638.92
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	168.68	$4,670.82	$4,698.29	$3,970.12	$13,339.23
Ind. Labor & Material	55.67	$1,541.37	$0.00	$118.10	$1,660.47
State Sales Tax	0.00	$0.00	$176.19	$152.35	$328.54
QA/QC Impact	11.22	$310.61	$234.92	$204.46	$749.99
	235.57	$6,522.80	$5,109.40	$4,447.03	$16,079.23
Labor Contingency	70.67		Contractor Cost (0.15)		$2,411.88
			Contingency (0.30)		$5,547.33
Task 51050 Total	306.24				$24,038.44
Subject 51050 Total	306.24				$24,038.44
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	11.91	$330.01	$1,065.97	$464.63	$1,860.61
Ind. Labor & Material	3.93	$108.90	$0.00	$13.87	$122.87
State Sales Tax	0.00	$0.00	$39.97	$17.63	$57.60
QA/QC Impact	0.79	$21.95	$53.30	$23.93	$99.18
	16.64	$460.86	$1,159.24	$520.45	$2,140.55
Labor Contingency	4.16		Contractor Cost (0.15)		$321.09
			Contingency (0.25)		$615.42
Task 51070 Total	20.80				$3,077.06
Subject 51070 Total	20.80				$3,077.06
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.65	$21.37	$210.00	$3.71	$235.08
Ind. Labor & Material	0.22	$7.05	$0.00	$0.11	$7.16
State Sales Tax	0.00	$0.00	$7.87	$0.14	$8.01
QA/QC Impact	0.04	$1.42	$10.50	$0.19	$12.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.91	$29.84	$228.37	$4.15	$262.36
Labor Contingency	0.23		Contractor Cost (0.15)		$39.35
			Contingency (0.25)		$75.42
Task 51080 Total	1.14				$377.13
Subject 51080 Total	1.14				$377.13
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.58	$19.79	$930.09	$115.54	$1,065.42
Ind. Labor & Material	0.19	$6.53	$0.00	$3.47	$10.00
State Sales Tax	0.00	$0.00	$34.88	$4.46	$39.34
QA/QC Impact	0.04	$1.32	$46.51	$5.95	$53.78
	0.81	$27.64	$1,011.48	$129.42	$1,168.54
Labor Contingency	0.20		Contractor Cost (0.15)		$175.28
			Contingency (0.25)		$335.96
Task 51090 Total	1.01				$1,679.78
Subject 51090 Total	1.01				$1,679.78
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	133.46	$4,384.31	$799.33	$815.40	$5,999.04
Ind. Labor & Material	44.04	$1,446.82	$0.00	$24.46	$1,471.28
State Sales Tax	0.00	$0.00	$29.97	$31.29	$61.46
QA/QC Impact	8.88	$291.56	$39.97	$41.99	$373.52
	186.38	$6,122.69	$869.27	$913.34	$7,905.30
Labor Contingency	55.91		Contractor Cost (0.15)		$1,185.80
			Contingency (0.30)		$2,727.33
Task 51100 Total	242.30				$11,818.43
Subject 51100 Total	242.30				$11,818.43
Category 51000 Total	1708.70				$85,746.97
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	42.00	$1,430.94	$5,781.23	$300.18	$7,512.35
Ind. Labor & Material	13.86	$472.21	$0.00	$9.01	$481.22
State Sales Tax	0.00	$0.00	$216.80	$11.59	$228.39
QA/QC Impact	2.79	$95.16	$289.06	$15.46	$399.68
	58.65	$1,998.31	$6,287.09	$336.24	$8,621.64
Labor Contingency	14.66		Contractor Cost (0.15)		$1,293.24
			Contingency (0.25)		$2,478.73
Task 52010 Total	73.32				$12,393.60
Subject 52010 Total	73.32				$12,393.60
52020 Communications					
52020 Communications					
Direct Cost	6.01	$204.69	$2.90	$18.62	$226.21
Ind. Labor & Material	1.98	$67.55	$0.00	$0.56	$68.11
State Sales Tax	0.00	$0.00	$0.11	$0.72	$0.83
QA/QC Impact	0.40	$13.61	$0.14	$0.96	$14.71
	8.39	$285.85	$3.15	$20.86	$309.86
Labor Contingency	2.52		Contractor Cost (0.15)		$46.48
			Contingency (0.30)		$106.91
Task 52020 Total	10.91				$463.25
Subject 52020 Total	10.91				$463.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	139.02	$3,849.25	$17,414.69	$6,996.59	$28,260.53
Ind. Labor & Material	45.88	$1,270.65	$0.00	$209.50	$1,480.15
State Sales Tax	0.00	$0.00	$653.05	$270.24	$923.29
QA/QC Impact	9.24	$255.98	$870.74	$360.32	$1,487.04
	194.14	$5,375.48	$18,938.48	$7,837.05	$32,151.01
Labor Contingency	58.24		Contractor Cost (0.15)		$4,822.65
			Contingency (0.30)		$11,065.09
Task 52040 Total	252.38				$48,065.75
Subject 52040 Total	252.38				$48,065.75
Category 52000 Total	336.60				$60,922.60
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	146.25	$4,744.26	$1,398.25	$3,160.30	$9,302.81
Ind. Labor & Material	48.52	$1,563.61	$0.00	$94.81	$1,660.42
State Sales Tax	0.00	$0.00	$52.44	$122.07	$174.51
QA/QC Impact	9.73	$315.49	$69.92	$162.76	$548.17
	204.24	$6,625.36	$1,520.61	$3,539.94	$11,685.91
Labor Contingency	71.48		Contractor Cost (0.15)		$1,752.89
			Contingency (0.35)		$4,703.58
Task 53000 Total	275.72				$18,142.38
Subject 53000 Total	275.72				$18,142.38
Category 53000 Total	275.72				$18,142.38
Area 50000 Total	2321.03				$164,811.95

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 4530.10 x 10^3 man-hrs $302,481.17 *

Case 5

Contents

Summary Cost Matrix (Table 1)

Surface Facility Capital Costs

Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

Underground Facilities, Project Phase 1 (Capital Costs - Engineering and Construction)

Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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05-Jan-89 REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 5 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$247.27	$27.26	$26.52	$53.78	$15.14	$6.87	$22.01	$323.06
	1000	SUPPORT CONTRACTOR	$37.82	$0.00	$0.00	$0.00	$3.03	$0.90	$3.92	$41.74
	1010	Surface	$22.47			$0.00		$0.90	$0.90	
	1020	Subsurface	$15.35			$0.00	$3.03		$3.03	
	2000	ARCHITECT-ENGINEER	$151.27	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$12.11	$3.58	$15.69	$166.96
	2010	Surface	$89.88	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$61.39	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$12.11		$12.11	
	3000	CONSTRUCTION MANAGEMENT	$57.19	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$59.58
	3010	Surface	$34.67	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$22.52			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.26	$0.52	$3.78			$0.00	$3.78
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$90.92	$16.02	$106.94	$1.51	$39.85	$41.36	$326.31
	11000	EMPLOYEE TRANSPORTATION		$83.03	$13.68	$96.71	$1.20		$1.20	$97.91
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$337.45	$1,646.65	$217.40	$1,864.04	$42.39	$21.93	$64.32	$2,265.82
4.3.2.1	21000	WASTE HANDLING FACILITY	$201.55	$655.32	$31.55	$686.87	XXXXXXXXXX	$14.77	$14.77	$903.19
	21100	Waste Handling Building 1:	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	$0.00	
4.3.2.1.2	21102	Building/Structures	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$0.00			$0.00	XXXXXXXXXX		$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 5 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$156.23	$0.00	$0.00	$0.00	XXXXXXXXXXX	$10.57	$10.57	
4.3.2.1.9	21202	Building/Structures	$70.77			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$20.55			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$10.96			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$7.72			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$41.83			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$4.40			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$45.32	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.20	$4.20	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.02			$0.00	XXXXXXXXXXX	$1.69	$1.69	
	21502	Vehicle Wash Facility	$0.79			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.43			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$88.48	$964.55	$170.38	$1,134.94	$32.37	$4.45	$36.82	$1,260.24
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.02		$19.02	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.49			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$10.53			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$10.03	$2.71	$12.74	$102.40
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$9.64	$0.67	$10.31	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04	$9.64		$9.64	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 5 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMIS-SIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.14	$2.04	$2.18	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.14		$0.14	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.13		$0.13	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.12	$0.00	$0.12	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.12		$0.12	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.30	XXXXXXXXXXXX	$3.30	$99.49
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.61	XXXXXXXXXXXX	$1.61	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.86	XXXXXXXXXXXX	$0.86	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXXX	$0.41	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXXX	$0.41	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXXX	$0.41	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXXX	$0.41	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$146.24	$897.10	$45.55	$942.65	$112.27	XXXXXXXXXXXX	$112.27	$1,201.16
4.3.4.1	41000	DEVELOPMENT	$126.05	$686.61	$43.10	$729.71	$14.15	XXXXXXXXXXXX	$14.15	$869.91
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$78.13	$453.69	XXXXXXXXXXX	$453.69	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXX	$14.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXX	$47.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXX	$22.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41024	Emplacement Drifts	$24.83	$192.22	XXXXXXXXXXX	$192.22	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$19.69	$177.04	XXXXXXXXXXX	$177.04	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$5.25	$40.33	XXXXXXXXXXX	$40.33	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$5.25	$40.33	XXXXXXXXXXX	$40.33	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41060	Excavated Material Handling	$12.90	$32.39	$0.00	$32.39	$0.00	XXXXXXXXXXX	$0.00	
	41070	General Maintenance	$8.94	$68.59	$43.10	$111.69	$14.15	XXXXXXXXXXX	$14.15	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.18	$210.50	$2.45	$212.95	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$233.13
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$119.36	$0.00	$119.36	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.35	$27.19	$0.00	$27.19	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	

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TABLE 1, MRS SYSTEMS STUDY - CASE 5 COST MATRIX
(MILLIONS OF MID 1989 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$98.12	XXXXXXXXXXXX	$98.12	$98.12
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$4.98	XXXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$3.04	XXXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.69	XXXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.59	XXXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.56	XXXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.12	XXXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$87.15	XXXXXXXXXXXX	$87.15	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$100.44	$693.63	$195.29	$888.91	$150.66	XXXXXXXXXXXX	$150.66	$1,140.02
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$77.73	$551.40	$114.51	$665.91	$78.23	XXXXXXXXXXXX	$78.23	$821.86
4.3.5.1.1	51010	Material Support, Receiving/Warehousing	$12.96	$43.69	$19.19	$62.89	$12.15	XXXXXXXXXXXX	$12.15	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$12.15	XXXXXXXXXXXX	$12.15	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$39.88	$366.96	$33.35	$400.30	$24.18	XXXXXXXXXXXX	$24.18	
	51031	Development Area	$38.88	$244.01	$24.35	$268.36	$24.18	XXXXXXXXXXXX	$24.18	
	51032	Emplacement Area	$1.00	$122.95	$8.99	$131.94	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$5.93	XXXXXXXXXXXX	$5.93	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.05	$24.35	$9.05	$33.39	$21.02	XXXXXXXXXXXX	$21.02	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$7.37	$37.97	$0.00	$37.97	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.7'	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$2.72	XXXXXXXXXXXX	$2.72	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.33	XXXXXXXXXXXX	$0.33	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.48	XXXXXXXXXXXX	$1.48	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$10.43	XXXXXXXXXXXX	$10.43	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$56.42	XXXXXXXXXXXX	$56.42	$119.70
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$10.98	XXXXXXXXXXXX	$10.98	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.41	XXXXXXXXXXXX	$0.41	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$45.04	XXXXXXXXXXXX	$45.04	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$16.01	XXXXXXXXXXXX	$16.01	$198.45
		TOTAL REPOSITORY	$1,074.99	$3,370.25	$516.70	$3,886.95	$325.27	$68.65	$393.92	$5,355.86
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXXX	$1,183.37	$8.74	$1,192.11	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$1,192.11
	61000	SPENT FUEL	XXXXXXXXXXXXXXX	$754.39	$0.00	$754.39	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$754.39
	61010	Intact PWR	XXXXXXXXXXXXXXX	$109.80		$109.80	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXXX	$58.31		$58.31	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXXX	$431.61		$431.61	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXXX	$154.66		$154.66	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXXX	$215.56		$215.56	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$215.56
	63000	OTHER WASTE	XXXXXXXXXXXXXXX	$213.43	$8.74	$222.16	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$222.16
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXXX	$146.94		$146.94	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXXX	$5.10		$5.10	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXXX	$55.00		$55.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	99999	TOTAL REPOSITORY,with EMPLACEMENT CONTAINERS	$1,074.99	$4,553.63	$525.44	$5,079.06	$325.27	$68.65	$393.92	$6,547.97

DATE: 14-Nov-89
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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 5
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.5	2,383.5	0.0	3,021.0	637.5	89.4 25%	937.0	4,684.9	320.1	5,005.0 10%	365.9	18.3	96.1	480.3	5,485.3
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9 25%	588.1	2,940.6	200.6	3,141.2 10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0 25%	79.4	396.8	27.2	424.0 10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.1	0.0	0.0	822.1	822.1	0.0 20%	328.8	1,973.0	138.1	2,111.1 5%	82.2	4.1	17.3	103.6	2,214.7
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0 20%	696.1	4,176.5	292.4	4,468.9 5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3 20%	36.5	218.8	15.2	234.0 5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0 20%	143.5	860.9	60.3	921.2 5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.9	448.4	0.0	697.3	248.9	16.8 20%	192.6	1,155.6	79.5	1,235.1 5%	47.3	2.4	9.9	59.6	1,294.7
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,327.9	9,219.8	2,076.1	267.9 30%	3,469.1	15,032.9	1,027.9	16,060.8 15%	1,694.4	84.7	533.7	2,312.8	18,373.6
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.4	0.0	41.9	16.5	1.0 20%	11.9	71.3	4.9	76.2 5%	2.9	0.1	0.6	3.6	79.8
		SUBTOTAL 120 - ON SITE	222.4	$6,383.6	$6,316.3	$5,501.5	$18,201.4	$6,383.6	$443.3	$6,483.0	$31,511.3	$2,166.2	$33,677.5	$2,672.0	$133.7	$771.9	$3,577.6	$37,255.1
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1 25%	2,294.6	11,473.0	784.7	12,257.7 10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8 30%	1,598.4	6,926.5	477.0	7,403.5 15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.5	68,508.6	0.0	82,398.1	13,889.5	2,569.1 25%	24,714.2	123,570.9	8,425.2	131,996.1 10%	9,628.8	481.4	2,527.6	12,637.8	144,633.9
	130.50	OFF SITE - UTILITIES	39.1	1,133.4	949.5	224.7	2,307.6	1,133.4	44.0 30%	1,045.5	4,530.5	313.1	4,843.6 15%	516.2	25.8	162.6	704.6	5,548.2
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0 25%	6,961.1	34,805.6	2,386.7	37,192.3 10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.7	$24,233.4	$92,517.9	$230.0	$116,981.3	$24,233.4	$3,478.0	$36,613.8	$181,306.5	$12,386.7	$193,693.2	$14,555.7	$727.7	$3,889.3	$19,172.7	$212,865.9
4.3.1	TOTAL 100 - SITE		1,058.1	$30,617.0	$98,834.2	$5,731.5	$135,182.7	$30,617.0	$3,921.3	$43,096.8	$212,817.8	$14,552.9	227,370.7	$17,227.7	$861.4	$4,661.2	$22,750.3	$250,121.0
	211.02	MHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.03	MHB I - HOT CELL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.04	MHB I - UTILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.05	MHB I - HVAC EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.06	MHB I - HANDL/PACK EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.07	MHB I - SUPPORT FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	594.8	17,248.8	14,376.8	1,097.0	32,722.6	17,248.8	580.3 40%	20,220.7	70,772.4	4,897.2	75,669.6 25%	12,492.9	624.6	5,247.0	18,364.5	94,034.1
	212.03	MHB II - HOT CELL EQUIP	72.3	2,097.7	0.0	10,104.1	12,201.8	2,097.7	378.9 40%	5,871.4	20,549.8	1,401.4	21,951.2 25%	3,574.9	178.7	1,501.4	5,255.0	27,206.2
	212.04	MHB II - UTILITIES	95.9	2,646.1	984.4	1,459.6	5,090.1	2,646.1	91.7 40%	3,131.2	10,959.1	758.2	11,717.3 25%	1,934.1	96.7	812.3	2,843.1	14,560.4
	212.05	MHB II - HVAC EQUIPMENT	43.8	1,269.0	1,373.3	1,493.6	4,135.9	1,269.0	107.5 40%	2,205.0	7,717.4	529.7	8,247.1 25%	1,351.2	67.6	567.5	1,986.3	10,233.4
	212.06	MHB II - HANDL/PACK EQUIP	149.2	4,326.0	0.0	20,456.8	24,782.8	4,326.0	767.1 40%	11,950.4	41,826.3	2,852.7	44,679.0 25%	7,277.2	363.9	3,056.4	10,697.5	55,376.5
	212.07	MHB II - SUPPORT FAC.	7.6	221.2	0.0	2,599.9	2,821.1	221.2	97.5 40%	1,255.9	4,395.7	298.1	4,693.8 25%	760.6	38.0	319.4	1,118.0	5,811.8
		SUBTOTAL 212 - MHB II	963.6	$27,808.8	$16,734.5	$37,211.0	$81,754.3	$27,808.8	$2,023.0	$44,634.6	$156,220.7	$10,737.3	$166,958.0	$27,390.9	$1,369.5	$11,504.0	$40,264.4	$207,222.4
	215.01	WASTE TREATMENT BUILDING	115.6	3,351.6	2,717.5	4,605.3	10,674.4	3,351.6	274.6 40%	5,720.2	20,020.8	1,374.5	21,395.3 25%	3,506.5	175.3	1,472.7	5,154.5	26,549.8
	215.02	VEHICLE WASH FACILITY	4.7	135.3	171.7	152.0	459.0	135.3	12.1 30%	181.9	788.3	54.1	842.4 15%	89.1	4.5	28.1	121.7	964.1
	215.03	DECONTAMINATION BUILDING	20.0	579.2	906.5	516.5	2,002.2	579.2	53.4 30%	790.4	3,425.2	234.9	3,660.1 15%	387.2	19.4	122.0	528.6	4,188.7
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.6	10,756.9	4,045.2	251.7 40%	6,021.5	21,075.3	1,450.6	22,525.9 25%	3,700.5	185.0	1,554.2	5,439.7	27,965.6
		SUBTOTAL 215 - OTHER	280.0	$8,111.3	$7,360.8	$8,420.4	$23,892.5	$8,111.3	$591.8	$12,714.0	$45,309.6	$3,114.1	$48,423.7	$7,683.3	$384.2	$3,177.0	$11,244.5	$59,668.2
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		1,243.6	$35,920.1	$24,095.3	$45,631.4	$105,646.8	$35,920.1	$2,614.8	$57,348.6	$201,530.3	$13,851.4	$215,381.7	$35,074.2	$1,753.7	$14,681.0	$51,508.9	$266,890.6

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 5
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.1	888.9	1,875.2	509.2	51.2	25%	608.9	3,044.5	208.6	3,253.1	10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2	25%	303.3	1,516.4	104.6	1,621.0	10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.8	568.0	803.2	1,986.0	614.8	51.4	30%	795.7	3,447.9	236.7	3,684.6	15%	390.1	19.5	122.9	532.5	4,217.1
	220.40	MAINTENANCE FACILITIES	49.4	1,433.2	1,828.3	415.4	3,676.9	1,433.2	84.1	25%	1,298.6	6,492.8	447.1	6,939.9	10%	511.0	25.6	134.2	670.8	7,610.7
	220.50	ADMIN/PERSONNEL FACILITIES	89.1	2,582.9	2,290.7	536.2	5,409.8	2,582.9	106.0	30%	2,429.6	10,528.3	727.3	11,255.6	15%	1,198.9	59.9	377.6	1,636.4	12,892.0
	220.60	MOCK-UP BUILDING	20.6	595.9	957.0	501.3	2,054.2	595.9	54.7	30%	811.4	3,516.2	241.2	3,757.4	15%	397.5	19.9	125.2	542.6	4,300.0
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.2	4,477.5	375.5	7,327.2	2,474.2	182.0	25%	2,495.9	12,479.3	857.6	13,336.9	10%	980.1	49.0	257.3	1,286.4	14,623.3
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1	25%	150.7	753.4	51.9	805.3	10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.6	222.1	3,348.0	4,009.7	439.6	133.9	30%	1,375.0	5,958.2	404.9	6,363.1	15%	667.4	33.4	210.2	911.0	7,274.1
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5	30%	451.6	1,957.0	135.1	2,092.1	15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.4	61.0	37.2	0.9	25%	24.8	123.9	8.6	132.5	10%	9.8	0.5	2.6	12.9	145.4
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6	25%	195.5	977.4	66.3	1,043.7	10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.7	2,925.2	4,046.8	1,078.9	111.3	25%	1,309.3	6,546.3	448.5	6,994.8	10%	512.6	25.6	134.6	672.8	7,667.6
	221.90	SEWAGE FACILITY	15.1	439.0	419.4	8.4	866.8	439.0	16.0	25%	330.5	1,652.3	114.3	1,766.6	10%	130.6	6.5	34.3	171.4	1,938.0
	222.20	MONOTORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1	30%	4,683.5	20,295.2	1,374.8	21,670.0	15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.7	0.0	5,186.5	5,210.2	23.7	194.5	25%	1,357.1	6,785.5	458.0	7,243.5	10%	523.4	26.2	137.4	687.0	7,930.5
	222.42	BATCH PLANT	10.2	296.2	0.5	1,273.0	1,569.7	296.2	47.8	25%	478.4	2,392.1	163.3	2,555.4	10%	186.6	9.3	49.0	244.9	2,800.3
4.3.2.2		TOTAL 220 - BALANCE OF PLANT	427.8	$12,406.0	$12,585.4	$30,359.2	$55,350.6	$12,406.0	$1,610.3		$19,099.8	$88,466.7	$6,048.8	$94,515.5		$8,489.8	$424.5	$2,498.7	$11,413.0	$105,928.5
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.8	159.1	35.6	348.5	153.8	7.3	30%	152.9	662.5	45.7	708.2	15%	75.3	3.8	23.7	102.8	811.0
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1,221.7	1,857.2	503.3	3,582.2	1,221.7	88.5	35%	1,712.3	6,604.7	454.0	7,058.7	20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.5	6,572.4	6,041.1	17,455.0	4,841.5	473.0	35%	7,969.3	30,738.8	2,107.0	32,845.8	20%	4,459.3	223.0	1,638.8	6,321.1	39,166.9
		TOTAL 230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8		$9,834.5	$38,006.0	$2,606.7	$40,612.7		$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0		GRAND TOTAL SURFACE FACILITIES	2,943.9	$85,160.1	$144,103.6	$88,302.1	$317,565.8	$85,160.1	$8,715.2		$129,379.7	$540,820.8	$37,059.8	$577,880.6		$66,287.1	$3,314.4	$23,856.5	$93,458.0	$671,338.6

DATE : 19-Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEMS STUDY - CASE 5
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	5	7	9	12	14	16	16	16	
BUSES AT $100.0 K per YEAR	COST	$200	$500	$700	$900	$1,200	$1,400	$1,600	$32,000	$1,600	$40,100
	SUBTOTAL - 100	$226	$526	$726	$1,160	$1,460	$1,660	$1,860	$37,200	$1,860	$46,678
CONTINGENCY @ 20%		$45	$105	$145	$232	$292	$332	$372	$7,440	$372	$9,336
	TOTAL - 100	$271	$631	$871	$1,392	$1,752	$1,992	$2,232	$44,640	$2,232	$56,014
210 - WASTE HANDLING FACILITIES											
LABOR:	# of PEOPLE	17	45	74	105	136	166	175	175	175	
COST PER YR/ PERSON $52,700	COST	$896	$2,372	$3,900	$5,534	$7,167	$8,748	$9,223	$184,450	$9,223	$231,511
OPERATING SUPPLIES @ 5.0% of LABOR		$45	$119	$195	$277	$358	$437	$461	$9,223	$461	$11,576
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$1,335	$1,335	$1,335	$8,010	$8,010	$8,010	$8,010	$160,200	$8,010	$204,255
Capital Cost = $ 267 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$1,380	$1,454	$1,530	$8,287	$8,368	$8,447	$8,471	$169,423	$8,471	$215,831
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	1	1	1	10	10	10	10	10	10	
@ $.05/Kwhr	COST	$50	$50	$50	$500	$500	$500	$500	$10,000	$500	$12,650
LOCAL TAXES @ 3.75% OF MAT'L & SUP		$52	$55	$57	$311	$314	$317	$318	$6,353	$318	$8,094
	SUBTOTAL - 210	$2,377	$3,930	$5,537	$14,631	$16,349	$18,012	$18,511	$370,226	$18,511	$468,085
CONTINGENCY @ 40%		$951	$1,572	$2,215	$5,852	$6,540	$7,205	$7,405	$148,090	$7,405	$187,234
	TOTAL - 210	$3,328	$5,501	$7,752	$20,483	$22,889	$25,217	$25,916	$518,316	$25,916	$655,319
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	43	115	187	256	346	416	452	452	452	
COST PER YR/ PERSON $52,700	COST	$2,266	$6,061	$9,855	$13,491	$18,234	$21,923	$23,820	$476,408	$23,820	$595,879
OPERATING SUPPLIES @ 5.0% of LABOR		$113	$303	$493	$675	$912	$1,096	$1,191	$23,820	$1,191	$29,794
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$770	$770	$770	$3,080	$3,080	$3,080	$3,080	$61,600	$3,080	$79,310
Capital Cost = 154 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$883	$1,073	$1,263	$3,755	$3,992	$4,176	$4,271	$85,420	$4,271	$109,104
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.6	2.6	2.6	26	26	26	26	26	26	
@ $.05/Kwhr	COST	$130	$130	$130	$1,300	$1,300	$1,300	$1,300	$26,000	$1,300	$32,890
LOCAL TAXES @ 3.75% OF MAT'L & SUP		$33	$40	$47	$141	$150	$157	$160	$3,203	$160	$4,091
	SUBTOTAL - 220	$3,313	$7,304	$11,295	$18,687	$23,676	$27,556	$29,552	$591,032	$29,552	$741,964
CONTINGENCY @ 30%		$994	$2,191	$3,388	$5,606	$7,103	$8,267	$8,865	$177,309	$8,865	$222,589
	TOTAL - 220	$4,306	$9,495	$14,683	$24,293	$30,778	$35,823	$38,417	$768,341	$38,417	$964,554
TOTAL ANNUAL O & M COST		$7,906	$15,628	$23,307	$46,168	$55,419	$63,032	$66,565	$1,331,297	$66,565	$1,675,887

DATE : 17 Nov-88

JOB 16029 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEMS STUDY - CASE 5
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	9	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$900	$4,600	$100	$5,600	$1,000	$46,700
	SUBTOTAL - 100	$978	$6,394	$178	$7,550	$1,260	$55,488
CONTINGENCY @ 20%		$196	$1,279	$36	$1,510	$252	$11,098
	TOTAL - 100	$1,174	$7,673	$214	$9,060	$1,512	$66,586
210 - WASTE HANDLING FACILITIES							
LABOR:	# of PEOPLE	103	12	6		0	
COST PER YR/ PERSON $52,700	COST	$5,428	$14,545	$316	$20,290	$0	$251,801
OPERATING SUPPLIES @ 5.0% of LABOR		$271	$727	$16	$1,014	$0	$12,590
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$27	$614	$27	$668	$0	$204,923
Capital Cost = $ 267 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$298	$1,341	$43	$1,682	$0	$217,513
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$13,150
LOCAL TAXES @ 3.75% OF MAT'L & SUP		$11	$50	$2	$63	$0	$8,157
	SUBTOTAL - 210	$5,757	$16,397	$380	$22,535	$0	$490,620
CONTINGENCY @ 40%		$2,303	$6,559	$152	$9,014	$0	$196,248
	TOTAL - 210	$8,060	$22,956	$532	$31,548	$0	$686,868
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	252	64	32		19	
COST PER YR/ PERSON $52,700	COST	$13,280	$77,574	$1,686	$92,541	$10,013	$698,433
OPERATING SUPPLIES @ 5.0% of LABOR		$664	$3,879	$84	$4,627	$501	$34,922
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$770	$17,710	$770	$19,250	$1,540	$100,100
Capital Cost = 154 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,434	$21,589	$854	$23,877	$2,041	$135,022
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$49,140
LOCAL TAXES @ 3.75% OF MAT'L & SUP		$54	$810	$32	$895	$77	$5,063
	SUBTOTAL - 220	$15,318	$112,623	$3,123	$131,064	$14,630	$887,658
CONTINGENCY @ 30%		$4,595	$33,787	$937	$39,319	$4,389	$266,297
	TOTAL - 220	$19,914	$146,410	$4,060	$170,383	$19,019	$1,153,955
TOTAL ANNUAL O & M COST		$29,148	$177,038	$4,806	$210,991	$20,531	$1,907,409

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 5
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10% 82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE												
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10% 1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10% 245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE												
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.4	75%	100.4	505.8	35%	177.0	10% 68.3	0.0	(0.1)	751.0
	120.70	ON SITE - DRAINAGE CONTROL		0.0												
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10% 9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10% 48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10% 1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9	$457.9	$0.0	$0.9	$5,037.0
	130.11	OFF SITE - ROADS (NEW)														
	130.13	OFF SITE - BRIDGES														
	130.21	OFF SITE - RAIL (NEW)														
	130.50	OFF SITE - UTILITIES														
	140.00	MONUMENTS														
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
4.3.1	TOTAL 100 - SITE		60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9	$457.9	$0.0	$0.9	$5,037.0
	211.02	MHB I - BUILDING/STRUCTURES														
	211.03	MHB I - HOT CELL EQUIPMENT														
	211.04	MHB I - UTILITIES														
	211.05	MHB I - HVAC EQUIPMENT														
	211.06	MHB I - HANDL/PACK EQUIP														
	211.07	MHB I - SUPPORT FACILITIES														
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	120.6	3,179.5	19.8	885.1	4,084.4	75%	2,384.6	6,469.0	35%	2,264.1	10% 873.3	960.6		10,567.0
	212.03	MHB II - HOT CELL EQUIP		INCLUDED ABOVE												
	212.04	MHB II - UTILITIES		INCLUDED ABOVE												
	212.05	MHB II - HVAC EQUIPMENT		INCLUDED ABOVE												
	212.06	MHB II - HANDL/PACK EQUIP		INCLUDED ABOVE												
	212.07	MHB II - SUPPORT FAC.		INCLUDED ABOVE												
		SUBTOTAL 212 - MHB II	120.6	$3,179.5	$19.8	$885.1	$4,084.4		$2,384.6	$6,469.0		$2,264.1	$873.3	$960.6	$0.0	$10,567.0
	215.01	WASTE TREATMENT BUILDING	18.2	479.8	10.0	187.1	676.9	75%	359.9	1,036.8	35%	362.9	10% 140.0	154.0	0.3	1,694.0
	215.02	VEHICLE WASH FACILITY	0.9	23.7	0.0	0.0	23.7	75%	17.8	41.5	35%	14.5	10% 5.6	6.2	0.2	68.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10% 21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10% 179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	44.1	$1,162.6	$20.7	$512.1	$1,695.4		$872.0	$2,567.4		$898.6	$346.7	$381.3	$0.1	$4,194.1
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		164.7	$4,342.1	$40.5	$1,397.2	$5,779.8		$3,256.6	$9,036.4		$3,162.7	$1,220.0	$1,341.9	$0.1	$14,761.1

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 5
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST		INDIRECT COST @ %	SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10%	15.6	17.1	0.6	189.0
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10%	12.5	13.7	0.3	151.0
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10%	19.9	21.9	(0.2)	241.0
	220.40	MAINTENANCE FACILITIES	8.1	213.5	0.0	0.0	213.5	75%	160.2	373.7	35%	130.8	10%	50.5	55.5	(0.5)	610.0
	220.50	ADMIN/PERSONNEL FACILITIES	12.6	332.2	0.0	0.0	332.2	75%	249.1	581.3	35%	203.4	10%	78.5	86.3	0.5	950.0
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10%	25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10%	49.8	54.8	0.1	603.0
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10%	6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10%	13.1	14.4	(0.3)	158.0
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10%	17.4	19.2		211.0
	221.10	EXPLOSIVE MAGAZINES	0.2	5.3	0.0	0.0	5.3	75%	4.0	9.3	35%	3.2	10%	1.2	1.4	(0.1)	15.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10%	2.1	2.3	0.3	26.0
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10%	23.7	26.0	(0.3)	286.0
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10%	12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10%	28.7	31.5	0.2	347.0
	222.30	STANDARD EQUIPMENT		0.0													
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10%	10.2	11.3		124.0
4.3.2.2	TOTAL 220 - BALANCE OF PLANT		58.7	$1,547.5	$0.0	$0.0	$1,547.5		$1,176.7	$2,724.2		$953.4		$367.7	$404.5	$1.0	$4,450.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10%	7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10%	48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10%	168.2	185.0	0.3	2,035.2
	TOTAL 230 - SURFACE SHAFT FAC.		35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8		$223.7	$246.0	$0.2	$2,706.1
4.0	GRAND TOTAL SURFACE FACILITIES		320.2	$8,443.8	$312.0	$1,397.2	$10,153.0		$6,655.3	$16,808.3		$5,882.8		$2,269.3	$1,992.4	$2.2	$26,955.0

03-Nov-88

MRS SYSTEM STUDY - CASE 5
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
C:\LOTUS\CONT_C5 REVISION "C"

WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTEN-TION ($1000s)	CONTIN-GENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	300	$17,000	$5,100	INCLUDED	$5,100
DHLW	DHLW	12,680	$17,000	$215,560	INCLUDED	$215,560
INTACT PWR	3A	1,099	$31,000	$34,069	INCLUDED	$34,069
INTACT PWR - WESTERN UTILITIES	3A	2,443	$31,000	$75,733	INCLUDED	$75,733
CONSOLIDATED PWR	3A	13,923	$31,000	$431,613	INCLUDED	$431,613
INTACT BWR	3B	584	$31,000	$18,104	INCLUDED	$18,104
INTACT BWR - WESTERN UTILITIES	3B	1,297	$31,000	$40,207	INCLUDED	$40,207
CONSOLIDATED BWR	3A	4,989	$31,000	$154,659	INCLUDED	$154,659
PWR HARDWARE	3C	2,393	$28,000	$67,004	INCLUDED	$67,004
BWR HARDWARE	3C	2,855	$28,000	$79,940	INCLUDED	$79,940
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		42,791		$1,128,373	$0	$1,128,373
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		43,103		$1,137,109	$0	$1,137,109
CONTACT HANDLED WASTE						$55,000
						$1,192,109

MRS STUDY CASE 5
MANAGEMENT AND INTEGRATION COST ESTIMATE
task:2605A138
FILE = ENG-5M.WK1 (RANGE=MGTINT)
06-Oct-88 02:42 PM

All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$37,586			
		EMPLACEMENT		$20,660			
		CARETAKER		$3,140			
		CLOSURE					$12,112
				$61,387	$0	$0	$12,112
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$15,347	$0	$0	$3,028
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $321,674 =====>		$22,517			
		of which	85%	$19,140 is labor			
		and	15%	$3,378 is materials and equipment.			
		Labor converts to at $100k per FTE.		191.40 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			27,925,800	5,140,000	
		CONSULTANT COST			$1,536	$283	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)	DURATION			24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)	PERSONS			582	107	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.	40 PER BUS			$34,907	$6,960	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.22	$548.88	$0.00	$25.15	$575.80
State Sales Tax	0.00	$0.00	$37.87	$32.12	$70.00
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$17.22	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.16	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.33	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.52	$461.16
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.92	$337.99
State Sales Tax	0.00	$0.00	$73.81	$42.38	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.12
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$43.33	$2,772.89
State Sales Tax	0.00	$0.00	$71.22	$55.79	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.14
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$8.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$2.52	$3.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.36	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.99	$243.68
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.64	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.57	$184.69	$0.00	$13.85	$198.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.89
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	183.39	$5,078.27	$5,541.79	$3,708.73	$14,328.79
Ind. Labor & Material	60.32	$1,675.83	$0.00	$111.26	$1,787.09
State Sales Tax	0.00	$0.00	$207.82	$143.25	$351.07
QA/QC Impact	12.20	$337.71	$277.09	$191.00	$805.80
	256.11	$7,091.81	$6,026.70	$4,154.24	$17,272.75
Labor Contingency	64.03		Contractor Cost (0.15)		$2,590.91
			Contingency (0.25)		$4,965.92
Task 41024 Total	320.14				$24,829.58
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	75.74	$2,097.22	$6,863.02	$2,043.02	$11,003.26
Ind. Labor & Material	24.99	$692.08	$0.00	$61.26	$753.34
State Sales Tax	0.00	$0.00	$257.37	$78.61	$335.98
QA/QC Impact	5.04	$139.47	$343.15	$105.22	$587.84
	105.77	$2,928.77	$7,463.54	$2,288.44	$12,680.75
Labor Contingency	37.02		Contractor Cost (0.15)		$1,902.12
			Contingency (0.35)		$5,104.00
Task 41025 Total	142.79				$19,686.87
Subject 41020 Total	751.83				$78,134.22
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	16.31	$451.49	$2,075.94	$439.82	$2,967.25
Ind. Labor & Material	5.38	$148.99	$0.00	$13.19	$162.18
State Sales Tax	0.00	$0.00	$77.85	$16.99	$94.84
QA/QC Impact	1.08	$30.02	$103.80	$22.65	$156.47
	22.77	$630.50	$2,257.59	$492.65	$3,380.74
Labor Contingency	7.97		Contractor Cost (0.15)		$507.12
			Contingency (0.35)		$1,360.75
Task 41045 Total	30.74				$5,248.61
Subject 41040 Total	30.74				$5,248.61
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	62.05	$1,874.14	$3,340.58	$2,123.50	$7,338.22
Ind. Labor & Material	20.48	$618.47	$0.00	$63.71	$682.18
State Sales Tax	0.00	$0.00	$125.27	$82.02	$207.29
QA/QC Impact	4.13	$124.63	$167.04	$109.36	$401.03
	86.65	$2,617.24	$3,632.89	$2,378.59	$8,628.72
Labor Contingency	25.99		Contractor Cost (0.15)		$1,294.30
			Contingency (0.30)		$2,976.90
Task 41060 Total	112.64				$12,899.92
Subject 41060 Total	112.64				$12,899.92
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	62.34	$1,726.03	$3,386.14	$114.08	$5,226.25
Ind. Labor & Material	20.57	$569.59	$0.00	$3.42	$573.01
State Sales Tax	0.00	$0.00	$126.98	$4.41	$131.39
QA/QC Impact	4.15	$114.78	$169.31	$5.88	$289.97
	87.05	$2,410.40	$3,682.43	$127.79	$6,220.62
Labor Contingency	21.76		Contractor Cost (0.15)		$933.10
			Contingency (0.25)		$1,788.43
Task 41070 Total	108.82				$8,942.15
Subject 41070 Total	108.82				$8,942.15
Category 41000 Total	1187.05				$126,052.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.98	$0.00	$3.29	$15.27
State Sales Tax	0.00	$0.00	$227.07	$5.14	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$1,982.89	$0.00	$1,982.89
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$74.36	$0.00	$74.36
QA/QC Impact	0.00	$0.00	$99.14	$0.00	$99.14
	0.00	$0.00	$2,156.39	$0.00	$2,156.39
Labor Contingency	0.00		Contractor Cost (0.15)		$323.45
			Contingency (0.35)		$867.94
Task 42030 Total	0.00				$3,347.78
Subject 42030 Total	0.00				$3,347.78
Category 42000 Total	2.09				$20,183.05
Area 40000 Total	1189.13				$146,235.16
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.75	$1,074.95
State Sales Tax	0.00	$0.00	$37.14	$9.97	$47.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$83.84	$83.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	500.98	$16,049.75	$2,167.46	$1,105.35	$19,322.56
Ind. Labor & Material	165.32	$5,296.42	$0.00	$33.16	$5,329.58
State Sales Tax	0.00	$0.00	$81.28	$42.69	$123.97
QA/QC Impact	33.32	$1,067.31	$108.38	$56.93	$1,232.62
	699.62	$22,413.48	$2,357.12	$1,238.13	$26,008.73
Labor Contingency	209.89		Contractor Cost (0.15)		$3,901.31
			Contingency (0.30)		$8,973.01
Task 51031 Total	909.51				$38,883.05
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.29
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	918.34				$39,882.56
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.78	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.67	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	11.32	$313.58	$20.43	$214.07	$548.08
Ind. Labor & Material	3.74	$103.48	$0.00	$6.42	$109.90
State Sales Tax	0.00	$0.00	$0.77	$8.27	$9.04
QA/QC Impact	0.75	$20.85	$1.02	$11.02	$32.89
	15.81	$437.91	$22.22	$239.78	$699.91
Labor Contingency	4.74		Contractor Cost (0.15)		$104.99
			Contingency (0.30)		$241.48
Task 51050 Total	20.56				$1,046.38
Subject 51050 Total	20.56				$1,046.38
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	66.94	$1,853.48	$1,578.89	$556.97	$3,989.34
Ind. Labor & Material	22.09	$611.65	$0.00	$16.71	$628.36
State Sales Tax	0.00	$0.00	$59.22	$21.51	$80.73
QA/QC Impact	4.45	$123.26	$78.94	$28.68	$230.88
	93.48	$2,588.39	$1,717.05	$623.87	$4,929.31
Labor Contingency	28.04		Contractor Cost (0.15)		$739.39
			Contingency (0.30)		$1,700.60
Task 51060 Total	121.52				$7,369.30
Subject 51060 Total	121.52				$7,369.30
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.91	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.49
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$51.97
			Contingency (0.25)		$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.26
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.68	$276.79
State Sales Tax	0.00	$0.00	$0.50	$2.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.65
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1479.14				$77,732.01
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT (All costs in thousands of dollars)	MATERIALS	TOTAL
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$406.62	$0.00	$20.10	$430.04
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.94	$31.93	$0.00	$0.59	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.52
			Contingency (0.30)		$56.39
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.99
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1691.87				$100,442.68

TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT.	3576.40 x 10^3 man-hrs	$321,674.10

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$116.85	$2,979.45
State Sales Tax	0.00	$0.00	$25.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.34
			Contingency (0.30)		$5,934.78
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$36.77	$529.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$18.60	$23.26
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.21	$214.22
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.20	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$127.56	$184.89
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68		Contractor Cost (0.15)		$1,506.33
			Contingency (0.25)		$2,887.17
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.15	$3,922.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86		Contractor Cost (0.15)		$2,910.56
			Contingency (0.25)		$5,411.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87		Contractor Cost (0.15)		$2,363.30
			Contingency (0.25)		$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	1963.38	$54,366.90	$12,250.19	$39,704.89	$106,321.98
Ind. Labor & Material	647.92	$17,941.08	$0.00	$1,191.15	$19,132.63
State Sales Tax	0.00	$0.00	$459.39	$1,533.60	$1,992.99
QA/QC Impact	130.56	$3,615.40	$612.51	$2,044.80	$6,272.71
	2741.86	$75,923.38	$13,322.09	$44,474.44	$133,719.91
Labor Contingency	685.47		Contractor Cost (0.15)		$20,057.99
			Contingency (0.25)		$38,444.47
Task 41024 Total	3427.33				$192,222.37
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1205.03	$33,366.13	$28,534.87	$32,503.79	$94,404.79
Ind. Labor & Material	397.66	$11,010.82	$0.00	$275.11	$11,285.93
State Sales Tax	0.00	$0.00	$1,070.06	$1,255.48	$2,325.55
QA/QC Impact	80.13	$2,218.85	$1,426.74	$1,673.95	$5,319.54
	1682.82	$46,595.80	$31,031.67	$36,408.31	$114,035.78
Labor Contingency	588.99		Contractor Cost (0.15)		$17,105.37
			Contingency (0.35)		$45,899.40
Task 41025 Total	2271.81				$177,040.55
Subject 41020 Total	6906.20				$453,694.04
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33		Contractor Cost (0.15)		$8,851.18
			Contingency (0.35)		$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	274.17	$7,591.55	$6,482.26	$7,431.47	$21,505.28
Ind. Labor & Material	90.48	$2,505.21	$0.00	$222.94	$2,728.15
State Sales Tax	0.00	$0.00	$243.08	$287.04	$530.12
QA/QC Impact	18.23	$504.84	$324.11	$382.72	$1,211.67
	382.88	$10,601.60	$7,049.45	$8,324.17	$25,975.22
Labor Contingency	134.01		Contractor Cost (0.15)		$3,666.28
			Contingency (0.35)		$10,455.02
Task 41045 Total	516.89				$40,326.52
Subject 41040 Total	516.89				$40,326.52
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	172.43	$5,191.49	$10,061.81	$3,099.58	$18,352.88
Ind. Labor & Material	56.90	$1,713.19	$0.00	$92.99	$1,806.18

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$377.32	$119.72	$497.04
QA/QC Impact	11.47	$345.23	$503.09	$159.63	$1,007.95
	240.80	$7,249.91	$10,942.22	$3,471.92	$21,664.05
Labor Contingency	72.24		Contractor Cost (0.15)		$3,249.61
			Contingency (0.30)		$7,474.09
Task 41060 Total	313.04				$32,387.75
Subject 41060 Total	313.04				$32,387.75
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	749.01	$20,740.59	$7,059.42	$9,884.68	$37,684.69
Ind. Labor & Material	247.17	$6,844.39	$0.00	$296.54	$7,140.93
State Sales Tax	0.00	$0.00	$264.73	$381.80	$646.53
QA/QC Impact	49.81	$1,379.25	$352.97	$509.06	$2,241.28
	1045.99	$28,964.23	$7,677.12	$11,072.08	$47,713.43
Labor Contingency	261.50		Contractor Cost (0.15)		$7,157.01
			Contingency (0.25)		$13,717.62
Task 41070 Total	1307.49				$68,588.06
Subject 41070 Total	1307.49				$68,588.06
Category 41000 Total	10194.33				$686,606.01
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	269.85	$8,835.01	$31,806.22	$26,740.20	$67,381.43
Ind. Labor & Material	89.05	$2,915.55	$0.00	$802.21	$3,717.76
State Sales Tax	0.00	$0.00	$1,192.74	$1,032.84	$2,225.58
QA/QC Impact	17.95	$587.53	$1,590.31	$1,377.12	$3,554.96
	376.85	$12,338.09	$34,589.27	$29,952.37	$76,879.73
Labor Contingency	131.90		Contractor Cost (0.15)		$11,531.95
			Contingency (0.35)		$30,944.09
Task 42010 Total	508.75				$119,355.77
Subject 42010 Total	508.75				$119,355.77
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	61.48	$2,013.01	$7,246.86	$6,092.59	$15,352.46
Ind. Labor & Material	20.27	$664.29	$0.00	$182.78	$847.07
State Sales Tax	0.00	$0.00	$271.76	$235.33	$507.09
QA/QC Impact	4.09	$133.87	$362.35	$313.77	$809.99
	85.86	$2,811.17	$7,880.97	$6,824.47	$17,516.61
Labor Contingency	30.05		Contractor Cost (0.15)		$2,627.49
			Contingency (0.35)		$7,050.44
Task 42030 Total	115.91				$27,194.54
Subject 42030 Total	115.91				$27,194.54
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.92	$95.60	$0.00	$0.00	$95.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	906.89				$210,495.23
Area 40000 Total	11101.21				$897,101.24
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	222.37	$6,157.78	$0.00	$341.33	$6,499.11
State Sales Tax	0.00	$0.00	$98.35	$53.61	$149.96
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,556.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3359.00	$107,800.38	$4,601.34	$6,846.38	$119,248.10
Ind. Labor & Material	1108.47	$35,574.13	$0.00	$205.39	$35,779.52
State Sales Tax	0.00	$0.00	$176.55	$260.44	$436.99
QA/QC Impact	223.37	$7,168.73	$230.06	$352.59	$7,751.38

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	4690.84	$150,543.24	$5,003.95	$7,668.80	$163,215.99
Labor Contingency	1407.25			Contractor Cost (0.15)	$24,482.41
				Contingency (0.30)	$56,309.53
Task 51031 Total	6098.09				$244,007.93
51032 Emplacement Area					
Direct Cost	1711.30	$54,985.36	$1,366.81	$3,542.51	$59,894.68
Ind. Labor & Material	564.73	$18,145.17	$0.00	$106.28	$18,251.45
State Sales Tax	0.00	$0.00	$51.26	$136.83	$188.09
QA/QC Impact	113.80	$3,656.53	$68.34	$182.44	$3,907.31
	2389.83	$76,787.06	$1,486.41	$3,968.06	$82,241.53
Labor Contingency	716.95			Contractor Cost (0.15)	$12,336.23
				Contingency (0.30)	$28,373.32
Task 51032 Total	3106.78				$122,951.08
Subject 51030 Total	9204.87				$366,959.01
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.29	$32.85	$47.14
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
Labor Contingency	86.84			Contractor Cost (0.15)	$1,647.73
				Contingency (0.25)	$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	294.00	$8,141.06	$1,427.19	$3,002.73	$12,570.98
Ind. Labor & Material	97.02	$2,686.55	$0.00	$90.08	$2,776.63
State Sales Tax	0.00	$0.00	$53.52	$115.98	$169.50
QA/QC Impact	19.55	$541.38	$71.36	$154.64	$767.38
	410.58	$11,368.99	$1,552.07	$3,363.43	$16,284.49
Labor Contingency	123.17			Contractor Cost (0.15)	$2,442.68
				Contingency (0.30)	$5,618.16
Task 51050 Total	533.75				$24,345.33
Subject 51050 Total	533.75				$24,345.33
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	382.00	$10,577.58	$6,767.73	$2,917.09	$20,262.40
Ind. Labor & Material	126.06	$3,490.60	$0.00	$87.51	$3,578.11
State Sales Tax	0.00	$0.00	$253.79	$112.67	$366.46
QA/QC Impact	25.40	$703.41	$338.38	$150.23	$1,192.02
	533.46	$14,771.59	$7,359.90	$3,267.50	$25,398.99
Labor Contingency	160.04			Contractor Cost (0.15)	$3,809.85
				Contingency (0.30)	$8,762.66
Task 51060 Total	693.50				$37,971.50
Subject 51060 Total	693.50				$37,971.50
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$94.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
Labor Contingency	9.79			Contractor Cost (0.15)	$755.49
				Contingency (0.25)	$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
Labor Contingency	0.54			Contractor Cost (0.15)	$92.60
				Contingency (0.25)	$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
Labor Contingency	0.95			Contractor Cost (0.15)	$426.70
				Contingency (0.25)	$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47		Contractor Cost (0.15)		$3,063.79
			Contingency (0.30)		$7,046.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax	0.00	$0.00	$0.18	$26.84	$27.02
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73		Contractor Cost (0.15)		$2,075.07
			Contingency (0.25)		$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	13304.98				$551,399.31
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64		Contractor Cost (0.15)		$2,153.85
			Contingency (0.25)		$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.64	$2.62	$3.26
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46		Contractor Cost (0.15)		$159.64
			Contingency (0.30)		$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72		Contractor Cost (0.15)		$538.81
			Contingency (0.30)		$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.42	$0.00	$11.12	$141.56
State Sales Tax	0.00	$0.00	$1.97	$13.34	$15.31
QA/QC Impact	0.95	$26.28	$1.47	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98		Contractor Cost (0.15)		$151.61
			Contingency (0.30)		$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.57	$10,365.32	$0.00	$543.04	$10,908.36
State Sales Tax	0.00	$0.00	$300.65	$699.16	$999.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37		Contractor Cost (0.15)		$10,928.80
			Contingency (0.35)		$29,325.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	15442.50				$693,625.65

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT: 27295.77 x 10^3 man-hrs $1,632,197.27

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$64.02	$1,614.60
State Sales Tax	0.00	$0.00	$21.68	$82.42	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$37.83	$572.15
State Sales Tax	0.00	$0.00	$12.45	$51.29	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.25
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$248.65
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	432.77	$11,983.35	$3,789.02	$8,148.48	$23,920.85
Ind. Labor & Material	142.81	$3,954.51	$0.00	$244.45	$4,198.96
State Sales Tax	0.00	$0.00	$142.08	$314.73	$456.81
QA/QC Impact	28.78	$796.89	$189.45	$419.65	$1,405.99
	604.36	$16,734.75	$4,120.55	$9,127.31	$29,982.61
Labor Contingency	151.09		Contractor Cost (0.15)		$4,497.39
			Contingency (0.25)		$8,619.99
Task 41070 Total	755.45				$43,099.99
Subject 41070 Total	755.45				$43,099.99
Category 41000 Total	755.45				$43,099.99
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.43
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	779.12				$45,551.84
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	331.30	$10,486.63	$549.24	$934.90	$11,970.77
Ind. Labor & Material	109.33	$3,460.59	$0.00	$28.05	$3,488.64
State Sales Tax	0.00	$0.00	$20.60	$29.11	$49.71
QA/QC Impact	22.03	$697.36	$27.46	$48.15	$772.97
	462.66	$14,644.58	$597.30	$1,047.21	$16,289.09
Labor Contingency	138.80		Contractor Cost (0.15)		$2,443.38
			Contingency (0.30)		$5,619.75
Task 51031 Total	601.45				$24,352.22
51032 Emplacement Area					
Direct Cost	120.19	$3,853.34	$271.40	$302.86	$4,427.60
Ind. Labor & Material	39.66	$1,271.60	$0.00	$9.09	$1,280.69
State Sales Tax	0.00	$0.00	$10.18	$11.70	$21.88
QA/QC Impact	7.99	$256.25	$13.57	$15.60	$285.42
	167.85	$5,381.19	$295.15	$339.25	$6,015.59
Labor Contingency	50.35		Contractor Cost (0.15)		$902.33
			Contingency (0.30)		$2,075.38
Task 51032 Total	218.20				$8,993.30
Subject 51030 Total	819.65				$33,345.52
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency	10.17			Contractor Cost (0.15)	$176.84
				Contingency (0.25)	$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	106.04	$2,936.23	$1,067.28	$705.95	$4,709.46
Ind. Labor & Material	34.99	$968.96	$0.00	$21.18	$690.12
State Sales Tax	0.00	$0.00	$40.02	$67.27	$221.14
QA/QC Impact	7.05	$195.26	$53.36	$36.36	$87.66
	148.08	$4,100.45	$1,160.66	$790.76	$284.98
Labor Contingency	44.43			Contractor Cost (0.15)	$6,051.87
				Contingency (0.30)	$907.78
Task 51050 Total	192.51				$2,087.89
Subject 51050 Total	192.51				$9,047.54
					$9,047.54
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$25.53	$379.12
State Sales Tax	0.00	$0.00	$101.90	$45.75	$147.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency	10.60			Contractor Cost (0.15)	$818.45
				Contingency (0.25)	$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.99	$0.00	$0.14	$9.13
State Sales Tax	0.00	$0.00	$12.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency	0.29			Contractor Cost (0.15)	$62.26
				Contingency (0.25)	$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency	1.03			Contractor Cost (0.15)	$182.30
				Contingency (0.25)	$349.40
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.08	$2,319.59	$0.00	$51.70	$2,371.29
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency	88.99			Contractor Cost (0.15)	$1,956.04
				Contingency (0.30)	$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$28.08	$28.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency	127.54			Contractor Cost (0.15)	$2,248.00
				Contingency (0.25)	$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2694.05				$114,506.01
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.06	$22.44	$136.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency	18.15			Contractor Cost (0.15)	$964.92
				Contingency (0.25)	$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	9.82	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,908.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.36	$0.00	$241.67	$5,259.06
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3806.70				$195,288.64

* TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT. 5140.00 x 10^3 man-hrs $272,229.18 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	99.36	$3,252.96	$250.13	$1,460.61	$4,963.70
Ind. Labor & Material	32.79	$1,073.48	$0.00	$43.82	$1,117.30
State Sales Tax	0.00	$0.00	$92.38	$90.42	$182.80
QA/QC Impact	6.61	$216.32	$12.51	$75.22	$304.05
	138.76	$4,542.76	$272.02	$1,636.07	$6,450.85
Contractor Cost (0.15)					$967.64
Labor Contingency	41.63			Contingency (0.30)	$2,225.55
Task 23011 Total	180.38				$9,644.04
Subject 23010 Total	180.38				$9,644.04
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Contractor Cost (0.15)					$13.58
Labor Contingency	0.51			Contingency (0.30)	$31.23
Task 23085 Total	2.19				$135.31
Subject 23080 Total	2.19				$135.31
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Contractor Cost (0.15)					$13.58
Labor Contingency	0.42			Contingency (0.25)	$26.02
Task 23105 Total	2.11				$130.10
Subject 23100 Total	2.11				$130.10
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.07	$35.08	$5.63	$22.62	$63.33
Ind. Labor & Material	0.35	$11.58	$0.00	$0.68	$12.26
State Sales Tax	0.00	$0.00	$0.21	$0.87	$1.08
QA/QC Impact	0.07	$2.33	$0.28	$1.17	$3.78
	1.50	$48.99	$6.12	$25.34	$80.45
Contractor Cost (0.15)					$12.07
Labor Contingency	0.37			Contingency (0.25)	$23.13
Task 23115 Total	1.87				$115.65
Subject 23110 Total	1.87				$115.65
Category 23000 Total	186.55				$10,025.10
Area 20000 Total	186.55				$10,025.10
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	15.29	$423.47	$86.81	$347.27	$857.55
Ind. Labor & Material	5.05	$139.75	$0.00	$10.42	$150.17
State Sales Tax	0.00	$0.00	$3.26	$13.41	$16.67
QA/QC Impact	1.02	$28.16	$4.34	$17.88	$50.38
	21.36	$591.38	$94.41	$388.98	$1,074.77
Contractor Cost (0.15)					$161.22
Labor Contingency	6.41			Contingency (0.30)	$370.79
Task 30010 Total	27.76				$1,606.78
Subject 30010 Total	27.76				$1,606.78
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	8.22	$227.53	$46.66	$186.65	$460.84
Ind. Labor & Material	2.71	$75.08	$0.00	$5.60	$80.68
State Sales Tax	0.00	$0.00	$1.75	$7.21	$8.96
QA/QC Impact	0.55	$15.13	$2.33	$9.61	$27.07
	11.48	$317.74	$50.74	$209.07	$577.55
Contractor Cost (0.15)					$86.63
Labor Contingency	3.44			Contingency (0.30)	$199.25
Task 30080 Total	14.92				$863.43
Subject 30080 Total	14.92				$863.43
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.10	$113.64	$23.29	$93.18	$230.11
Ind. Labor & Material	1.35	$37.50	$0.00	$2.80	$40.30
State Sales Tax	0.00	$0.00	$0.87	$3.60	$4.47
QA/QC Impact	0.27	$7.56	$1.16	$4.80	$13.52
	5.73	$158.70	$25.32	$104.38	$288.40
Contractor Cost (0.15)					$43.27
Labor Contingency	1.43			Contingency (0.25)	$82.93
Task 30106 Total	7.16				$414.60
Subject 30100 Total	7.16				$414.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.10	$113.64	$23.29	$93.18	$230.11
Ind. Labor & Material	1.35	$37.50	$0.00	$2.80	$40.30
State Sales Tax	0.00	$0.00	$0.87	$3.60	$4.47
QA/QC Impact	0.27	$7.56	$1.16	$4.80	$13.52
	5.73	$158.70	$25.32	$104.38	$288.40
Labor Contingency	1.43		Contractor Cost (0.15)		$43.27
			Contingency (0.25)		$82.93
Task 30116 Total	7.16				$414.60
Subject 30110 Total	7.16				$414.60
Category 30000 Total	57.01				$3,299.41
Area 30000 Total	57.01				$3,299.41
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	168.54	$4,666.69	$2,375.00	$662.92	$7,704.61
Ind. Labor & Material	55.62	$1,540.01	$0.00	$19.89	$1,559.90
State Sales Tax	0.00	$0.00	$89.07	$25.61	$114.68
QA/QC Impact	11.21	$310.33	$118.75	$34.14	$463.22
	235.37	$6,517.03	$2,582.82	$742.56	$9,842.41
Labor Contingency	58.84		Contractor Cost (0.15)		$1,476.36
			Contingency (0.25)		$2,829.70
Task 41070 Total	294.21				$14,148.47
Subject 41070 Total	294.21				$14,148.47
Category 41000 Total	294.21				$14,148.47
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$6.83	$222.88
State Sales Tax	0.00	$0.00	$22.75	$8.78	$31.53
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT (All costs in thousands of dollars)	MATERIALS	TOTAL
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33		Contractor Cost (0.15)		$11.20
			Contingency (0.40)		$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	644.97	$18,037.86	$16,291.93	$10,017.11	$44,346.90
Ind. Labor & Material	212.84	$5,952.49	$0.00	$300.51	$6,253.00
State Sales Tax	0.00	$0.00	$610.94	$386.91	$997.85
QA/QC Impact	42.89	$1,199.52	$814.60	$515.88	$2,530.00
	900.71	$25,189.87	$17,717.47	$11,220.41	$54,127.75
Labor Contingency	360.28		Contractor Cost (0.15)		$8,119.17
			Contingency (0.40)		$24,898.77
Task 43300 Total	1260.99				$87,145.69
Subject 43300 Total	1260.99				$87,145.69
Category 43000 Total	1463.06				$98,122.51
Area 40000 Total	1757.27				$112,270.98
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	186.36	$5,160.76	$748.90	$383.06	$6,292.72
Ind. Labor & Material	61.50	$1,703.05	$0.00	$11.49	$1,714.54
State Sales Tax	0.00	$0.00	$28.08	$14.80	$42.88
QA/QC Impact	12.39	$343.19	$37.45	$19.73	$400.37
	260.26	$7,207.00	$814.43	$429.08	$8,450.51
Labor Contingency	65.06		Contractor Cost (0.15)		$1,267.58
			Contingency (0.25)		$2,429.53
Task 51011 Total	325.32				$12,147.62
Subject 51010 Total	325.32				$12,147.62
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	322.13	$10,327.31	$877.04	$709.71	$11,914.06
Ind. Labor & Material	106.30	$3,408.01	$0.00	$21.29	$3,429.30
State Sales Tax	0.00	$0.00	$32.89	$27.41	$60.30
QA/QC Impact	21.42	$686.77	$43.85	$36.55	$767.17
	449.86	$14,422.09	$953.78	$794.96	$16,170.83
Labor Contingency	134.96		Contractor Cost (0.15)		$2,425.64
			Contingency (0.30)		$5,578.95
Task 51031 Total	584.82				$24,175.42
Subject 51030 Total	584.82				$24,175.42
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	22.43	$2,559.53	$153.95	$340.84	$3,054.32
Ind. Labor & Material	30.50	$844.64	$0.00	$12.93	$857.57
State Sales Tax	0.00	$0.00	$5.78	$13.17	$18.95
QA/QC Impact	6.15	$170.21	$7.70	$17.55	$195.46
	129.09	$3,574.38	$167.43	$381.79	$4,123.60
Labor Contingency	32.27		Contractor Cost (0.15)		$618.54
			Contingency (0.25)		$1,185.54
Task 51040 Total	161.36				$5,927.68
Subject 51040 Total	161.36				$5,927.68
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	149.48	$4,139.17	$4,232.70	$3,280.84	$11,652.71
Ind. Labor & Material	49.33	$1,365.93	$0.00	$98.43	$1,464.36
State Sales Tax	0.00	$0.00	$158.72	$126.72	$285.44
QA/QC Impact	9.94	$275.26	$211.64	$168.96	$655.86
	208.75	$5,780.36	$4,603.06	$3,674.95	$14,058.37
Labor Contingency	62.63		Contractor Cost (0.15)		$2,108.76
			Contingency (0.30)		$4,850.14
Task 51050 Total	271.38				$21,017.27
Subject 51050 Total	271.38				$21,017.27
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	10.51	$291.18	$940.56	$409.97	$1,641.71
Ind. Labor & Material	3.47	$96.09	$0.00	$12.30	$108.39
State Sales Tax	0.00	$0.00	$35.28	$15.84	$51.12
QA/QC Impact	0.70	$19.36	$47.02	$21.11	$87.49
	14.68	$406.63	$1,022.86	$459.22	$1,888.71
Labor Contingency	3.67		Contractor Cost (0.15)		$283.31
			Contingency (0.25)		$543.00
Task 51070 Total	18.35				$2,715.02
Subject 51070 Total	18.35				$2,715.02
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.58	$18.86	$185.29	$3.28	$207.43
Ind. Labor & Material	0.19	$6.22	$0.00	$0.10	$6.32
State Sales Tax	0.00	$0.00	$6.95	$0.13	$7.08
QA/QC Impact	0.04	$1.25	$9.27	$0.17	$10.69

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.80	$26.33	$201.51	$3.68	$231.52
Labor Contingency	0.20		Contractor Cost (0.15)		$34.72
			Contingency (0.25)		$66.56
Task 51080 Total	1.01				$332.80
Subject 51080 Total	1.01				$332.80
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.51	$17.46	$820.67	$101.95	$940.08
Ind. Labor & Material	0.17	$5.76	$0.00	$3.06	$8.82
State Sales Tax	0.00	$0.00	$30.78	$3.97	$34.75
QA/QC Impact	0.03	$1.16	$41.03	$5.25	$47.44
	0.72	$24.38	$892.48	$114.20	$1,031.06
Labor Contingency	0.18		Contractor Cost (0.15)		$154.66
			Contingency (0.25)		$296.43
Task 51090 Total	0.89				$1,482.15
Subject 51090 Total	0.89				$1,482.15
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	117.76	$3,868.51	$705.29	$719.47	$5,293.27
Ind. Labor & Material	38.86	$1,276.61	$0.00	$21.58	$1,298.19
State Sales Tax	0.00	$0.00	$26.45	$27.79	$54.24
QA/QC Impact	7.83	$257.26	$35.26	$37.05	$329.57
	164.45	$5,402.38	$767.00	$805.89	$6,975.27
Labor Contingency	49.34		Contractor Cost (0.15)		$1,046.30
			Contingency (0.30)		$2,406.47
Task 51100 Total	213.79				$10,428.04
Subject 51100 Total	213.79				$10,428.04
Category 51000 Total	1576.91				$78,226.00
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	37.20	$1,267.40	$5,120.52	$265.88	$6,653.80
Ind. Labor & Material	12.28	$418.24	$0.00	$7.98	$426.22
State Sales Tax	0.00	$0.00	$192.02	$10.27	$202.29
QA/QC Impact	2.47	$84.28	$256.03	$13.69	$354.00
	51.95	$1,769.92	$5,568.57	$297.82	$7,636.31
Labor Contingency	12.99		Contractor Cost (0.15)		$1,178.71
			Contingency (0.25)		$2,192.45
Task 52010 Total	64.94				$10,977.20
Subject 52010 Total	64.94				$10,977.20
52020 Communications					
52020 Communications					
Direct Cost	5.33	$181.71	$2.58	$16.53	$200.82
Ind. Labor & Material	1.76	$59.96	$0.00	$0.50	$60.46
State Sales Tax	0.00	$0.00	$0.10	$0.64	$0.74
QA/QC Impact	0.35	$12.08	$0.13	$0.85	$13.06
	7.45	$253.75	$2.81	$18.52	$275.08
Labor Contingency	2.23		Contractor Cost (0.15)		$41.26
			Contingency (0.30)		$94.91
Task 52020 Total	9.68				$411.25
Subject 52020 Total	9.68				$411.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	136.62	$3,782.79	$15,660.70	$6,972.95	$26,416.44
Ind. Labor & Material	45.08	$1,248.32	$0.00	$209.19	$1,457.51
State Sales Tax	0.00	$0.00	$587.28	$269.33	$856.61
QA/QC Impact	9.09	$251.56	$783.03	$359.11	$1,393.70
	190.79	$5,282.67	$17,031.01	$7,810.58	$30,124.26
Labor Contingency	57.24		Contractor Cost (0.15)		$4,518.65
			Contingency (0.30)		$10,392.87
Task 52040 Total	248.02				$45,035.78
Subject 52040 Total	248.02				$45,035.78
Category 52000 Total	322.64				$56,424.23
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	129.04	$4,186.11	$1,233.76	$2,788.50	$8,208.37
Ind. Labor & Material	42.58	$1,381.42	$0.00	$83.66	$1,465.08
State Sales Tax	0.00	$0.00	$46.26	$107.71	$153.97
QA/QC Impact	8.58	$278.38	$61.69	$143.61	$483.68
	180.21	$5,845.91	$1,341.71	$3,123.48	$10,311.10
Labor Contingency	63.07		Contractor Cost (0.15)		$1,546.67
			Contingency (0.35)		$4,150.21
Task 53000 Total	243.28				$16,007.98
Subject 53000 Total	243.28				$16,007.98
Category 53000 Total	243.28				$16,007.98
Area 50000 Total	2142.84				$150,658.21

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 4143.67 x 10^3 man-hrs $276,253.70 *

Case 6

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Summary Cost Matrix (Table 1)

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Surface Facility Operating Costs

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Underground Facilities Management and Integration Cost Estimate

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Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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TABLE 1. MRS SYSTEMS STUDY - CASE 6 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$249.96	$27.10	$26.52	$53.62	$16.57	$6.87	$23.43	$327.01
	1000	SUPPORT CONTRACTOR	$38.25	$0.00	$0.00	$0.00	$3.31	$0.90	$4.21	$42.46
	1010	Surface	$22.32			$0.00		$0.90	$0.90	
	1020	Subsurface	$15.93			$0.00	$3.31		$3.31	
	2000	ARCHITECT-ENGINEER	$152.99	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26	$3.58	$16.84	$169.83
	2010	Surface	$89.28	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$63.71	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26		$13.26	
	3000	CONSTRUCTION MANAGEMENT	$57.71	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$60.10
	3010	Surface	$34.51	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$23.20			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.10	$0.52	$3.62			$0.00	$3.62
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$89.30	$16.17	$105.47	$1.51	$39.85	$41.36	$324.84
	11000	EMPLOYEE TRANSPORTATION		$81.41	$13.83	$95.24	$1.20		$1.20	$96.44
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$335.11	$1,526.44	$214.67	$1,741.10	$43.73	$20.46	$64.19	$2,140.41
4.3.2.1	21000	WASTE HANDLING FACILITY	$199.21	$535.11	$28.82	$563.93	XXXXXXXXXX	$13.30	$13.30	$776.44
	21100	Waste Handling Building 1:	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	$0.00	
4.3.2.1.2	21102	Building/Structures	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$0.00			$0.00	XXXXXXXXXX		$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 6 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$153.89	$0.00	$0.00	$0.00	XXXXXXXXXXX	$9.10	$9.10	
4.3.2.1.9	21202	Building/Structures	$69.89			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$20.55			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$10.83			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$7.66			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$40.56			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$4.40			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$45.32	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.20	$4.20	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.02			$0.00	XXXXXXXXXXX	$1.69	$1.69	
	21502	Vehicle Wash Facility	$0.79			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.43			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$88.48	$964.55	$170.38	$1,134.94	$32.37	$4.45	$36.82	$1,260.24
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.02		$19.02	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.49			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$10.53			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$11.36	$2.71	$14.07	$103.74
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$10.93	$0.67	$11.60	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04	$10.93		$10.93	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 6 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.15	$2.04	$2.19	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.15		$0.15	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.15	$0.00	$0.15	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.15		$0.15	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.13		$0.13	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.68	XXXXXXXXXXX	$3.68	$99.87
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.81	XXXXXXXXXXX	$1.81	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.98	XXXXXXXXXXX	$0.98	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXX	$0.47	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXX	$0.47	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXX	$0.42	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXX	$0.42	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$151.22	$961.82	$49.47	$1,011.29	$122.63	XXXXXXXXXXX	$122.63	$1,285.14
4.3.4.1	41000	DEVELOPMENT	$130.46	$740.92	$47.02	$787.95	$15.44	XXXXXXXXXXX	$15.44	$933.84
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$84.55	$538.73	XXXXXXXXXXX	$538.73	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXX	$14.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXX	$47.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXX	$22.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41024	Emplacement Drifts	$28.31	$223.24	XXXXXXXXXXX	$223.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$22.62	$231.06	XXXXXXXXXXX	$231.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41060	Excavated Material Handling	$13.02	$33.62	$0.00	$33.62	$0.00	XXXXXXXXXXX	$0.00	
	41070	General Maintenance	$9.20	$74.80	$47.02	$121.83	$15.44	XXXXXXXXXXX	$15.44	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.76	$220.90	$2.45	$223.35	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$244.11
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$155.48	$0.00	$155.48	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.93	$1.47	$0.00	$1.47	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	

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05-Jan-89 REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 6 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$107.19	XXXXXXXXXXX	$107.19	$107.19
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$4.98	XXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$3.04	XXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.69	XXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.59	XXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.56	XXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.12	XXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$96.21	XXXXXXXXXXX	$96.21	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$105.26	$728.53	$197.29	$925.82	$164.81	XXXXXXXXXXX	$164.81	$1,195.90
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$82.55	$586.30	$116.51	$702.81	$85.75	XXXXXXXXXXX	$85.75	$871.11
4.3.5.1.1	51010	Material Support, Receiving/Warehousing	$12.96	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXX	$13.32	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXX	$13.32	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$43.12	$389.14	$33.44	$422.58	$24.79	XXXXXXXXXXX	$24.79	
	51031	Development Area	$42.12	$271.49	$24.42	$295.91	$24.79	XXXXXXXXXXX	$24.79	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$6.64	XXXXXXXXXXX	$6.64	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.23	$29.18	$10.96	$40.15	$24.04	XXXXXXXXXXX	$24.04	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$8.77	$45.85	$0.00	$45.85	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.1.7	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$3.08	XXXXXXXXXXX	$3.08	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.38	XXXXXXXXXXX	$0.38	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.68	XXXXXXXXXXX	$1.68	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$11.82	XXXXXXXXXXX	$11.82	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$60.92	XXXXXXXXXXX	$60.92	$124.20
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$12.39	XXXXXXXXXXX	$12.39	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.46	XXXXXXXXXXX	$0.46	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$48.07	XXXXXXXXXXX	$48.07	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$18.14	XXXXXXXXXXX	$18.14	$200.59
		TOTAL REPOSITORY	$1,085.14	$3,347.87	$520.05	$3,867.93	$352.93	$67.17	$420.10	$5,373.17
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$31.12
	61000	SPENT FUEL	XXXXXXXXXXXXXX	$0.00	$0.00	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.00
	61010	Intact PWR	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.00
	63000	OTHER WASTE	XXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$31.12
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXX	$16.00		$16.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	99999	TOTAL REPOSITORY, with EMPLACEMENT CONTAINERS	$1,085.14	$3,370.26	$528.79	$3,899.05	$352.93	$67.17	$420.10	$5,404.29

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 6
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR DA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.4	2,383.5	0.0	3,020.9	637.4	89.4	25%	936.9	4,684.6	320.1	5,004.7	10%	365.8	18.3	96.0	480.1	5,484.8
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9	25%	588.1	2,940.6	200.6	3,141.2	10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0	25%	79.4	396.8	27.2	424.0	10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.2	0.0	0.0	822.2	822.2	0.0	20%	328.9	1,973.3	138.1	2,111.4	5%	82.2	4.1	17.3	103.6	2,215.0
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0	20%	696.1	4,176.5	292.4	4,468.9	5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3	20%	36.5	218.8	15.2	234.0	5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0	20%	143.5	860.9	60.3	921.2	5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.8	448.4	0.0	697.2	248.8	16.8	20%	192.6	1,155.4	79.5	1,234.9	5%	47.3	2.4	9.9	59.6	1,294.5
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,328.0	9,219.9	2,076.1	267.9	30%	3,469.2	15,033.1	1,027.9	16,061.0	15%	1,694.4	84.7	533.7	2,312.8	18,373.8
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.5	0.0	42.0	16.5	1.0	20%	11.9	71.4	4.9	76.3	5%	2.9	0.1	0.6	3.6	79.9
		SUBTOTAL 120 - ON SITE	222.4	$6,383.5	$6,316.4	$5,501.6	$18,201.5	$6,383.5	$443.3		$6,483.1	$31,511.4	$2,166.2	$33,677.6		$2,671.9	$133.7	$771.8	$3,577.4	$37,255.0
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1	25%	2,294.6	11,473.0	784.7	12,257.7	10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8	30%	1,598.4	6,926.5	477.0	7,403.5	15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.6	68,508.6	0.0	82,398.2	13,889.6	2,569.1	25%	24,714.2	123,571.1	8,425.2	131,996.3	10%	9,628.8	481.4	2,527.6	12,637.8	144,634.1
	130.50	OFF SITE - UTILITIES	39.1	1,133.5	949.4	224.7	2,307.6	1,133.5	44.0	30%	1,045.5	4,530.6	313.1	4,843.7	15%	516.2	25.8	162.6	704.6	5,548.3
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0	25%	6,961.1	34,805.6	2,386.7	37,192.3	10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.6	$24,233.6	$92,517.8	$230.0	$116,981.4	$24,233.6	$3,478.0		$36,613.8	$181,306.8	$12,386.7	$193,693.5		$14,555.7	$727.7	$3,889.3	$19,172.7	$212,866.2
4.3.1		TOTAL 100 - SITE	1,058.0	$30,617.1	$98,834.2	$5,731.6	$135,182.9	$30,617.1	$3,921.3		$43,096.9	$212,818.2	$14,552.9	227,371.1		$17,227.6	$861.4	$4,661.1	$22,750.1	$250,121.2
	211.02	MHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.03	MHB I - HOT CELL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.04	MHB I - UTILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.05	MHB I - HVAC EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.06	MHB I - HANDL/PACK EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.07	MHB I - SUPPORT FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	588.4	17,064.9	14,224.9	997.0	32,286.8	17,064.9	570.8	40%	19,969.0	69,891.5	4,836.5	74,728.0	25%	12,337.9	616.9	5,181.9	18,136.7	92,864.7
	212.03	MHB II - HOT CELL EQUIP	72.3	2,097.7	0.0	10,104.1	12,201.8	2,097.7	378.9	40%	5,871.4	20,549.8	1,401.4	21,951.2	25%	3,574.9	178.7	1,501.4	5,255.0	27,206.2
	212.04	MHB II - UTILITIES	94.8	2,613.9	972.7	1,443.4	5,030.0	2,613.9	90.6	40%	3,093.8	10,828.3	749.1	11,577.4	25%	1,911.0	95.6	802.6	2,809.2	14,386.6
	212.05	MHB II - HVAC EQUIPMENT	43.3	1,255.7	1,357.4	1,493.6	4,106.7	1,255.7	106.9	40%	2,187.7	7,657.0	525.5	8,182.5	25%	1,340.6	67.0	563.0	1,970.6	10,153.1
	212.06	MHB II - HANDL/PACK EQUIP	145.0	4,204.1	0.0	19,817.6	24,021.7	4,204.1	743.2	40%	11,587.6	40,556.6	2,766.1	43,322.7	25%	7,056.5	352.8	2,963.7	10,373.0	53,695.7
	212.07	MHB II - SUPPORT FAC.	7.6	221.3	0.0	2,599.9	2,821.2	221.3	97.5	40%	1,256.0	4,396.0	298.2	4,694.2	25%	760.6	38.0	319.4	1,118.0	5,812.2
		SUBTOTAL 212 - MHB II	951.4	$27,457.6	$16,555.0	$36,455.6	$80,468.2	$27,457.6	$1,987.9		$43,965.5	$153,879.2	$10,576.8	$164,456.0		$26,981.5	$1,349.0	$11,332.0	$39,662.5	$204,118.5
	215.01	WASTE TREATMENT BUILDING	115.6	3,351.5	2,717.5	4,605.3	10,674.3	3,351.5	274.6	40%	5,720.2	20,020.6	1,374.5	21,395.1	25%	3,506.5	175.3	1,472.7	5,154.5	26,549.6
	215.02	VEHICLE WASH FACILITY	4.7	135.3	171.7	152.0	459.0	135.3	12.1	30%	181.9	788.3	54.1	842.4	15%	89.1	4.5	28.1	121.7	964.1
	215.03	DECONTAMINATION BUILDING	20.0	579.1	906.5	516.5	2,002.1	579.1	53.4	30%	790.4	3,425.0	234.9	3,659.9	15%	387.2	19.4	122.0	528.6	4,189.5
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.5	10,756.8	4,045.2	251.7	40%	6,021.5	21,075.2	1,450.6	22,525.8	25%	3,709.5	185.0	1,554.2	5,439.7	27,965.5
		SUBTOTAL 215 - OTHER	279.9	$8,111.1	$7,360.8	$8,420.3	$23,892.2	$8,111.1	$591.8		$12,714.0	$45,309.1	$3,114.1	$48,423.2		$7,683.3	$384.2	$3,177.0	$11,244.5	$59,667.7
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	1,231.3	$35,568.7	$23,915.8	$44,875.9	$104,360.4	$35,568.7	$2,579.7		$56,679.5	$199,188.3	$13,690.9	$212,879.2		$34,664.8	$1,733.2	$14,509.0	$50,907.0	$263,786.2

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 6
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.0	889.0	1,875.2	509.2	51.2	25%	608.9	3,044.5	208.6	3,253.1	10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2	25%	303.3	1,516.4	104.6	1,621.0	10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.7	568.0	803.2	1,985.9	614.7	51.4	30%	795.6	3,447.6	236.7	3,684.3	15%	390.1	19.5	122.9	532.5	4,216.8
	220.40	MAINTENANCE FACILITIES	49.4	1,433.2	1,828.3	415.4	3,676.9	1,433.2	84.1	25%	1,298.6	6,492.8	447.1	6,939.9	10%	511.0	25.6	134.2	670.8	7,610.7
	220.50	ADMIN/PERSONNEL FACILITIES	89.1	2,582.9	2,290.6	536.3	5,409.8	2,582.9	106.0	30%	2,429.6	10,528.3	727.3	11,255.6	15%	1,198.9	59.9	377.6	1,636.4	12,892.0
	220.60	MOCK-UP BUILDING	20.7	595.9	957.0	501.2	2,054.1	595.9	54.7	30%	811.4	3,516.1	241.1	3,757.2	15%	397.5	19.9	125.2	542.6	4,299.8
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.1	4,477.5	375.5	7,327.1	2,474.1	182.0	25%	2,495.8	12,479.0	857.6	13,336.6	10%	980.1	49.0	257.3	1,286.4	14,623.0
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1	25%	150.7	753.4	51.9	805.3	10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.7	222.1	3,348.0	4,009.8	439.7	133.9	30%	1,375.0	5,958.4	404.9	6,363.3	15%	667.4	33.4	210.2	911.0	7,274.3
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5	30%	451.6	1,957.0	135.1	2,092.1	15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.5	61.1	37.2	0.9	25%	24.8	124.0	8.6	132.6	10%	9.8	0.5	2.6	12.9	145.5
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6	25%	195.5	977.4	66.3	1,043.7	10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.6	2,925.2	4,046.7	1,078.9	111.3	25%	1,309.2	6,546.1	448.5	6,994.6	10%	512.6	25.6	134.6	672.8	7,667.4
	221.90	SEWAGE FACILITY	15.1	439.0	419.3	8.4	866.7	439.0	16.0	25%	330.4	1,652.1	114.2	1,766.3	10%	130.6	6.5	34.3	171.4	1,937.7
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1	30%	4,683.5	20,295.2	1,374.8	21,670.0	15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.8	0.0	5,186.5	5,210.3	23.8	194.5	25%	1,357.2	6,785.8	458.0	7,243.8	10%	523.4	26.2	137.4	687.0	7,930.8
	222.42	BATCH PLANT	10.2	296.2	0.6	1,273.0	1,569.8	296.2	47.8	25%	478.5	2,392.3	163.3	2,555.6	10%	186.6	9.3	49.0	244.9	2,800.5
4.3.2.2	TOTAL	220 - BALANCE OF PLANT	427.9	$12,406.0	$12,585.1	$30,359.4	$55,350.5	$12,406.0	$1,610.3		$19,099.6	$88,466.4	$6,048.6	$94,515.0		$8,489.8	$424.5	$2,498.7	$11,413.0	$105,928.0
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.7	159.0	35.7	348.4	153.7	7.3	30%	152.8	662.2	45.7	707.9	15%	75.3	3.8	23.7	102.8	810.7
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1221.7	1,857.2	503.3	3,582.2	1,221.7	88.5	35%	1,712.3	6,604.7	454.0	7,058.7	20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.6	6,572.5	6,041.0	17,455.1	4,841.6	473.0	35%	7,969.4	30,739.1	2,107.0	32,846.1	20%	4,459.3	223.0	1,638.8	6,321.1	39,167.2
	TOTAL	230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8		$9,834.5	$38,006.0	$2,606.7	$40,612.7		$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0	GRAND	TOTAL SURFACE FACILITIES	2,931.6	$84,808.8	$143,923.8	$87,546.9	$316,279.5	$84,808.8	$8,680.1		$128,710.5	$538,478.9	$36,899.1	$575,378.0		$65,877.6	$3,293.9	$23,684.4	$92,855.9	$668,233.9

JOB 16039 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 6
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	4	6	9	11	14	15	15	15	
BUSES AT $100.0 K per YEAR	COST	$200	$400	$600	$900	$1,100	$1,400	$1,500	$30,000	$1,500	$37,600
	SUBTOTAL - 100	$226	$426	$626	$1,160	$1,360	$1,660	$1,760	$35,200	$1,760	$44,178
CONTINGENCY @ 20%		$45	$85	$125	$232	$272	$332	$352	$7,040	$352	$8,836
	TOTAL - 100	$271	$511	$751	$1,392	$1,632	$1,992	$2,112	$42,240	$2,112	$53,014
210 - WASTE HANDLING FACILITIES											
LABOR:	# of PEOPLE	11	30	49	69	89	109	115	115	115	
COST PER YR/ PERSON $52,700	COST	$580	$1,581	$2,582	$3,636	$4,690	$5,744	$6,061	$121,210	$6,061	$152,145
OPERATING SUPPLIES @ 5.0% of LABOR		$29	$79	$129	$182	$235	$287	$303	$6,061	$303	$7,607
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$1,320	$1,320	$1,320	$7,920	$7,920	$7,920	$7,920	$158,400	$7,920	$201,960
Capital Cost = 264 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$1,349	$1,399	$1,449	$8,102	$8,155	$8,207	$8,223	$164,461	$8,223	$209,567
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	1	1	1	10	10	10	10	10	10	
@ $.05/Kwhr	COST	$50	$50	$50	$500	$500	$500	$500	$10,000	$500	$12,650
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$51	$52	$54	$304	$306	$308	$308	$6,167	$308	$7,859
	SUBTOTAL - 210	$2,029	$3,083	$4,136	$12,542	$13,651	$14,759	$15,092	$301,838	$15,092	$382,221
CONTINGENCY @ 40%		$812	$1,233	$1,654	$5,017	$5,460	$5,904	$6,037	$120,735	$6,037	$152,888
	TOTAL - 210	$2,841	$4,316	$5,790	$17,559	$19,111	$20,663	$21,129	$422,573	$21,129	$535,109
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	43	115	187	256	346	416	452	452	452	
COST PER YR/ PERSON $52,700	COST	$2,266	$6,061	$9,855	$13,491	$18,234	$21,923	$23,820	$476,408	$23,820	$595,879
OPERATING SUPPLIES @ 5.0% of LABOR		$113	$303	$493	$675	$912	$1,096	$1,191	$23,820	$1,191	$29,794
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$770	$770	$770	$3,080	$3,080	$3,080	$3,080	$61,600	$3,080	$79,310
Capital Cost = 154 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$883	$1,073	$1,263	$3,755	$3,992	$4,176	$4,271	$85,420	$4,271	$109,104
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.6	2.6	2.6	26	26	26	26	26	26	
@ $.05/Kwhr	COST	$130	$130	$130	$1,300	$1,300	$1,300	$1,300	$26,000	$1,300	$32,890
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$33	$40	$47	$141	$150	$157	$160	$3,203	$160	$4,091
	SUBTOTAL - 220	$3,313	$7,304	$11,295	$18,687	$23,676	$27,556	$29,552	$591,032	$29,552	$741,964
CONTINGENCY @ 30%		$994	$2,191	$3,388	$5,606	$7,103	$8,267	$8,865	$177,309	$8,865	$222,589
	TOTAL - 220	$4,306	$9,495	$14,683	$24,293	$30,778	$35,823	$38,417	$768,341	$38,417	$964,554
TOTAL ANNUAL O & M COST		$7,418	$14,322	$21,225	$43,243	$51,521	$58,478	$61,658	$1,233,154	$61,658	$1,552,676

JOB 16039 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 6
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	9	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$900	$4,600	$100	$5,600	$1,000	$44,200
	SUBTOTAL - 100	$978	$6,394	$178	$7,550	$1,260	$52,988
CONTINGENCY @ 20%		$196	$1,279	$36	$1,510	$252	$10,598
	TOTAL - 100	$1,174	$7,673	$214	$9,060	$1,512	$63,586
210 - WASTE HANDLING FACILITIES							
LABOR:	# of PEOPLE	68	12	6		0	
COST PER YR/ PERSON $52,700	COST	$3,584	$14,545	$316	$18,445	$0	$170,590
OPERATING SUPPLIES @ 5.0% of LABOR		$179	$727	$16	$922	$0	$8,529
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$26	$607	$26	$660	$0	$202,620
Capital Cost = 264 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$206	$1,334	$42	$1,582	$0	$211,149
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$13,150
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$8	$50	$2	$59	$0	$7,918
	SUBTOTAL - 210	$3,817	$16,390	$380	$20,587	$0	$402,808
CONTINGENCY @ 40%		$1,527	$6,556	$152	$8,235	$0	$161,123
	TOTAL - 210	$5,344	$22,946	$532	$28,821	$0	$563,931
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	252	64	32		19	
COST PER YR/ PERSON $52,700	COST	$13,280	$77,574	$1,686	$92,541	$10,013	$698,433
OPERATING SUPPLIES @ 5.0% of LABOR		$664	$3,879	$84	$4,627	$501	$34,922
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$770	$17,710	$770	$19,250	$1,540	$100,100
Capital Cost = 154 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,434	$21,589	$854	$23,877	$2,041	$135,022
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$49,140
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$54	$810	$32	$895	$77	$5,063
	SUBTOTAL - 220	$15,318	$112,623	$3,123	$131,064	$14,630	$887,658
CONTINGENCY @ 30%		$4,595	$33,787	$937	$39,319	$4,389	$266,297
	TOTAL - 220	$19,914	$146,410	$4,060	$170,383	$19,019	$1,153,955
TOTAL ANNUAL O & M COST		$26,431	$177,028	$4,805	$208,264	$20,531	$1,781,472

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 6
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST		INDIRECT COST @ %	SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10%	82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE													
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10%	1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10%	245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE													
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.4	75%	100.4	505.8	35%	177.0	10%	68.3	0.0	(0.1)	751.0
	120.70	ON SITE - DRAINAGE CONTROL		0.0													
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10%	9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10%	48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10%	1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9		$457.9	$0.0	$0.9	$5,037.0
	130.11	OFF SITE - ROADS (NEW)															
	130.13	OFF SITE - BRIDGES															
	130.21	OFF SITE - RAIL (NEW)															
	130.50	OFF SITE - UTILITIES															
	140.00	MONUMENTS															
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
4.3.1	TOTAL 100 - SITE		60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9		$457.9	$0.0	$0.9	$5,037.0
	211.02	MHB I - BUILDING/STRUCTURES															
	211.03	MHB I - HOT CELL EQUIPMENT															
	211.04	MHB I - UTILITIES															
	211.05	MHB I - HVAC EQUIPMENT															
	211.06	MHB I - HANDL/PACK EQUIP															
	211.07	MHB I - SUPPORT FACILITIES															
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	119.5	3,122.5	19.6	85.0	3,227.1	75%	2,341.9	5,569.0	35%	1,949.2	10%	751.8	827.0		9,097.0
	212.03	MHB II - HOT CELL EQUIP		INCLUDED ABOVE													
	212.04	MHB II - UTILITIES		INCLUDED ABOVE													
	212.05	MHB II - HVAC EQUIPMENT		INCLUDED ABOVE													
	212.06	MHB II - HANDL/PACK EQUIP		INCLUDED ABOVE													
	212.07	MHB II - SUPPORT FAC.		INCLUDED ABOVE													
		SUBTOTAL 212 - MHB II	119.5	$3,122.5	$19.6	$85.0	$3,227.1		$2,341.9	$5,569.0		$1,949.2		$751.8	$827.0	$0.0	$9,097.0
	215.01	WASTE TREATMENT BUILDING	18.2	479.8	10.0	187.1	676.9	75%	359.9	1,036.8	35%	362.9	10%	140.0	154.0	0.3	1,694.0
	215.02	VEHICLE WASH FACILITY	0.9	23.7	0.0	0.0	23.7	75%	17.8	41.5	35%	14.5	10%	5.6	6.2	0.2	68.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10%	21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10%	179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	44.1	$1,162.6	$20.7	$512.1	$1,695.4		$872.0	$2,567.4		$898.6		$346.7	$381.3	$0.1	$4,194.1
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		163.6	$4,285.1	$40.3	$597.1	$4,922.5		$3,213.9	$8,136.4		$2,847.8		$1,098.5	$1,208.3	$0.1	$13,291.1

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 6
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10%	15.6	17.1	0.6	189.0
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10%	12.5	13.7	0.3	151.0
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10%	19.9	21.9	(0.2)	241.0
	220.40	MAINTENANCE FACILITIES	8.1	213.5	0.0	0.0	213.5	75%	160.2	373.7	35%	130.8	10%	50.5	55.5	(0.5)	610.0
	220.50	ADMIN/PERSONNEL FACILITIES	12.6	332.2	0.0	0.0	332.2	75%	249.1	581.3	35%	203.4	10%	78.5	86.3	0.5	950.0
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10%	25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10%	49.8	54.8	0.1	603.0
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10%	6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10%	13.1	14.4	(0.3)	158.0
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10%	17.4	19.2		211.0
	221.10	EXPLOSIVE MAGAZINES	0.2	5.3	0.0	0.0	5.3	75%	4.0	9.3	35%	3.2	10%	1.2	1.4	(0.1)	15.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10%	2.1	2.3	0.3	26.0
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10%	23.7	26.0	(0.3)	286.0
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10%	12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10%	28.7	31.5	0.2	347.0
	222.30	STANDARD EQUIPMENT		0.0													
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10%	10.2	11.3		124.0
4.3.2.2	TOTAL	220 - BALANCE OF PLANT	58.7	$1,547.5	$0.0	$0.0	$1,547.5		$1,176.7	$2,724.2		$953.4		$367.7	$404.5	$1.0	$4,450.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10%	7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10%	48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10%	168.2	185.0	0.3	2,035.2
	TOTAL	230 - SURFACE SHAFT FAC.	35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8		$223.7	$246.0	$0.2	$2,706.1
4.0	GRAND	TOTAL SURFACE FACILITIES	319.1	$8,386.8	$311.9	$597.1	$9,295.8		$6,612.6	$15,908.4		$5,567.9		$2,147.8	$1,858.8	$2.2	$25,485.1

03-Nov-88

MRS SYSTEM STUDY - CASE 6
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
C:\LOTUS\CONT_C6 REVISION "C"

WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTEN-TION ($1000s)	CONTIN-GENCY	TOTAL COSTS ($1000s)
MVHLW.	DHLW	0	$0	$0	INCLUDED	$0
DHLW	DHLW	0	$0	$0	INCLUDED	$0
INTACT PWR		0	$0	$0	INCLUDED	$0
INTACT PWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED PWR		0	$0	$0	INCLUDED	$0
INTACT BWR and/or PWR/BWR MIXED		0	$0	$0	INCLUDED	$0
INTACT BWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED BWR		0	$0	$0	INCLUDED	$0
PWR HARDWARE		0	$0	$0	INCLUDED	$0
BWR HARDWARE		0	$0	$0	INCLUDED	$0
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		228		$6,384	$0	$6,384
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		540		$15,120	$0	$15,120
CONTACT HANDLED WASTE						$16,000
						$31,120

MRS STUDY CASES 2,4,6, AND 7
MANAGEMENT AND INTEGRATION COST ESTIMATE
task:2605A138
FILE = ENG-2467.WK1 (RANGE=MGTINT)
06-Oct-88 02:53 PM All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
02020	ARCHITECT-ENGINEER - SUBSURFACE			PHASE 1	PHASE 2	PHASE 3	PHASE 4
		CONSTRUCTION		$38,682			
		EMPLACEMENT		$21,834			
		CARETAKER		$3,197			
		CLOSURE					$13,255
				$63,713	$0	$0	$13,255
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$15,928	$0	$0	. $3,314
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $331,481 =====>		$23,204			
		of which	85%	$19,723 is labor			
		and	15%	$3,481 is materials and equipment.			
		Labor converts to at $100k per FTE.		197.23 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			29,031,300	5,251,300	
		CONSULTANT COST			$1,597	$289	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)	DURATION			24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)	PERSONS			605	109	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.	40 PER BUS			$36,289	$7,111	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$548.88	$0.00	$25.72	$574.60
State Sales Tax	0.00	$0.00	$37.87	$33.12	$70.99
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,213.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.33	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.54	$461.19
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.92	$337.99
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.12
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$43.33	$2,772.89
State Sales Tax	0.00	$0.00	$71.22	$55.78	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.14
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$9.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.36	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.99	$243.68
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.80	$0.00	$27.74	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.69	$0.00	$13.85	$198.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.89
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	218.96	$6,063.05	$5,763.68	$4,427.93	$16,254.66
Ind. Labor & Material	72.26	$2,000.81	$0.00	$132.84	$2,133.65
State Sales Tax	0.00	$0.00	$216.14	$171.03	$387.17
QA/QC Impact	14.56	$403.19	$288.18	$228.04	$919.41
	305.78	$8,467.05	$6,268.00	$4,959.84	$19,694.89
Labor Contingency	76.44		Contractor Cost (0.15)		$2,952.27
			Contingency (0.25)		$5,662.29
Task 41024 Total	382.22				$28,311.42
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	95.73	$2,650.64	$7,336.32	$2,582.15	$12,569.11
Ind. Labor & Material	31.58	$874.71	$0.00	$77.46	$952.17
State Sales Tax	0.00	$0.00	$275.12	$99.74	$374.86
QA/QC Impact	6.37	$176.27	$366.81	$132.98	$676.06
	133.69	$3,701.62	$7,978.25	$2,892.33	$14,572.20
Labor Contingency	46.79		Contractor Cost (0.15)		$2,185.84
			Contingency (0.35)		$5,865.31
Task 41025 Total	180.48				$22,623.35
Subject 41020 Total	851.59				$84,552.54
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$1,689.82	$0.00	$1,689.82
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$63.37	$0.00	$63.37
QA/QC Impact	0.00	$0.00	$84.49	$0.00	$84.49
	0.00	$0.00	$1,837.68	$0.00	$1,837.68
Labor Contingency	0.00		Contractor Cost (0.15)		$275.65
			Contingency (0.35)		$739.67
Task 41045 Total	0.00				$2,853.00
Subject 41040 Total	0.00				$2,853.00
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	62.57	$1,888.97	$3,388.64	$2,130.93	$7,408.54
Ind. Labor & Material	20.65	$623.36	$0.00	$63.93	$687.29
State Sales Tax	0.00	$0.00	$127.07	$82.31	$209.38
QA/QC Impact	4.16	$125.62	$169.44	$109.74	$404.80
	87.38	$2,637.95	$3,685.15	$2,386.91	$8,710.01
Labor Contingency	26.21		Contractor Cost (0.15)		$1,306.50
			Contingency (0.30)		$3,004.96
Task 41060 Total	113.59				$13,021.47
Subject 41060 Total	113.59				$13,021.47
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	66.17	$1,832.12	$3,410.11	$121.09	$5,363.32
Ind. Labor & Material	21.84	$604.60	$0.00	$3.63	$608.23
State Sales Tax	0.00	$0.00	$127.88	$4.68	$132.56
QA/QC Impact	4.40	$121.84	$170.51	$6.24	$298.59
	92.40	$2,558.56	$3,708.50	$135.64	$6,402.70
Labor Contingency	23.10		Contractor Cost (0.15)		$960.40
			Contingency (0.25)		$1,840.79
Task 41070 Total	115.51				$9,203.89
Subject 41070 Total	115.51				$9,203.89
Category 41000 Total	1263.70				$130,458.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.68	$0.00	$3.26	$15.27
State Sales Tax	0.00	$0.00	$227.87	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$2,325.37	$0.00	$2,325.37
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$87.20	$0.00	$87.20
QA/QC Impact	0.00	$0.00	$116.27	$0.00	$116.27
	0.00	$0.00	$2,528.84	$0.00	$2,528.84
Labor Contingency	0.00		Contractor Cost (0.15)		$379.33
			Contingency (0.35)		$1,017.86
Task 42030 Total	0.00				$3,926.03
Subject 42030 Total	0.00				$3,926.03
Category 42000 Total	2.09				$20,761.30
Area 40000 Total	1265.79				$151,219.41
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.75	$1,074.95
State Sales Tax	0.00	$0.00	$37.14	$9.97	$47.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$63.84	$63.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	545.42	$17,480.23	$2,230.17	$1,195.22	$20,905.62
Ind. Labor & Material	179.99	$5,768.48	$0.00	$35.86	$5,804.34
State Sales Tax	0.00	$0.00	$83.63	$46.17	$129.80
QA/QC Impact	36.27	$1,162.44	$111.51	$61.55	$1,335.50
	761.68	$24,411.15	$2,425.31	$1,338.80	$28,175.26
Labor Contingency	228.50		Contractor Cost (0.15)		$4,226.29
			Contingency (0.30)		$9,720.47
Task 51031 Total	990.19				$42,122.02
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.29
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	999.01				$43,121.53
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.78	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.27	$14.42
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	13.76	$372.66	$24.21	$243.54	$640.41
Ind. Labor & Material	4.44	$122.98	$0.00	$7.31	$130.29
State Sales Tax	0.00	$0.00	$0.90	$9.41	$10.31
QA/QC Impact	0.89	$24.78	$1.21	$12.54	$38.53
	18.79	$520.42	$26.32	$272.80	$819.54
Labor Contingency	5.64		Contractor Cost (0.15)		$122.93
			Contingency (0.30)		$282.74
Task 51050 Total	24.43				$1,225.21
Subject 51050 Total	24.43				$1,225.21
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	80.82	$2,237.93	$1,851.62	$651.50	$4,741.05
Ind. Labor & Material	26.67	$738.52	$0.00	$19.54	$758.06
State Sales Tax	0.00	$0.00	$69.44	$12.16	$82.60
QA/QC Impact	5.37	$148.82	$92.58	$33.55	$274.95
	112.87	$3,125.27	$2,013.64	$729.75	$5,868.66
Labor Contingency	33.86		Contractor Cost (0.15)		$880.30
			Contingency (0.30)		$2,024.69
Task 51060 Total	146.73				$8,773.65
Subject 51060 Total	146.73				$8,773.65
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.91	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.49
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$51.97
			Contingency (0.25)		$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.26
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.68	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.95
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1588.89				$82,554.16
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS - (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$409.64	$0.00	$20.10	$430.04
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.94	$31.93	$0.00	$0.59	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.52
			Contingency (0.30)		$56.39
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$2.55	$3.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.99
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1801.63				$105,264.83

* TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT. 3762.82 x 10^3 man-hrs $331,480.50

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$116.85	$2,979.45
State Sales Tax	0.00	$0.00	$25.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.34
			Contingency (0.30)		$5,934.78
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$35.77	$528.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.21	$214.22
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$127.56	$184.89
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68		Contractor Cost (0.15)		$1,506.33
			Contingency (0.25)		$2,887.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.15	$3,922.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86		Contractor Cost (0.15)		$4,910.56
			Contingency (0.25)		$9,411.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87		Contractor Cost (0.15)		$2,363.30
			Contingency (0.25)		$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	2280.19	$63,139.50	$14,226.87	$46,111.64	$123,478.01
Ind. Labor & Material	752.46	$20,836.04	$0.00	$1,383.35	$22,219.39
State Sales Tax	0.00	$0.00	$533.51	$1,781.06	$2,314.57
QA/QC Impact	151.63	$4,198.78	$711.34	$2,374.75	$7,284.87
	3184.29	$88,174.32	$15,471.72	$51,650.80	$155,296.84
Labor Contingency	796.07		Contractor Cost (0.15)		$23,294.53
			Contingency (0.25)		$44,647.84
Task 41024 Total	3980.36				$223,239.21
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1572.86	$43,546.36	$37,241.04	$42,420.92	$123,208.32
Ind. Labor & Material	518.99	$14,370.30	$0.00	$1,272.63	$15,642.93
State Sales Tax	0.00	$0.00	$1,398.54	$1,638.51	$3,037.05
QA/QC Impact	104.58	$2,895.83	$1,862.06	$2,184.68	$6,942.57
	2196.26	$60,812.49	$40,499.64	$47,516.74	$148,828.87
Labor Contingency	768.69		Contractor Cost (0.15)		$22,324.34
			Contingency (0.35)		$59,903.63
Task 41025 Total	2964.96				$231,056.84
Subject 41020 Total	8152.38				$538,727.17
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33		Contractor Cost (0.15)		$8,851.18
			Contingency (0.35)		$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	14.44	$399.85	$331.89	$425.63	$1,157.37
Ind. Labor & Material	4.77	$131.95	$0.00	$12.77	$144.72
State Sales Tax	0.00	$0.00	$12.45	$16.44	$28.89
QA/QC Impact	0.96	$26.59	$16.59	$21.92	$65.10
	20.17	$558.39	$360.93	$476.76	$1,396.08
Labor Contingency	7.06		Contractor Cost (0.15)		$208.03
			Contingency (0.35)		$561.96
Task 41045 Total	27.22				$2,167.42
Subject 41040 Total	27.22				$2,167.42
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	178.15	$5,297.10	$10,627.35	$3,152.07	$19,076.52
Ind. Labor & Material	58.13	$1,748.04	$0.00	$94.56	$1,842.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
State Sales Tax	0.00	$0.00	$398.53	$121.75	$520.28
QA/QC Impact	11.71	$352.26	$531.37	$162.33	$1,045.96
	245.99	$7,397.40	$11,557.25	$3,530.71	$22,485.36
Labor Contingency	73.80		Contractor Cost (0.15)		$3,372.80
			Contingency (0.30)		$7,757.46
Task 41060 Total	319.79				$33,615.62
Subject 41060 Total	319.79				$33,615.62
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	816.87	$22,619.67	$7,699.00	$10,780.23	$41,098.90
Ind. Labor & Material	268.57	$7,464.49	$0.00	$323.41	$7,787.90
State Sales Tax	0.00	$0.00	$288.71	$416.39	$705.10
QA/QC Impact	54.32	$1,504.21	$384.95	$555.18	$2,444.34
	1140.76	$31,588.37	$8,372.66	$12,075.21	$52,036.24
Labor Contingency	285.19		Contractor Cost (0.15)		$7,805.45
			Contingency (0.25)		$14,760.43
Task 41070 Total	1425.95				$74,802.12
Subject 41070 Total	1425.95				$74,802.12
Category 41000 Total	11076.04				$740,921.97
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	351.23	$11,509.10	$41,432.98	$34,833.64	$87,775.72
Ind. Labor & Material	116.00	$3,798.00	$0.00	$1,045.01	$4,843.01
State Sales Tax	0.00	$0.00	$1,553.73	$1,345.45	$2,899.18
QA/QC Impact	23.38	$765.36	$2,071.65	$1,793.93	$4,630.94
	490.91	$16,072.46	$45,058.36	$39,018.03	$100,148.85
Labor Contingency	171.82		Contractor Cost (0.15)		$15,022.33
			Contingency (0.35)		$40,309.91
Task 42010 Total	662.73				$155,481.09
Subject 42010 Total	662.73				$155,481.09
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	3.32	$108.85	$391.87	$329.45	$830.17
Ind. Labor & Material	1.10	$35.92	$0.00	$9.88	$45.80
State Sales Tax	0.00	$0.00	$14.69	$12.72	$27.41
QA/QC Impact	0.22	$7.24	$19.59	$16.97	$43.80
	4.64	$152.01	$426.15	$369.02	$947.18
Labor Contingency	1.63		Contractor Cost (0.15)		$142.08
			Contingency (0.35)		$381.23
Task 42030 Total	6.27				$1,470.49
Subject 42030 Total	6.27				$1,470.49
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.92	$95.60	$0.00	$0.00	$95.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	951.22				$220,896.50
Area 40000 Total	12027.27				$961,818.47
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	222.37	$6,157.78	$0.00	$41.33	$6,199.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.56
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3738.04	$119,978.13	$5,112.87	$7,577.93	$132,668.93
Ind. Labor & Material	1233.55	$39,592.78	$0.00	$227.34	$39,820.12
State Sales Tax	0.00	$0.00	$191.74	$292.70	$484.44
QA/QC Impact	248.58	$7,978.55	$255.65	$390.26	$8,624.46

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT (All costs in thousands of dollars)	MATERIALS	TOTAL
	5220.18	$167,549.46	$5,560.26	$8,488.23	$181,597.95
Labor Contingency	1566.05		Contractor Cost (0.15)		$27,239.70
			Contingency (0.30)		$62,651.29
Task 51031 Total	6786.23				$271,488.94
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$49.05	$130.94	$179.99
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.96
Labor Contingency	686.05		Contractor Cost (0.15)		$11,804.70
			Contingency (0.30)		$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	9759.13				$389,142.41
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.42	$32.75	$47.14
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
Labor Contingency	86.84		Contractor Cost (0.15)		$1,647.73
			Contingency (0.25)		$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	354.47	$9,815.47	$1,698.19	$3,541.67	$15,055.33
Ind. Labor & Material	116.98	$3,238.11	$0.00	$106.25	$3,345.36
State Sales Tax	0.00	$0.00	$63.69	$136.80	$200.49
QA/QC Impact	23.57	$652.73	$84.91	$182.40	$920.04
	495.02	$13,707.31	$1,846.79	$3,967.12	$19,521.22
Labor Contingency	148.51		Contractor Cost (0.15)		$2,928.18
			Contingency (0.30)		$6,734.83
Task 51050 Total	643.53				$29,184.23
Subject 51050 Total	643.53				$29,184.23
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	462.09	$12,795.20	$8,197.24	$3,468.97	$24,461.41
Ind. Labor & Material	152.46	$4,222.42	$0.00	$104.07	$4,326.49
State Sales Tax	0.00	$0.00	$307.40	$133.96	$441.36
QA/QC Impact	30.73	$850.88	$409.87	$178.65	$1,439.40
	645.30	$17,868.50	$8,914.51	$3,885.68	$30,668.69
Labor Contingency	193.59		Contractor Cost (0.15)		$4,600.30
			Contingency (0.30)		$10,580.70
Task 51060 Total	838.90				$45,849.69
Subject 51060 Total	838.90				$45,849.69
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$94.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
Labor Contingency	9.79		Contractor Cost (0.15)		$755.49
			Contingency (0.25)		$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
Labor Contingency	0.54		Contractor Cost (0.15)		$92.60
			Contingency (0.25)		$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
Labor Contingency	0.95		Contractor Cost (0.15)		$426.70
			Contingency (0.25)		$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47			Contractor Cost (0.15)	$3,063.79
				Contingency (0.30)	$7,046.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax	0.00	$0.00	$0.18	$26.84	$27.02
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73			Contractor Cost (0.15)	$2,075.07
				Contingency (0.25)	$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	14114.42				$586,299.80
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64			Contractor Cost (0.15)	$2,153.85
				Contingency (0.25)	$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.84	$2.72	$3.56
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46			Contractor Cost (0.15)	$159.64
				Contingency (0.30)	$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$32.13	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72			Contractor Cost (0.15)	$538.81
				Contingency (0.30)	$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.45	$0.00	$11.11	$141.56
State Sales Tax	0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact	0.95	$26.28	$1.97	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98			Contractor Cost (0.15)	$151.61
				Contingency (0.30)	$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.57	$10,365.32	$0.00	$543.04	$10,908.36
State Sales Tax	0.00	$0.00	$300.65	$699.16	$999.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37			Contractor Cost (0.15)	$10,928.80
				Contingency (0.35)	$25,525.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	16251.94				$728,526.14

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 29031.25 x 10^3 man-hrs $1,731,814.99

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$64.02	$1,614.60
State Sales Tax	0.00	$0.00	$21.68	$82.42	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.21	$39.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$39.83	$574.17
State Sales Tax	0.00	$0.00	$12.45	$51.29	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.45
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$242.93
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$3.05	$20.79	$23.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	472.16	$13,074.11	$4,133.91	$8,890.18	$26,098.20
Ind. Labor & Material	155.81	$4,314.46	$0.00	$266.71	$4,581.17
State Sales Tax	0.00	$0.00	$155.02	$343.38	$498.40
QA/QC Impact	31.40	$869.43	$206.69	$457.84	$1,533.96
	659.37	$18,258.00	$4,495.62	$9,958.11	$32,711.73
Labor Contingency	164.84		Contractor Cost (0.15)		$4,906.76
			Contingency (0.25)		$9,404.62
Task 41070 Total	824.21				$47,023.11
Subject 41070 Total	824.21				$47,023.11
Category 41000 Total	824.21				$47,023.11
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.53
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	847.89				$49,474.96
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.64	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$36.58	$57.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.72	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.84	$22.05
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.45
			Contingency (0.30)		$2,080.24
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency	10.17		Contractor Cost (0.15)		$176.84
			Contingency (0.25)		$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	128.47	$3,557.35	$1,293.04	$855.28	$5,705.67
Ind. Labor & Material	42.40	$1,173.93	$0.00	$25.66	$1,199.59
State Sales Tax	0.00	$0.00	$48.49	$33.04	$81.53
QA/QC Impact	8.54	$236.56	$64.65	$44.05	$345.26
	179.41	$4,967.84	$1,406.18	$958.03	$7,332.05
Labor Contingency	53.82		Contractor Cost (0.15)		$1,099.81
			Contingency (0.30)		$2,529.57
Task 51050 Total	233.23				$10,961.43
Subject 51050 Total	233.23				$10,961.43
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$37.53	$315.12
State Sales Tax	0.00	$0.00	$101.90	$45.75	$147.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency	10.60		Contractor Cost (0.15)		$818.45
			Contingency (0.25)		$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.99	$0.00	$0.17	$9.13
State Sales Tax	0.00	$0.00	$15.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency	0.29		Contractor Cost (0.15)		$62.26
			Contingency (0.25)		$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency	1.03		Contractor Cost (0.15)		$182.30
			Contingency (0.25)		$349.40
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.09	$2,319.59	$0.00	$51.70	$2,371.28
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency	88.99		Contractor Cost (0.15)		$1,956.04
			Contingency (0.30)		$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency	127.54		Contractor Cost (0.15)		$2,248.00
			Contingency (0.25)		$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2736.60				$116,511.01
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.06	$22.44	$136.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency	18.15		Contractor Cost (0.15)		$964.92
			Contingency (0.25)		$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	6.82	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,608.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.39	$0.00	$241.67	$5,259.06
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3849.25				$197,293.64

* TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT. 5251.31 x 10^3 man-hrs $278,157.30 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	112.61	$3,686.69	$283.48	$1,655.36	$5,625.53
Ind. Labor & Material	37.16	$1,216.61	$0.00	$49.66	$1,266.27
State Sales Tax	0.00	$0.00	$10.63	$63.94	$74.57
QA/QC Impact	7.49	$245.17	$14.17	$85.25	$344.59
	157.26	$5,148.47	$308.28	$1,854.21	$7,310.96
Labor Contingency	47.18			Contractor Cost (0.15)	$1,096.65
				Contingency (0.30)	$2,522.28
Task 23011 Total	204.43				$10,929.89
Subject 23010 Total	204.43				$10,929.89
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.57			Contractor Cost (0.15)	$15.38
				Contingency (0.30)	$35.39
Task 23085 Total	2.48				$153.34
Subject 23080 Total	2.48				$153.34
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.48			Contractor Cost (0.15)	$15.38
				Contingency (0.25)	$29.49
Task 23105 Total	2.39				$147.44
Subject 23100 Total	2.39				$147.44
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.23	$40.34	$6.48	$26.01	$72.83
Ind. Labor & Material	0.41	$13.31	$0.00	$0.78	$14.09
State Sales Tax	0.00	$0.00	$0.24	$1.00	$1.24
QA/QC Impact	0.08	$2.68	$0.32	$1.34	$4.34
	1.72	$56.33	$7.04	$29.13	$92.50
Labor Contingency	0.43			Contractor Cost (0.15)	$13.87
				Contingency (0.25)	$26.60
Task 23115 Total	2.15				$132.97
Subject 23110 Total	2.15				$132.97
Category 23000 Total	211.45				$11,363.64
Area 20000 Total	211.45				$11,363.64
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	17.20	$476.40	$97.67	$390.67	$964.74
Ind. Labor & Material	5.68	$157.21	$0.00	$11.76	$168.97
State Sales Tax	0.00	$0.00	$5.66	$13.09	$18.75
QA/QC Impact	1.14	$31.68	$4.88	$20.12	$56.68
	24.03	$665.29	$106.21	$437.60	$1,209.10
Labor Contingency	7.21			Contractor Cost (0.15)	$181.36
				Contingency (0.30)	$417.14
Task 30010 Total	31.23				$1,807.60
Subject 30010 Total	31.23				$1,807.60
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	9.31	$257.87	$52.88	$211.53	$522.28
Ind. Labor & Material	3.07	$85.10	$0.00	$6.32	$91.42
State Sales Tax	0.00	$0.00	$1.98	$8.17	$10.15
QA/QC Impact	0.62	$17.15	$2.64	$10.89	$30.68
	13.01	$360.12	$57.50	$236.94	$654.56
Labor Contingency	3.90			Contractor Cost (0.15)	$98.18
				Contingency (0.30)	$225.82
Task 30080 Total	16.91				$978.56
Subject 30080 Total	16.91				$978.56
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.65	$128.79	$26.40	$105.60	$260.79
Ind. Labor & Material	1.53	$42.50	$0.00	$3.17	$45.67
State Sales Tax	0.00	$0.00	$0.99	$4.08	$5.07
QA/QC Impact	0.31	$8.56	$1.32	$5.44	$15.32
	6.50	$179.85	$28.71	$118.29	$326.85
Labor Contingency	1.62			Contractor Cost (0.15)	$49.03
				Contingency (0.25)	$93.97
Task 30106 Total	8.12				$469.85
Subject 30100 Total	8.12				$469.85

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.20	$116.17	$23.81	$95.25	$235.23
Ind. Labor & Material	1.38	$38.34	$0.00	$2.86	$41.20
State Sales Tax	0.00	$0.00	$0.89	$3.68	$4.57
QA/QC Impact	0.28	$7.73	$1.19	$4.91	$13.83
	5.86	$162.24	$25.89	$106.70	$294.83
Labor Contingency	1.46		Contractor Cost (0.15)		$44.22
			Contingency (0.25)		$84.78
Task 30116 Total	7.32				$423.83
Subject 30110 Total	7.32				$423.83
Category 30000 Total	63.58				$3,679.84
Area 30000 Total	63.58				$3,679.84
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	183.87	$5,091.16	$2,591.04	$723.22	$8,405.42
Ind. Labor & Material	60.68	$1,680.08	$0.00	$21.70	$1,701.78
State Sales Tax	0.00	$0.00	$97.16	$27.93	$125.09
QA/QC Impact	12.23	$338.56	$129.55	$37.25	$505.36
	256.77	$7,109.80	$2,817.75	$810.10	$10,737.65
Labor Contingency	64.19		Contractor Cost (0.15)		$1,610.64
			Contingency (0.25)		$3,087.07
Task 41070 Total	320.97				$15,435.36
Subject 41070 Total	320.97				$15,435.36
Category 41000 Total	320.97				$15,435.36
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.29	$12.98	$27.27
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$6.83	$222.88
State Sales Tax	0.00	$0.00	$24.75	$8.79	$33.54
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33		Contractor Cost (0.15)		$11.20
			Contingency (0.40)		$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	721.70	$20,177.56	$17,882.98	$10,832.96	$48,893.50
Ind. Labor & Material	238.16	$6,658.59	$0.00	$424.99	$6,083.58
State Sales Tax	0.00	$0.00	$670.61	$418.42	$1,089.03
QA/QC Impact	47.99	$1,341.81	$894.15	$557.90	$2,793.86
	1007.85	$28,177.96	$19,447.74	$12,134.27	$59,759.97
Labor Contingency	403.14		Contractor Cost (0.15)		$8,964.00
			Contingency (0.40)		$27,489.59
Task 43300 Total	1411.00				$96,213.56
Subject 43300 Total	1411.00				$96,213.56
Category 43000 Total	1613.07				$107,190.38
Area 40000 Total	1934.04				$122,625.74
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	204.39	$5,660.07	$821.36	$420.06	$6,901.49
Ind. Labor & Material	67.45	$1,867.82	$0.00	$12.60	$1,880.42
State Sales Tax	0.00	$0.00	$30.80	$16.22	$47.02
QA/QC Impact	13.59	$376.39	$41.07	$21.63	$439.09
	285.44	$7,904.28	$893.23	$470.51	$9,268.02
Labor Contingency	71.36		Contractor Cost (0.15)		$1,390.19
			Contingency (0.25)		$2,664.56
Task 51011 Total	356.79				$13,322.77
Subject 51010 Total	356.79				$13,322.77
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	330.34	$10,589.31	$899.65	$730.77	$12,219.73
Ind. Labor & Material	109.01	$3,494.47	$0.00	$21.92	$3,516.39
State Sales Tax	0.00	$0.00	$33.74	$28.23	$61.97
QA/QC Impact	21.97	$704.19	$44.99	$37.63	$786.81
	461.31	$14,787.97	$978.38	$818.55	$16,584.90
Labor Contingency	138.39		Contractor Cost (0.15)		$2,487.74
			Contingency (0.30)		$5,721.80
Task 51031 Total	599.71				$24,794.44
Subject 51030 Total	599.71				$24,794.44
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	103.53	$2,866.66	$172.42	$381.74	$3,420.82
Ind. Labor & Material	34.16	$946.00	$0.00	$11.45	$957.45
State Sales Tax	0.00	$0.00	$6.46	$14.74	$21.20
QA/QC Impact	6.88	$190.63	$8.62	$19.66	$218.91
	144.58	$4,003.29	$187.50	$427.59	$4,618.38
Labor Contingency	36.14		Contractor Cost (0.15)		$692.76
			Contingency (0.25)		$1,327.78
Task 51040 Total	180.72				$6,638.92
Subject 51040 Total	180.72				$6,638.92
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	168.68	$4,670.82	$4,698.29	$3,970.12	$13,339.23
Ind. Labor & Material	55.67	$1,541.37	$0.00	$119.10	$1,660.47
State Sales Tax	0.00	$0.00	$176.19	$153.35	$329.54
QA/QC Impact	11.22	$310.61	$234.92	$204.46	$749.99
	235.57	$6,522.80	$5,109.40	$4,447.03	$16,079.23
Labor Contingency	70.67		Contractor Cost (0.15)		$2,411.88
			Contingency (0.30)		$5,547.33
Task 51050 Total	306.24				$24,038.44
Subject 51050 Total	306.24				$24,038.44
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	11.91	$330.01	$1,065.97	$464.63	$1,860.61
Ind. Labor & Material	3.93	$108.90	$0.00	$13.94	$122.84
State Sales Tax	0.00	$0.00	$39.97	$17.95	$57.92
QA/QC Impact	0.79	$21.95	$53.30	$23.93	$99.18
	16.64	$460.86	$1,159.24	$520.45	$2,140.55
Labor Contingency	4.16		Contractor Cost (0.15)		$321.09
			Contingency (0.25)		$615.42
Task 51070 Total	20.80				$3,077.06
Subject 51070 Total	20.80				$3,077.06
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.65	$21.37	$210.00	$3.71	$235.08
Ind. Labor & Material	0.22	$7.05	$0.00	$0.11	$7.16
State Sales Tax	0.00	$0.00	$7.87	$0.14	$8.01
QA/QC Impact	0.04	$1.42	$10.50	$0.19	$12.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.91	$29.84	$228.37	$4.15	$262.36
Labor Contingency	0.23		Contractor Cost (0.15)		$39.35
			Contingency (0.25)		$75.42
Task 51080 Total	1.14				$377.13
Subject 51080 Total	1.14				$377.13
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.58	$19.79	$930.09	$115.54	$1,065.42
Ind. Labor & Material	0.19	$6.53	$0.00	$3.47	$10.00
State Sales Tax	0.00	$0.00	$34.88	$4.46	$39.34
QA/QC Impact	0.04	$1.32	$46.51	$5.95	$53.78
	0.81	$27.64	$1,011.48	$129.42	$1,168.54
Labor Contingency	0.20		Contractor Cost (0.15)		$175.28
			Contingency (0.25)		$335.96
Task 51090 Total	1.01				$1,679.78
Subject 51090 Total	1.01				$1,679.78
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	133.46	$4,384.31	$799.33	$815.40	$5,999.04
Ind. Labor & Material	44.04	$1,446.82	$0.00	$24.46	$1,471.28
State Sales Tax	0.00	$0.00	$29.97	$31.49	$61.46
QA/QC Impact	8.88	$291.56	$39.97	$41.99	$373.52
	186.38	$6,122.69	$869.27	$913.34	$7,905.30
Labor Contingency	55.91		Contractor Cost (0.15)		$1,185.80
			Contingency (0.30)		$2,727.33
Task 51100 Total	242.30				$11,818.43
Subject 51100 Total	242.30				$11,818.43
Category 51000 Total	1708.70				$85,746.97
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	42.00	$1,430.94	$5,781.23	$300.18	$7,512.35
Ind. Labor & Material	13.86	$472.21	$0.00	$9.01	$481.22
State Sales Tax	0.00	$0.00	$216.80	$11.59	$228.46
QA/QC Impact	2.79	$95.16	$289.06	$15.46	$399.68
	58.65	$1,998.31	$6,287.09	$336.24	$8,621.64
Labor Contingency	14.66		Contractor Cost (0.15)		$1,293.24
			Contingency (0.25)		$2,478.72
Task 52010 Total	73.32				$12,393.60
Subject 52010 Total	73.32				$12,393.60
52020 Communications					
52020 Communications					
Direct Cost	6.01	$204.69	$2.90	$18.62	$226.21
Ind. Labor & Material	1.98	$67.55	$0.00	$0.56	$68.11
State Sales Tax	0.00	$0.00	$0.11	$0.72	$0.83
QA/QC Impact	0.40	$13.61	$0.14	$0.96	$14.71
	8.39	$285.85	$3.15	$20.86	$309.86
Labor Contingency	2.52		Contractor Cost (0.15)		$46.48
			Contingency (0.30)		$106.91
Task 52020 Total	10.91				$463.25
Subject 52020 Total	10.91				$463.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	139.02	$3,849.25	$17,414.69	$6,996.59	$28,260.53
Ind. Labor & Material	45.88	$1,270.25	$0.00	$209.90	$1,480.15
State Sales Tax	0.00	$0.00	$653.05	$270.27	$923.32
QA/QC Impact	9.24	$255.98	$870.74	$360.32	$1,487.04
	194.14	$5,375.48	$18,938.48	$7,837.05	$32,151.01
Labor Contingency	58.24		Contractor Cost (0.15)		$4,822.65
			Contingency (0.30)		$11,092.09
Task 52040 Total	252.38				$48,065.75
Subject 52040 Total	252.38				$48,065.75
Category 52000 Total	336.60				$60,922.60
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	146.25	$4,744.26	$1,398.25	$3,160.30	$9,302.81
Ind. Labor & Material	48.26	$1,565.61	$0.00	$94.81	$1,660.42
State Sales Tax	0.00	$0.00	$52.44	$122.07	$174.51
QA/QC Impact	9.73	$315.49	$69.92	$162.76	$548.17
	204.24	$6,625.36	$1,520.61	$3,539.94	$11,685.91
Labor Contingency	71.48		Contractor Cost (0.15)		$1,752.89
			Contingency (0.35)		$4,703.58
Task 53000 Total	275.72				$18,142.38
Subject 53000 Total	275.72				$18,142.38
Category 53000 Total	275.72				$18,142.38
Area 50000 Total	2321.03				$164,811.95

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 4530.10 x 10^3 man-hrs $302,481.17 *

Case 7

Contents

Summary Cost Matrix (Table 1)

Surface Facility Capital Costs

Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

Underground Facilities, Project Phase 1 (Capital Costs - Engineering and Construction)

Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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TABLE 1, MRS SYSTEMS STUDY - CASE 7 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMIS-SIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$249.96	$27.19	$26.52	$53.71	$16.57	$6.87	$23.43	$327.10
	1000	SUPPORT CONTRACTOR	$38.25	$0.00	$0.00	$0.00	$3.31	$0.90	$4.21	$42.46
	1010	Surface	$22.32			$0.00		$0.90	$0.90	
	1020	Subsurface	$15.93			$0.00	$3.31		$3.31	
	2000	ARCHITECT-ENGINEER	$152.99	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26	$3.58	$16.84	$169.83
	2010	Surface	$89.28	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$63.71	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$13.26		$13.26	
	3000	CONSTRUCTION MANAGEMENT	$57.71	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$60.10
	3010	Surface	$34.51	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$23.20			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.19	$0.52	$3.71			$0.00	$3.71
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$89.54	$16.17	$105.71	$1.51	$39.85	$41.36	$325.08
	11000	EMPLOYEE TRANSPORTATION		$81.65	$13.83	$95.48	$1.20		$1.20	$96.68
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$335.11	$1,547.93	$215.21	$1,763.15	$43.73	$20.46	$64.19	$2,162.45
4.3.2.1	21000	WASTE HANDLING FACILITY	$199.21	$556.61	$29.36	$585.97	XXXXXXXXXX	$13.30	$13.30	$798.48
	21100	Waste Handling Building 1:	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	$0.00	
4.3.2.1.2	21102	Building/Structures	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$0.00			$0.00	XXXXXXXXXX		$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 7 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$153.89	$0.00	$0.00	$0.00	XXXXXXXXXXX	$9.10	$9.10	
4.3.2.1.9	21202	Building/Structures	$69.89			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$20.55			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$10.83			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$7.66			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$40.56			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$4.40			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$45.32	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.20	$4.20	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.02			$0.00	XXXXXXXXXXX	$1.69	$1.69	
	21502	Vehicle Wash Facility	$0.79			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.43			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$88.48	$964.55	$170.38	$1,134.94	$32.37	$4.45	$36.82	$1,260.24
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.02		$19.02	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.49			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$10.53			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$11.36	$2.71	$14.07	$103.74
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$10.93	$0.67	$11.60	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04	$10.93		$10.93	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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05-Jan-89 REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 7 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.15	$2.04	$2.19	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.15		$0.15	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.15	$0.00	$0.15	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.15		$0.15	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.13		$0.13	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.68	XXXXXXXXXXXX	$3.68	$99.87
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.81	XXXXXXXXXXXX	$1.81	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.98	XXXXXXXXXXXX	$0.98	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXXX	$0.47	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.47	XXXXXXXXXXXX	$0.47	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXXX	$0.42	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.42	XXXXXXXXXXXX	$0.42	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$151.22	$961.82	$49.47	$1,011.29	$122.63	XXXXXXXXXXXX	$122.63	$1,285.14
4.3.4.1	41000	DEVELOPMENT	$130.46	$740.92	$47.02	$787.95	$15.44	XXXXXXXXXXXX	$15.44	$933.84
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$84.55	$538.73	XXXXXXXXXXX	$538.73	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXX	$14.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXX	$47.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXX	$22.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41024	Emplacement Drifts	$28.31	$223.24	XXXXXXXXXXX	$223.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$22.62	$231.06	XXXXXXXXXXX	$231.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$2.85	$2.17	XXXXXXXXXXX	$2.17	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41060	Excavated Material Handling	$13.02	$33.62	$0.00	$33.62	$0.00	XXXXXXXXXXX	$0.00	
	41070	General Maintenance	$9.20	$74.80	$47.02	$121.83	$15.44	XXXXXXXXXXX	$15.44	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.76	$220.90	$2.45	$223.35	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$244.11
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$155.48	$0.00	$155.48	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.93	$1.47	$0.00	$1.47	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	

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05-Jan-89 REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 7 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$107.19	XXXXXXXXXXXX	$107.19	$107.19
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$4.98	XXXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$3.04	XXXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.69	XXXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.59	XXXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.56	XXXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.12	XXXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$96.21	XXXXXXXXXXXX	$96.21	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$105.26	$728.53	$197.29	$925.82	$164.81	XXXXXXXXXXXX	$164.81	$1,195.90
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$82.55	$586.30	$116.51	$702.81	$85.75	XXXXXXXXXXXX	$85.75	$871.11
4.3.5.1.1	51010	Material Support, Receiving/Warehousing	$12.96	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXXX	$13.32	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$13.32	XXXXXXXXXXXX	$13.32	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$43.12	$389.14	$33.44	$422.58	$24.79	XXXXXXXXXXXX	$24.79	
	51031	Development Area	$42.12	$271.49	$24.42	$295.91	$24.79	XXXXXXXXXXXX	$24.79	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$6.64	XXXXXXXXXXXX	$6.64	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.23	$29.18	$10.96	$40.15	$24.04	XXXXXXXXXXXX	$24.04	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$8.77	$45.85	$0.00	$45.85	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.7'	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$3.08	XXXXXXXXXXXX	$3.08	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.38	XXXXXXXXXXXX	$0.38	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.68	XXXXXXXXXXXX	$1.68	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$11.82	XXXXXXXXXXXX	$11.82	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$60.92	$0.00	$60.92	$124.20
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$12.39	XXXXXXXXXXXX	$12.39	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.46	XXXXXXXXXXXX	$0.46	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$48.07	XXXXXXXXXXXX	$48.07	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$18.14	XXXXXXXXXXXX	$18.14	$200.59
		TOTAL REPOSITORY	$1,085.14	$3,369.70	$520.60	$3,890.30	$352.93	$67.17	$420.10	$5,395.54
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$31.12
	61000	SPENT FUEL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$0.00
	61010	Intact PWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$0.00
	63000	OTHER WASTE	XXXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$31.12
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXXX	$16.00		$16.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	99999	TOTAL REPOSITORY, with EMPLACEMENT CONTAINERS	$1,085.14	$3,392.09	$529.33	$3,921.42	$352.93	$67.17	$420.10	$5,426.66

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 7
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.4	2,383.5	0.0	3,020.9	637.4	89.4 25%	936.9	4,684.6	320.1	5,004.7 10%	365.8	18.3	96.0	480.1	5,484.8
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9 25%	588.1	2,940.6	200.6	3,141.2 10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0 25%	79.4	396.8	27.2	424.0 10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.2	0.0	0.0	822.2	822.2	0.0 20%	328.9	1,973.3	138.1	2,111.4 5%	82.2	4.1	17.3	103.6	2,215.0
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0 20%	696.1	4,176.5	292.4	4,468.9 5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3 20%	36.5	218.8	15.2	234.0 5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0 20%	143.5	860.9	60.3	921.2 5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.8	448.4	0.0	697.2	248.8	16.8 20%	192.6	1,155.4	79.5	1,234.9 5%	47.3	2.4	9.9	59.6	1,294.5
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,328.0	9,219.9	2,076.1	267.9 30%	3,469.2	15,033.1	1,027.9	16,061.0 15%	1,694.4	84.7	533.7	2,312.8	18,373.8
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.5	0.0	42.0	16.5	1.0 20%	11.9	71.4	4.9	76.3 5%	2.9	0.1	0.6	3.6	79.9
		SUBTOTAL 120 - ON SITE	222.4	$6,383.5	$6,316.4	$5,501.6	$18,201.5	$6,383.5	$443.3	$6,483.1	$31,511.4	$2,166.2	$33,677.6	$2,671.9	$133.7	$771.8	$3,577.4	$37,255.0
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1 25%	2,294.6	11,473.0	784.7	12,257.7 10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8 30%	1,598.4	6,926.5	477.0	7,403.5 15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.6	68,508.6	0.0	82,398.2	13,889.6	2,569.1 25%	24,714.2	123,571.1	8,425.2	131,996.3 10%	9,628.8	481.4	2,527.6	12,637.8	144,634.1
	130.50	OFF SITE - UTILITIES	39.1	1,133.5	949.4	224.7	2,307.6	1,133.5	44.0 30%	1,045.5	4,530.6	313.1	4,843.7 15%	516.2	25.8	162.6	704.6	5,548.3
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0 25%	6,961.1	34,805.6	2,386.7	37,192.3 10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.6	$24,233.6	$92,517.8	$230.0	$116,981.4	$24,233.6	$3,478.0	$36,613.8	$181,306.8	$12,386.7	$193,693.5	$14,555.7	$727.7	$3,889.3	$19,172.7	$212,866.2
4.3.1		TOTAL 100 - SITE	1,058.0	$30,617.1	$98,834.2	$5,731.6	$135,182.9	$30,617.1	$3,921.3	$43,096.9	$212,818.2	$14,552.9	227,371.1	$17,227.6	$861.4	$4,661.1	$22,750.1	$250,121.2
	211.02	WHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.03	WHB I - HOT CELL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.04	WHB I - UTILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.05	WHB I - HVAC EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.06	WHB I - HANDL/PACK EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.07	WHB I - SUPPORT FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
		SUBTOTAL 211 - WHB I	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	WHB II - BUILDING/STRUCT	588.4	17,064.9	14,224.9	997.0	32,286.8	17,064.9	570.8 40%	19,969.0	69,891.5	4,836.5	74,728.0 25%	12,337.9	616.9	5,181.9	18,136.7	92,864.7
	212.03	WHB II - HOT CELL EQUIP	72.3	2,097.7	0.0	10,104.1	12,201.8	2,097.7	378.9 40%	5,871.4	20,549.8	1,401.4	21,951.2 25%	3,574.9	178.7	1,501.4	5,255.0	27,206.2
	212.04	WHB II - UTILITIES	94.8	2,613.9	972.7	1,443.4	5,030.0	2,613.9	90.6 40%	3,093.8	10,828.3	749.1	11,577.4 25%	1,911.0	95.6	802.6	2,809.2	14,386.6
	212.05	WHB II - HVAC EQUIPMENT	43.3	1,255.7	1,357.4	1,493.6	4,106.7	1,255.7	106.9 40%	2,187.7	7,657.0	525.5	8,182.5 25%	1,340.6	67.0	563.0	1,970.6	10,153.1
	212.06	WHB II - HANDL/PACK EQUIP	145.0	4,204.1	0.0	19,817.6	24,021.7	4,204.1	743.2 40%	11,587.6	40,556.6	2,766.1	43,322.7 25%	7,056.5	352.8	2,963.7	10,373.0	53,695.7
	212.07	WHB II - SUPPORT FAC.	7.6	221.3	0.0	2,599.9	2,821.2	221.3	97.5 40%	1,256.0	4,396.0	298.2	4,694.2 25%	760.6	38.0	319.4	1,118.0	5,812.2
		SUBTOTAL 212 - WHB II	951.4	$27,457.6	$16,555.0	$36,455.6	$80,468.2	$27,457.6	$1,987.9	$43,965.5	$153,879.2	$10,576.8	$164,456.0	$26,981.5	$1,349.0	$11,332.0	$39,662.5	$204,118.5
	215.01	WASTE TREATMENT BUILDING	115.6	3,351.5	2,717.5	4,605.3	10,674.3	3,351.5	274.6 40%	5,720.2	20,020.6	1,374.5	21,395.1 25%	3,506.5	175.3	1,472.7	5,154.5	26,549.6
	215.02	VEHICLE WASH FACILITY	4.7	135.3	171.7	152.0	459.0	135.3	12.1 30%	181.9	788.3	54.1	842.4 15%	89.1	4.5	28.1	121.7	964.1
	215.03	DECONTAMINATION BUILDING	20.0	579.1	906.5	516.5	2,002.1	579.1	53.4 30%	790.4	3,425.0	234.9	3,659.9 15%	387.2	19.4	122.0	528.6	4,188.5
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.5	10,756.8	4,045.2	251.7 40%	6,021.5	21,075.2	1,450.6	22,525.8 25%	3,700.5	185.0	1,554.2	5,439.7	27,965.5
		SUBTOTAL 215 - OTHER	279.9	$8,111.1	$7,360.8	$8,420.3	$23,892.2	$8,111.1	$591.8	$12,714.0	$45,309.1	$3,114.1	$48,423.2	$7,683.3	$384.2	$3,177.0	$11,244.5	$59,667.7
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	1,231.3	$35,568.7	$23,915.8	$44,875.9	$104,360.4	$35,568.7	$2,579.7	$56,679.5	$199,188.3	$13,690.9	$212,879.2	$34,664.8	$1,733.2	$14,509.0	$50,907.0	$263,786.2

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 7
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.0	889.0	1,875.2	509.2	51.2 25%	608.9	3,044.5	208.6	3,253.1 10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2 25%	303.3	1,516.4	104.6	1,621.0 10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.7	568.0	803.2	1,985.9	614.7	51.4 30%	795.6	3,447.6	236.7	3,684.3 15%	390.1	19.5	122.9	532.5	4,216.8
	220.40	MAINTENANCE FACILITIES	49.4	1,433.2	1,828.3	415.4	3,676.9	1,433.2	84.1 25%	1,298.6	6,492.8	447.1	6,939.9 10%	511.0	25.6	134.2	670.8	7,610.7
	220.50	ADMIN/PERSONNEL FACILITIES	89.1	2,582.9	2,290.6	536.3	5,409.8	2,582.9	106.0 30%	2,429.6	10,528.3	727.3	11,255.6 15%	1,198.9	59.9	377.6	1,636.4	12,892.0
	220.60	MOCK-UP BUILDING	20.7	595.9	957.0	501.2	2,054.1	595.9	54.7 30%	811.4	3,516.1	241.1	3,757.2 15%	397.5	19.9	125.2	542.6	4,299.8
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.1	4,477.5	375.5	7,327.1	2,474.1	182.0 25%	2,495.8	12,479.0	857.6	13,336.6 10%	980.1	49.0	257.3	1,286.4	14,623.0
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1 25%	150.7	753.4	51.9	805.3 10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.7	222.1	3,348.0	4,009.8	439.7	133.9 30%	1,375.0	5,958.4	404.9	6,363.3 15%	667.4	33.4	210.2	911.0	7,274.3
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5 30%	451.6	1,957.0	135.1	2,092.1 15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.5	61.1	37.2	0.9 25%	24.8	124.0	8.6	132.6 10%	9.8	0.5	2.6	12.9	145.5
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6 25%	195.5	977.4	66.3	1,043.7 10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.6	2,925.2	4,046.7	1,078.9	111.3 25%	1,309.2	6,546.1	448.5	6,994.6 10%	512.6	25.6	134.6	672.8	7,667.4
	221.90	SEWAGE FACILITY	15.1	439.0	419.3	8.4	866.7	439.0	16.0 25%	330.4	1,652.1	114.2	1,766.3 10%	130.6	6.5	34.3	171.4	1,937.7
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1 30%	4,683.5	20,295.2	1,374.8	21,670.0 15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.8	0.0	5,186.5	5,210.3	23.8	194.5 25%	1,357.2	6,785.8	458.0	7,243.8 10%	523.4	26.2	137.4	687.0	7,930.8
	222.42	BATCH PLANT	10.2	296.2	0.6	1,273.0	1,569.8	296.2	47.8 25%	478.5	2,392.3	163.3	2,555.6 10%	186.6	9.3	49.0	244.9	2,800.5
4.3.2.2		TOTAL 220 - BALANCE OF PLANT	427.9	$12,406.0	$12,585.1	$30,359.4	$55,350.5	$12,406.0	$1,610.3	$19,099.6	$88,466.4	$6,048.6	$94,515.0	$8,489.8	$424.5	$2,498.7	$11,413.0	$105,928.0
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.7	159.0	35.7	348.4	153.7	7.3 30%	152.8	662.2	45.7	707.9 15%	75.3	3.8	23.7	102.8	810.7
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1221.7	1,857.2	503.3	3,582.2	1,221.7	88.5 35%	1,712.3	6,604.7	454.0	7,058.7 20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.6	6,572.5	6,041.0	17,455.1	4,841.6	473.0 35%	7,969.4	30,739.1	2,107.0	32,846.1 20%	4,459.3	223.0	1,638.8	6,321.1	39,167.2
		TOTAL 230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8	$9,834.5	$38,006.0	$2,606.7	$40,612.7	$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0		GRAND TOTAL SURFACE FACILITIES	2,931.6	$84,808.8	$143,923.8	$87,546.9	$316,279.5	$84,808.8	$8,680.1	$128,710.5	$538,478.9	$36,899.1	$575,378.0	$65,877.6	$3,293.9	$23,684.4	$92,855.9	$668,233.9

DATE : 08-Nov-88

JOB 16039 - TUFF REPOSITORY- OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 7
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	4	7	9	12	14	15	15	15	
BUSES AT $100.0 K per YEAR	COST	$200	$400	$700	$900	$1,200	$1,400	$1,500	$30,000	$1,500	$37,800
	SUBTOTAL - 100	$226	$426	$726	$1,160	$1,460	$1,660	$1,760	$35,200	$1,760	$44,378
CONTINGENCY @ 20%		$45	$85	$145	$232	$292	$332	$352	$7,040	$352	$8,876
	TOTAL - 100	$271	$511	$871	$1,392	$1,752	$1,992	$2,112	$42,240	$2,112	$53,254
210 - WASTE HANDLING FACILITIES											
LABOR:	# of PEOPLE	12	33	54	76	98	119	126	126	126	
COST PER YR/ PERSON $52,700	COST	$632	$1,739	$2,846	$4,005	$5,165	$6,271	$6,640	$132,804	$6,640	$166,743
OPERATING SUPPLIES @ 5.0% of LABOR		$32	$87	$142	$200	$258	$314	$332	$6,640	$332	$8,337
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$1,320	$1,320	$1,320	$7,920	$7,920	$7,920	$7,920	$158,400	$7,920	$201,960
Capital Cost = 264 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$1,352	$1,407	$1,462	$8,120	$8,178	$8,234	$8,252	$165,040	$8,252	$210,297
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	1	1	1	10	10	10	10	10	10	
@ $.05/Kwhr	COST	$50	$50	$50	$500	$500	$500	$500	$10,000	$500	$12,650
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$51	$53	$55	$305	$307	$309	$309	$6,189	$309	$7,886
	SUBTOTAL - 210	$2,085	$3,249	$4,413	$12,930	$14,150	$15,314	$15,702	$314,033	$15,702	$397,576
CONTINGENCY @ 40%		$834	$1,300	$1,765	$5,172	$5,660	$6,125	$6,281	$125,613	$6,281	$159,030
	TOTAL - 210	$2,919	$4,548	$6,178	$18,102	$19,809	$21,439	$21,982	$439,646	$21,982	$556,607
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	43	115	187	256	346	416	452	452	452	
COST PER YR/ PERSON $52,700	COST	$2,266	$6,061	$9,855	$13,491	$18,234	$21,923	$23,820	$476,408	$23,820	$595,879
OPERATING SUPPLIES @ 5.0% of LABOR		$113	$303	$493	$675	$912	$1,096	$1,191	$23,820	$1,191	$29,794
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$770	$770	$770	$3,080	$3,080	$3,080	$3,080	$61,600	$3,080	$79,310
Capital Cost = 154 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$883	$1,073	$1,263	$3,755	$3,992	$4,176	$4,271	$85,420	$4,271	$109,104
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.6	2.6	2.6	26	26	26	26	26	26	
@ $.05/Kwhr	COST	$130	$130	$130	$1,300	$1,300	$1,300	$1,300	$26,000	$1,300	$32,890
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$33	$40	$47	$141	$150	$157	$160	$3,203	$160	$4,091
	SUBTOTAL - 220	$3,313	$7,304	$11,295	$18,687	$23,676	$27,556	$29,552	$591,032	$29,552	$741,964
CONTINGENCY @ 30%		$994	$2,191	$3,388	$5,606	$7,103	$8,267	$8,865	$177,309	$8,865	$222,589
	TOTAL - 220	$4,306	$9,495	$14,683	$24,293	$30,778	$35,823	$38,417	$768,341	$38,417	$964,554
TOTAL ANNUAL O & M COST		$7,496	$14,554	$21,733	$43,786	$52,340	$59,254	$62,511	$1,250,228	$62,511	$1,574,414

DATE : 08-Nov-88

JOB 16079 - TUFF REPOSITORY- OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 7
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	9	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$900	$4,600	$100	$5,600	$1,000	$44,400
	SUBTOTAL - 100	$978	$6,394	$178	$7,550	$1,260	$53,188
CONTINGENCY @ 20%		$196	$1,279	$36	$1,510	$252	$10,638
	TOTAL - 100	$1,174	$7,673	$214	$9,060	$1,512	$63,826
210 - WASTE HANDLING FACILITIES							
LABOR:	# of PEOPLE	75	12	6		0	
COST PER YR/ PERSON $52,700	COST	$3,953	$14,545	$316	$18,814	$0	$185,557
OPERATING SUPPLIES @ 5.0% of LABOR		$198	$727	$16	$941	$0	$9,278
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$26	$607	$26	$660	$0	$202,620
Capital Cost = 264 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$224	$1,334	$42	$1,601	$0	$211,898
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$13,150
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$8	$50	$2	$60	$0	$7,946
	SUBTOTAL - 210	$4,205	$16,390	$380	$20,975	$0	$418,551
CONTINGENCY @ 40%		$1,682	$6,556	$152	$8,390	$0	$167,420
	TOTAL - 210	$5,887	$22,946	$532	$29,364	$0	$585,971
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	252	64	32		19	
COST PER YR/ PERSON $52,700	COST	$13,280	$77,574	$1,686	$92,541	$10,013	$698,433
OPERATING SUPPLIES @ 5.0% of LABOR		$664	$3,879	$84	$4,627	$501	$34,922
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$770	$17,710	$770	$19,250	$1,540	$100,100
Capital Cost = 154 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,434	$21,589	$854	$23,877	$2,041	$135,022
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$49,140
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$54	$810	$32	$895	$77	$5,063
	SUBTOTAL - 220	$15,318	$112,623	$3,123	$131,064	$14,630	$887,658
CONTINGENCY @ 30%		$4,595	$33,787	$937	$39,319	$4,389	$266,297
	TOTAL - 220	$19,914	$146,410	$4,060	$170,383	$19,019	$1,153,955
TOTAL ANNUAL O & M COST		$26,974	$177,028	$4,805	$208,807	$20,531	$1,803,752

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 7
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST		INDIRECT COST @ %	SUBTOTAL		CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10%	82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE													
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10%	1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10%	245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE													
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.4	75%	100.4	505.8	35%	177.0	10%	68.3	0.0	(0.1)	751.0
	120.70	ON SITE - DRAINAGE CONTROL		0.0													
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10%	9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10%	48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10%	1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9		$457.9	$0.0	$0.9	$5,037.0
	130.11	OFF SITE - ROADS (NEW)															
	130.13	OFF SITE - BRIDGES															
	130.21	OFF SITE - RAIL (NEW)															
	130.50	OFF SITE - UTILITIES															
	140.00	MONUMENTS															
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
4.3.1	TOTAL 100 - SITE		60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9		$457.9	$0.0	$0.9	$5,037.0
	211.02	MHB I - BUILDING/STRUCTURES															
	211.03	MHB I - HOT CELL EQUIPMENT															
	211.04	MHB I - UTILITIES															
	211.05	MHB I - HVAC EQUIPMENT															
	211.06	MHB I - HANDL/PACK EQUIP															
	211.07	MHB I - SUPPORT FACILITIES															
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	119.5	3,122.5	19.6	85.0	3,227.1	75%	2,341.9	5,569.0	35%	1,949.2	10%	751.8	827.0		9,097.0
	212.03	MHB II - HOT CELL EQUIP		INCLUDED ABOVE													
	212.04	MHB II - UTILITIES		INCLUDED ABOVE													
	212.05	MHB II - HVAC EQUIPMENT		INCLUDED ABOVE													
	212.06	MHB II - HANDL/PACK EQUIP		INCLUDED ABOVE													
	212.07	MHB II - SUPPORT FAC.		INCLUDED ABOVE													
		SUBTOTAL 212 - MHB II	119.5	$3,122.5	$19.6	$85.0	$3,227.1		$2,341.9	$5,569.0		$1,949.2		$751.8	$827.0	$0.0	$9,097.0
	215.01	WASTE TREATMENT BUILDING	18.2	479.8	10.0	187.1	676.9	75%	359.9	1,036.8	35%	362.9	10%	140.0	154.0	0.3	1,694.0
	215.02	VEHICLE WASH FACILITY	0.9	23.7	0.0	0.0	23.7	75%	17.8	41.5	35%	14.5	10%	5.6	6.2	0.2	68.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10%	21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10%	179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	44.1	$1,162.6	$20.7	$512.1	$1,695.4		$872.0	$2,567.4		$898.6		$346.7	$381.3	$0.1	$4,194.1
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		163.6	$4,285.1	$40.3	$597.1	$4,922.5		$3,213.9	$8,136.4		$2,847.8		$1,098.5	$1,208.3	$0.1	$13,291.1

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 7
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10% 15.6	17.1	0.6	189.0
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10% 12.5	13.7	0.3	151.0
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10% 19.9	21.9	(0.2)	241.0
	220.40	MAINTENANCE FACILITIES	8.1	213.5	0.0	0.0	213.5	75%	160.2	373.7	35%	130.8	10% 50.5	55.5	(0.5)	610.0
	220.50	ADMIN/PERSONNEL FACILITIES	12.6	332.2	0.0	0.0	332.2	75%	249.1	581.3	35%	203.4	10% 78.5	86.3	0.5	950.0
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10% 25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10% 49.8	54.8	0.1	603.0
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10% 6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10% 13.1	14.4	(0.3)	158.0
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10% 17.4	19.2		211.0
	221.10	EXPLOSIVE MAGAZINES	0.2	5.3	0.0	0.0	5.3	75%	4.0	9.3	35%	3.2	10% 1.2	1.4	(0.1)	15.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10% 2.1	2.3	0.3	26.0
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10% 23.7	26.0	(0.3)	286.0
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10% 12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10% 28.7	31.5	0.2	347.0
	222.30	STANDARD EQUIPMENT		0.0												
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10% 10.2	11.3		124.0
4.3.2.2	TOTAL	220 - BALANCE OF PLANT	58.7	$1,547.5	$0.0	$0.0	$1,547.5		$1,176.7	$2,724.2		$953.4	$367.7	$404.5	$1.0	$4,450.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10% 7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10% 48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10% 168.2	185.0	0.3	2,035.2
	TOTAL	230 - SURFACE SHAFT FAC.	35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8	$223.7	$246.0	$0.2	$2,706.1
4.0	GRAND	TOTAL SURFACE FACILITIES	319.1	$8,386.8	$311.9	$597.1	$9,295.8		$6,612.6	$15,908.4		$5,567.9	$2,147.8	$1,858.8	$2.2	$25,485.1

03-Nov-88

MRS SYSTEM STUDY - CASE 7
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
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WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTEN-TION ($1000s)	CONTIN-GENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	0	$0	$0	INCLUDED	$0
DHLW	DHLW	0	$0	$0	INCLUDED	$0
INTACT PWR		0	$0	$0	INCLUDED	$0
INTACT PWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED PWR		0	$0	$0	INCLUDED	$0
INTACT BWR and/or PWR/BWR MIXED		0	$0	$0	INCLUDED	$0
INTACT BWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED BWR		0	$0	$0	INCLUDED	$0
PWR HARDWARE		0	$0	$0	INCLUDED	$0
BWR HARDWARE		0	$0	$0	INCLUDED	$0
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		228		$6,384	$0	$6,384
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		540		$15,120	$0	$15,120
CONTACT HANDLED WASTE						$16,000
						$31,120

UNDERGROUND FACILITIES - CASE 7

MRS STUDY CASES 2,4,6, AND 7
MANAGEMENT AND INTEGRATION COST ESTIMATE
task:2605A138
FILE = ENG-2467.WK1 (RANGE=MGTINT)
06-Oct-88 02:53 PM

All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$38,682			
		EMPLACEMENT		$21,834			
		CARETAKER		$3,197			
		CLOSURE					$13,255
				$63,713	$0	$0	$13,255
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$15,928	$0	$0	$3,314
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $331,481 =====>		$23,204			
		of which	85%	$19,723 is labor			
		and	15%	$3,481 is materials and equipment.			
		Labor converts to at $100k per FTE.		197.23 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			29,031,300	5,251,300	
		CONSULTANT COST			$1,597	$289	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)	DURATION			24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)	PERSONS			605	109	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.	40 PER BUS			$36,289	$7,111	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$549.88	$0.00	$25.72	$575.60
State Sales Tax	0.00	$0.00	$37.87	$33.12	$70.99
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.07	$0.00	$8.75	$255.82
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.56	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.53	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.54	$461.19
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.62	$337.69
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.12
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$43.33	$2,772.89
State Sales Tax	0.00	$0.00	$71.92	$55.78	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,282.14
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$9.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.36	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.69	$243.38
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.64	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.69	$0.00	$13.85	$198.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.89
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	218.96	$6,063.05	$5,763.68	$4,427.93	$16,254.66
Ind. Labor & Material	72.26	$2,000.81	$0.00	$132.84	$2,133.65
State Sales Tax	0.00	$0.00	$216.14	$171.03	$387.17
QA/QC Impact	14.56	$403.19	$288.18	$228.04	$919.41
	305.78	$8,467.05	$6,268.00	$4,959.84	$19,694.89
Labor Contingency	76.44		Contractor Cost (0.15)		$2,857.24
			Contingency (0.25)		$5,762.29
Task 41024 Total	382.22				$28,311.42
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	95.73	$2,650.64	$7,336.32	$2,582.15	$12,569.11
Ind. Labor & Material	31.59	$874.71	$0.00	$77.46	$952.17
State Sales Tax	0.00	$0.00	$275.12	$99.74	$374.86
QA/QC Impact	6.37	$176.27	$366.81	$132.98	$676.06
	133.69	$3,701.62	$7,978.25	$2,892.33	$14,572.20
Labor Contingency	46.79		Contractor Cost (0.15)		$2,185.84
			Contingency (0.35)		$5,865.31
Task 41025 Total	180.48				$22,623.35
Subject 41020 Total	851.59				$84,552.54
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$1,689.82	$0.00	$1,689.82
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$63.37	$0.00	$63.37
QA/QC Impact	0.00	$0.00	$84.49	$0.00	$84.49
	0.00	$0.00	$1,837.68	$0.00	$1,837.68
Labor Contingency	0.00		Contractor Cost (0.15)		$275.65
			Contingency (0.35)		$739.67
Task 41045 Total	0.00				$2,853.00
Subject 41040 Total	0.00				$2,853.00
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	62.57	$1,888.97	$3,388.64	$2,130.93	$7,408.54
Ind. Labor & Material	20.65	$623.36	$0.00	$63.93	$687.29
State Sales Tax	0.00	$0.00	$127.07	$82.31	$209.38
QA/QC Impact	4.16	$125.62	$169.44	$109.74	$404.80
	87.38	$2,637.95	$3,685.15	$2,386.91	$8,710.01
Labor Contingency	26.21		Contractor Cost (0.15)		$1,306.50
			Contingency (0.30)		$3,004.96
Task 41060 Total	113.59				$13,021.47
Subject 41060 Total	113.59				$13,021.47
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	66.17	$1,832.12	$3,410.11	$121.09	$5,363.32
Ind. Labor & Material	21.84	$604.60	$0.00	$3.63	$608.23
State Sales Tax	0.00	$0.00	$127.88	$4.68	$132.56
QA/QC Impact	4.40	$121.84	$170.51	$6.24	$298.59
	92.40	$2,558.56	$3,708.50	$135.64	$6,402.70
Labor Contingency	23.10		Contractor Cost (0.15)		$960.40
			Contingency (0.25)		$1,840.79
Task 41070 Total	115.51				$9,203.89
Subject 41070 Total	115.51				$9,203.89
Category 41000 Total	1263.70				$130,458.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.98	$0.00	$3.56	$15.27
State Sales Tax	0.00	$0.00	$227.97	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$2,325.37	$0.00	$2,325.37
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$87.20	$0.00	$87.20
QA/QC Impact	0.00	$0.00	$116.27	$0.00	$116.27
	0.00	$0.00	$2,528.84	$0.00	$2,528.84
Labor Contingency	0.00		Contractor Cost (0.15)		$379.33
			Contingency (0.35)		$1,017.86
Task 42030 Total	0.00				$3,926.03
Subject 42030 Total	0.00				$3,926.03
Category 42000 Total	2.09				$20,761.30
Area 40000 Total	1265.79				$151,219.41
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.75	$1,074.95
State Sales Tax	0.00	$0.00	$37.14	$9.97	$47.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$83.84	$83.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	545.42	$17,480.23	$2,230.17	$1,195.22	$20,905.62
Ind. Labor & Material	178.99	$5,768.48	$0.00	$35.86	$5,804.34
State Sales Tax	0.00	$0.00	$83.63	$46.17	$129.80
QA/QC Impact	36.27	$1,162.44	$111.51	$61.55	$1,335.50
	761.68	$24,411.15	$2,425.31	$1,338.80	$28,175.26
Labor Contingency	228.50		Contractor Cost (0.15)		$4,226.29
			Contingency (0.30)		$9,720.47
Task 51031 Total	990.19				$42,122.02
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.47
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.29
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	999.01				$43,121.53
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.78	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.64	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	13.46	$372.66	$24.21	$243.54	$640.41
Ind. Labor & Material	4.44	$122.98	$0.00	$7.31	$130.29
State Sales Tax	0.00	$0.00	$0.90	$9.71	$10.61
QA/QC Impact	0.89	$24.78	$1.21	$12.54	$38.53
	18.79	$520.42	$26.32	$272.80	$819.54
Labor Contingency	5.64		Contractor Cost (0.15)		$122.93
			Contingency (0.30)		$282.77
Task 51050 Total	24.43				$1,225.21
Subject 51050 Total	24.43				$1,225.21
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	80.82	$2,237.93	$1,851.62	$651.50	$4,741.05
Ind. Labor & Material	26.67	$738.52	$0.00	$19.54	$758.06
State Sales Tax	0.00	$0.00	$69.44	$25.17	$94.60
QA/QC Impact	5.37	$148.82	$92.58	$33.55	$274.95
	112.87	$3,125.27	$2,013.64	$729.75	$5,868.66
Labor Contingency	33.86		Contractor Cost (0.15)		$880.30
			Contingency (0.30)		$2,024.69
Task 51060 Total	146.73				$8,773.65
Subject 51060 Total	146.73				$8,773.65
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.91	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.49
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$51.97
			Contingency (0.25)		$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.26
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.69	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.85
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1588.89				$82,554.16
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$409.64	$0.00	$20.10	$429.74
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$281.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.94	$31.93	$0.00	$0.59	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.52
			Contingency (0.30)		$52.36
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.99
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1801.63				$105,264.83

* TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT. 3762.82 x 10^3 man-hrs $331,480.50

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.47	$2,862.60	$0.00	$911.65	$3,678.25
State Sales Tax	0.00	$0.00	$22.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.37
			Contingency (0.30)		$5,932.74
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$76.77	$569.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.82	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64			Contractor Cost (0.15)	$230.73
				Contingency (0.25)	$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$130.56	$187.89
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68			Contractor Cost (0.15)	$1,506.33
				Contingency (0.25)	$2,887.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.15	$3,922.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86			Contractor Cost (0.15)	$4,710.56
				Contingency (0.25)	$9,611.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87			Contractor Cost (0.15)	$2,393.30
				Contingency (0.25)	$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	2280.19	$63,139.50	$14,226.87	$46,111.64	$123,478.01
Ind. Labor & Material	752.46	$20,836.04	$0.00	$1,383.35	$22,219.39
State Sales Tax	0.00	$0.00	$533.51	$1,781.06	$2,314.57
QA/QC Impact	151.63	$4,198.78	$711.34	$2,374.75	$7,284.87
	3184.29	$88,174.32	$15,471.72	$51,650.80	$155,296.84
Labor Contingency	796.07			Contractor Cost (0.15)	$23,294.53
				Contingency (0.25)	$44,647.84
Task 41024 Total	3980.36				$223,239.21
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1572.89	$43,546.36	$37,241.04	$42,420.92	$123,208.32
Ind. Labor & Material	518.99	$14,370.30	$0.00	$1,272.63	$15,642.93
State Sales Tax	0.00	$0.00	$1,398.57	$1,638.51	$3,035.05
QA/QC Impact	104.58	$2,895.83	$1,862.06	$2,184.68	$6,942.57
	2196.26	$60,812.49	$40,499.64	$47,516.74	$148,828.87
Labor Contingency	768.69			Contractor Cost (0.15)	$22,324.34
				Contingency (0.35)	$59,003.63
Task 41025 Total	2964.96				$231,056.84
Subject 41020 Total	8152.38				$538,727.17
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33			Contractor Cost (0.15)	$8,851.18
				Contingency (0.35)	$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	14.44	$399.85	$331.89	$425.63	$1,157.37
Ind. Labor & Material	4.77	$131.95	$0.00	$12.47	$144.72
State Sales Tax	0.00	$0.00	$12.45	$16.41	$28.86
QA/QC Impact	0.96	$26.59	$16.59	$21.92	$65.10
	20.17	$558.39	$360.93	$476.76	$1,396.08
Labor Contingency	7.06			Contractor Cost (0.15)	$209.42
				Contingency (0.35)	$561.92
Task 41045 Total	27.22				$2,167.42
Subject 41040 Total	27.22				$2,167.42
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	178.15	$5,297.10	$10,627.35	$3,152.07	$19,076.52
Ind. Labor & Material	58.13	$1,748.04	$0.00	$94.56	$1,842.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$398.53	$121.75	$520.28
QA/QC Impact	11.71	$352.26	$531.37	$162.33	$1,045.96
	245.99	$7,397.40	$11,557.25	$3,530.71	$22,485.36
Labor Contingency	73.80		Contractor Cost (0.15)		$3,372.80
			Contingency (0.30)		$7,757.46
Task 41060 Total	319.79				$33,615.62
Subject 41060 Total	319.79				$33,615.62
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	816.87	$22,619.67	$7,699.00	$10,780.23	$41,098.90
Ind. Labor & Material	268.57	$7,464.26	$0.00	$323.41	$7,787.90
State Sales Tax	0.00	$0.00	$288.71	$416.39	$705.10
QA/QC Impact	54.32	$1,504.21	$384.95	$555.18	$2,444.34
	1140.76	$31,588.37	$8,372.66	$12,075.21	$52,036.24
Labor Contingency	285.19		Contractor Cost (0.15)		$7,805.45
			Contingency (0.25)		$14,960.43
Task 41070 Total	1425.95				$74,802.12
Subject 41070 Total	1425.95				$74,802.12
Category 41000 Total	11076.04				$740,921.97
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	351.53	$11,509.10	$41,432.98	$34,833.64	$87,775.72
Ind. Labor & Material	116.00	$3,798.00	$0.00	$1,045.01	$4,843.01
State Sales Tax	0.00	$0.00	$1,553.73	$1,314.45	$2,868.18
QA/QC Impact	23.38	$765.36	$2,071.65	$1,793.93	$4,630.94
	490.91	$16,072.46	$45,058.36	$39,018.03	$100,148.85
Labor Contingency	171.82		Contractor Cost (0.15)		$15,022.33
			Contingency (0.35)		$40,309.91
Task 42010 Total	662.73				$155,481.09
Subject 42010 Total	662.73				$155,481.09
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	3.32	$108.85	$391.87	$329.45	$830.17
Ind. Labor & Material	1.10	$35.92	$0.00	$9.88	$45.80
State Sales Tax	0.00	$0.00	$14.69	$12.72	$27.41
QA/QC Impact	0.22	$7.24	$19.59	$16.97	$43.80
	4.64	$152.01	$426.15	$369.02	$947.18
Labor Contingency	1.63		Contractor Cost (0.15)		$142.08
			Contingency (0.35)		$381.23
Task 42030 Total	6.27				$1,470.49
Subject 42030 Total	6.27				$1,470.49
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.92	$95.60	$0.00	$0.00	$95.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	951.22				$220,896.50
Area 40000 Total	12027.27				$961,818.47
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	225.37	$6,137.78	$0.00	$41.33	$6,199.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.56
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3738.04	$119,978.13	$5,112.87	$7,577.93	$132,668.93
Ind. Labor & Material	1233.55	$39,592.78	$0.00	$227.34	$39,820.12
State Sales Tax	0.00	$0.00	$191.74	$292.70	$484.44
QA/QC Impact	248.58	$7,978.55	$255.65	$390.26	$8,624.46

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	5220.18	$167,549.46	$5,560.26	$8,488.23	$181,597.95
Labor Contingency	1566.05		Contractor Cost (0.15)		$27,239.70
			Contingency (0.30)		$62,651.29
Task 51031 Total	6786.23				$271,488.94
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$49.05	$130.94	$179.99
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.96
Labor Contingency	686.05		Contractor Cost (0.15)		$11,804.70
			Contingency (0.30)		$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	9759.13				$389,142.41
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.49	$32.65	$47.14
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
Labor Contingency	86.84		Contractor Cost (0.15)		$1,647.73
			Contingency (0.25)		$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	354.47	$9,815.47	$1,698.19	$3,541.67	$15,055.33
Ind. Labor & Material	112.68	$3,239.11	$0.00	$106.25	$3,345.36
State Sales Tax	0.00	$0.00	$63.69	$136.80	$200.49
QA/QC Impact	23.57	$652.73	$84.91	$182.40	$920.04
	495.02	$13,707.31	$1,846.79	$3,967.12	$19,521.22
Labor Contingency	148.51		Contractor Cost (0.15)		$2,928.18
			Contingency (0.30)		$6,734.83
Task 51050 Total	643.53				$29,184.23
Subject 51050 Total	643.53				$29,184.23
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	462.09	$12,795.20	$8,197.24	$3,468.97	$24,461.41
Ind. Labor & Material	152.49	$4,222.42	$0.00	$104.07	$4,326.49
State Sales Tax	0.00	$0.00	$307.40	$133.99	$441.39
QA/QC Impact	30.73	$850.88	$409.87	$178.65	$1,439.40
	645.30	$17,868.50	$8,914.51	$3,885.68	$30,668.69
Labor Contingency	193.59		Contractor Cost (0.15)		$4,600.30
			Contingency (0.30)		$10,580.70
Task 51060 Total	838.90				$45,849.69
Subject 51060 Total	838.90				$45,849.69
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$92.06	$42.23	$134.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
Labor Contingency	9.79		Contractor Cost (0.15)		$755.49
			Contingency (0.25)		$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
Labor Contingency	0.54		Contractor Cost (0.15)		$92.60
			Contingency (0.25)		$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
Labor Contingency	0.95		Contractor Cost (0.15)		$426.70
			Contingency (0.25)		$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47			Contractor Cost (0.15)	$3,063.79
				Contingency (0.30)	$7,046.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax	0.00	$0.00	$0.18	$26.84	$27.02
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73			Contractor Cost (0.15)	$2,075.07
				Contingency (0.25)	$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	14114.42				$586,299.80
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64			Contractor Cost (0.15)	$2,153.85
				Contingency (0.25)	$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.64	$2.92	$3.56
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46			Contractor Cost (0.15)	$159.64
				Contingency (0.30)	$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72			Contractor Cost (0.15)	$238.81
				Contingency (0.30)	$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.42	$0.00	$11.14	$141.56
State Sales Tax	0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact	0.95	$26.28	$1.97	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98			Contractor Cost (0.15)	$151.61
				Contingency (0.30)	$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.37	$10,365.32	$0.00	$243.04	$10,608.36
State Sales Tax	0.00	$0.00	$300.65	$699.16	$999.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37			Contractor Cost (0.15)	$10,928.80
				Contingency (0.35)	$25,525.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	16251.94				$728,526.14

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 29031.25 x 10^3 man-hrs $1,731,814.99

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,628.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$64.05	$1,614.63
State Sales Tax	0.00	$0.00	$21.68	$82.46	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13			Contractor Cost (0.15)	$1,437.10
				Contingency (0.30)	$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46			Contractor Cost (0.15)	$39.21
				Contingency (0.30)	$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22			Contractor Cost (0.15)	$39.21
				Contingency (0.25)	$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22			Contractor Cost (0.15)	$39.21
				Contingency (0.25)	$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$39.83	$574.15
State Sales Tax	0.00	$0.00	$12.45	$51.29	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50			Contractor Cost (0.15)	$616.41
				Contingency (0.30)	$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89			Contractor Cost (0.15)	$500.52
				Contingency (0.30)	$1,151.22
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28			Contractor Cost (0.15)	$249.95
				Contingency (0.25)	$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	472.16	$13,074.11	$4,133.91	$8,890.18	$26,098.20
Ind. Labor & Material	155.81	$4,314.46	$0.00	$266.71	$4,581.17
State Sales Tax	0.00	$0.00	$155.02	$343.38	$498.40
QA/QC Impact	31.40	$869.43	$206.69	$457.84	$1,533.96
	659.37	$18,258.00	$4,495.62	$9,958.11	$32,711.73
Labor Contingency	164.84		Contractor Cost (0.15)		$4,906.76
			Contingency (0.25)		$9,404.62
Task 41070 Total	824.21				$47,023.11
Subject 41070 Total	824.21				$47,023.11
Category 41000 Total	824.21				$47,023.11
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.33
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	847.89				$49,474.96
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.64	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$36.58	$57.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.72	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.84	$22.05
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.45
			Contingency (0.30)		$2,080.24
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT		LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)			
		40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency		10.17		Contractor Cost (0.15)		$176.84
				Contingency (0.25)		$338.95
Task	51040 Total	50.83				$1,694.71
Subject	51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)						
51050 Ventilation System (Waste Emplacement)						
Direct Cost		128.47	$3,557.35	$1,293.04	$855.28	$5,705.67
Ind. Labor & Material		42.40	$1,173.63	$0.00	$25.66	$1,199.29
State Sales Tax		0.00	$0.00	$48.49	$33.04	$81.53
QA/QC Impact		8.54	$236.56	$64.65	$44.05	$345.26
		179.41	$4,967.84	$1,406.18	$958.03	$7,332.05
Labor Contingency		53.82		Contractor Cost (0.15)		$1,099.81
				Contingency (0.30)		$2,529.57
Task	51050 Total	233.23				$10,961.43
Subject	51050 Total	233.23				$10,961.43
51070 Mine Water Control System						
51070 Mine Water Control System						
Direct Cost		30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material		10.02	$277.59	$0.00	$35.53	$313.12
State Sales Tax		0.00	$0.00	$101.90	$45.75	$147.65
QA/QC Impact		2.02	$55.94	$135.86	$60.99	$252.79
		42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency		10.60		Contractor Cost (0.15)		$818.45
				Contingency (0.25)		$1,568.68
Task	51070 Total	53.01				$7,843.40
Subject	51070 Total	53.01				$7,843.40
51080 Fire Protection/Control						
51080 Fire Protection/Control						
Direct Cost		0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material		0.27	$8.69	$0.00	$0.14	$8.13
State Sales Tax		0.00	$0.00	$12.82	$0.18	$13.00
QA/QC Impact		0.06	$1.81	$17.10	$0.24	$19.15
		1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency		0.29		Contractor Cost (0.15)		$62.26
				Contingency (0.25)		$119.34
Task	51080 Total	1.45				$596.70
Subject	51080 Total	1.45				$596.70
51090 Operations Support Facility						
51090 Operations Support Facility						
Direct Cost		2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material		0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax		0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact		0.20	$6.71	$40.00	$9.40	$56.11
		4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency		1.03		Contractor Cost (0.15)		$182.30
				Contingency (0.25)		$349.40
Task	51090 Total	5.17				$1,747.03
Subject	51090 Total	5.17				$1,747.03
51100 Contamination Control System						
51100 Contamination Control System						
Direct Cost		212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material		70.09	$2,319.59	$0.00	$51.70	$2,371.29
State Sales Tax		0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact		14.12	$467.43	$59.49	$88.75	$615.67
		296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency		88.99		Contractor Cost (0.15)		$1,956.04
				Contingency (0.30)		$4,498.90
Task	51100 Total	385.61				$19,495.22
Subject	51100 Total	385.61				$19,495.22
51110 Control Room Facility						
51110 Control Room Facility						
Direct Cost		365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material		120.55	$3,340.78	$0.00	$22.59	$3,363.38
State Sales Tax		0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact		24.29	$673.22	$0.26	$38.77	$712.25
		510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency		127.54		Contractor Cost (0.15)		$2,248.00
				Contingency (0.25)		$4,308.66
Task	51110 Total	637.68				$21,543.31
Subject	51110 Total	637.68				$21,543.31
Category	51000 Total	2736.60				$116,511.01
52000 UTILITIES						
52010 Electrical						
52010 Electrical						
Direct Cost		52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material		17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax		0.00	$0.00	$114.06	$22.44	$136.50
QA/QC Impact		3.46	$117.81	$152.09	$29.92	$299.82
		72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency		18.15		Contractor Cost (0.15)		$964.92
				Contingency (0.25)		$1,849.43
Task	52010 Total	90.77				$9,247.15
Subject	52010 Total	90.77				$9,247.15
52020 Communications						
52020 Communications						

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	9.82	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,908.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.39	$0.00	$241.67	$5,259.06
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3849.25				$197,293.64

* TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT. 5251.31 x 10^3 man-hrs $278,157.30 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	112.61	$3,686.69	$283.48	$1,655.36	$5,625.53
Ind. Labor & Material	37.16	$1,216.61	$0.00	$49.66	$1,266.27
State Sales Tax	0.00	$0.00	$10.63	$63.94	$74.57
QA/QC Impact	7.49	$245.17	$14.17	$85.25	$344.59
	157.26	$5,148.47	$308.28	$1,854.21	$7,310.96
Labor Contingency	47.18		Contractor Cost (0.15)		$1,096.65
			Contingency (0.30)		$2,522.28
Task 23011 Total	204.43				$10,929.89
Subject 23010 Total	204.43				$10,929.89
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.57		Contractor Cost (0.15)		$15.38
			Contingency (0.30)		$35.39
Task 23085 Total	2.48				$153.34
Subject 23080 Total	2.48				$153.34
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.37	$44.72	$7.18	$28.84	$80.74
Ind. Labor & Material	0.45	$14.76	$0.00	$0.87	$15.63
State Sales Tax	0.00	$0.00	$0.27	$1.11	$1.38
QA/QC Impact	0.09	$2.97	$0.36	$1.49	$4.82
	1.91	$62.45	$7.81	$32.31	$102.57
Labor Contingency	0.48		Contractor Cost (0.15)		$15.38
			Contingency (0.25)		$29.49
Task 23105 Total	2.39				$147.44
Subject 23100 Total	2.39				$147.44
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.23	$40.34	$6.48	$26.01	$72.83
Ind. Labor & Material	0.41	$13.31	$0.00	$0.78	$14.09
State Sales Tax	0.00	$0.00	$0.24	$1.00	$1.24
QA/QC Impact	0.08	$2.68	$0.32	$1.34	$4.34
	1.72	$56.33	$7.04	$29.13	$92.50
Labor Contingency	0.43		Contractor Cost (0.15)		$13.87
			Contingency (0.25)		$26.60
Task 23115 Total	2.15				$132.97
Subject 23110 Total	2.15				$132.97
Category 23000 Total	211.45				$11,363.64
Area 20000 Total	211.45				$11,363.64
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	17.20	$476.40	$97.67	$390.67	$964.74
Ind. Labor & Material	5.68	$157.21	$0.00	$11.72	$168.93
State Sales Tax	0.00	$0.00	$3.66	$15.09	$18.75
QA/QC Impact	1.14	$31.68	$4.88	$20.12	$56.68
	24.03	$665.29	$106.21	$437.60	$1,209.10
Labor Contingency	7.21		Contractor Cost (0.15)		$181.36
			Contingency (0.30)		$417.14
Task 30010 Total	31.23				$1,807.60
Subject 30010 Total	31.23				$1,807.60
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	9.31	$257.87	$52.88	$211.53	$522.28
Ind. Labor & Material	3.07	$85.10	$0.00	$6.35	$91.45
State Sales Tax	0.00	$0.00	$1.98	$8.17	$10.15
QA/QC Impact	0.62	$17.15	$2.64	$10.89	$30.68
	13.01	$360.12	$57.50	$236.94	$654.56
Labor Contingency	3.90		Contractor Cost (0.15)		$98.18
			Contingency (0.30)		$225.82
Task 30080 Total	16.91				$978.56
Subject 30080 Total	16.91				$978.56
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.65	$128.79	$26.40	$105.60	$260.79
Ind. Labor & Material	1.53	$42.50	$0.00	$3.17	$45.67
State Sales Tax	0.00	$0.00	$0.99	$4.08	$5.07
QA/QC Impact	0.31	$8.56	$1.32	$5.44	$15.32
	6.50	$179.85	$28.71	$118.29	$326.85
Labor Contingency	1.62		Contractor Cost (0.15)		$42.03
			Contingency (0.25)		$93.97
Task 30106 Total	8.12				$469.85
Subject 30100 Total	8.12				$469.85

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.20	$116.17	$23.81	$95.25	$235.23
Ind. Labor & Material	1.38	$38.34	$0.00	$2.86	$41.20
State Sales Tax	0.00	$0.00	$0.89	$3.68	$4.57
QA/QC Impact	0.28	$7.73	$1.19	$4.91	$13.83
	5.86	$162.24	$25.89	$106.70	$294.83
Labor Contingency	1.46		Contractor Cost (0.15)		$44.22
			Contingency (0.25)		$84.78
Task 30116 Total	7.32				$423.83
Subject 30110 Total	7.32				$423.83
Category 30000 Total	63.58				$3,679.84
Area 30000 Total	63.58				$3,679.84
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	183.87	$5,091.16	$2,591.04	$723.22	$8,405.42
Ind. Labor & Material	60.68	$1,680.08	$0.00	$21.70	$1,701.78
State Sales Tax	0.00	$0.00	$97.16	$27.93	$125.09
QA/QC Impact	12.23	$338.56	$129.55	$37.25	$505.36
	256.77	$7,109.80	$2,817.75	$810.10	$10,737.65
Labor Contingency	64.19		Contractor Cost (0.15)		$1,610.64
			Contingency (0.25)		$2,087.07
Task 41070 Total	320.97				$15,435.36
Subject 41070 Total	320.97				$15,435.36
Category 41000 Total	320.97				$15,435.36
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$6.83	$222.88
State Sales Tax	0.00	$0.00	$24.75	$8.79	$33.54
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33			Contractor Cost (0.15)	$11.20
				Contingency (0.40)	$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	721.70	$20,177.56	$17,882.98	$10,832.96	$48,893.50
Ind. Labor & Material	238.16	$6,658.59	$0.00	$324.99	$6,983.58
State Sales Tax	0.00	$0.00	$670.61	$418.42	$1,089.03
QA/QC Impact	47.99	$1,341.81	$894.15	$557.90	$2,793.86
	1007.85	$28,177.96	$19,447.74	$12,134.27	$59,759.97
Labor Contingency	403.14			Contractor Cost (0.15)	$8,964.00
				Contingency (0.40)	$27,489.59
Task 43300 Total	1411.00				$96,213.56
Subject 43300 Total	1411.00				$96,213.56
Category 43000 Total	1613.07				$107,190.38
Area 40000 Total	1934.04				$122,625.74
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	204.39	$5,660.07	$821.36	$420.06	$6,901.49
Ind. Labor & Material	67.45	$1,867.82	$0.00	$12.60	$1,880.42
State Sales Tax	0.00	$0.00	$30.80	$16.22	$47.02
QA/QC Impact	13.59	$376.39	$41.07	$21.63	$439.09
	285.44	$7,904.28	$893.23	$470.51	$9,268.02
Labor Contingency	71.36			Contractor Cost (0.15)	$1,390.19
				Contingency (0.25)	$2,664.56
Task 51011 Total	356.79				$13,322.77
Subject 51010 Total	356.79				$13,322.77
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	330.34	$10,589.31	$899.65	$730.77	$12,219.73
Ind. Labor & Material	109.01	$3,494.47	$0.00	$21.92	$3,516.38
State Sales Tax	0.00	$0.00	$33.74	$28.23	$61.97
QA/QC Impact	21.97	$704.19	$44.99	$37.63	$786.81
	461.31	$14,787.97	$978.38	$818.55	$16,584.90
Labor Contingency	138.39			Contractor Cost (0.15)	$2,487.74
				Contingency (0.30)	$5,721.80
Task 51031 Total	599.71				$24,794.44
Subject 51030 Total	599.71				$24,794.44
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	103.53	$2,866.66	$172.42	$381.74	$3,420.82
Ind. Labor & Material	34.16	$946.00	$0.00	$11.45	$957.45
State Sales Tax	0.00	$0.00	$6.46	$14.74	$21.20
QA/QC Impact	6.88	$190.63	$8.62	$19.66	$218.91
	144.58	$4,003.29	$187.50	$427.59	$4,618.38
Labor Contingency	36.14			Contractor Cost (0.15)	$692.76
				Contingency (0.25)	$1,327.78
Task 51040 Total	180.72				$6,638.92
Subject 51040 Total	180.72				$6,638.92
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	168.68	$4,670.82	$4,698.29	$3,970.12	$13,339.23
Ind. Labor & Material	55.67	$1,541.37	$0.00	$119.10	$1,660.47
State Sales Tax	0.00	$0.00	$176.19	$153.35	$329.54
QA/QC Impact	11.22	$310.61	$234.92	$204.46	$749.99
	235.57	$6,522.80	$5,109.40	$4,447.03	$16,079.23
Labor Contingency	70.67			Contractor Cost (0.15)	$2,411.88
				Contingency (0.30)	$5,547.33
Task 51050 Total	306.24				$24,038.44
Subject 51050 Total	306.24				$24,038.44
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	11.91	$330.01	$1,065.97	$464.63	$1,860.61
Ind. Labor & Material	3.93	$108.90	$0.00	$13.94	$122.84
State Sales Tax	0.00	$0.00	$39.97	$17.95	$57.92
QA/QC Impact	0.79	$21.95	$53.30	$23.93	$99.18
	16.64	$460.86	$1,159.24	$520.45	$2,140.55
Labor Contingency	4.16			Contractor Cost (0.15)	$321.09
				Contingency (0.25)	$615.42
Task 51070 Total	20.80				$3,077.06
Subject 51070 Total	20.80				$3,077.06
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.65	$21.37	$210.00	$3.71	$235.08
Ind. Labor & Material	0.22	$7.05	$0.00	$0.11	$7.16
State Sales Tax	0.00	$0.00	$7.87	$0.14	$8.01
QA/QC Impact	0.04	$1.42	$10.50	$0.19	$12.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.91	$29.84	$228.37	$4.15	$262.36
Labor Contingency	0.23		Contractor Cost (0.15)		$39.35
			Contingency (0.25)		$75.42
Task 51080 Total	1.14				$377.13
Subject 51080 Total	1.14				$377.13
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.58	$19.79	$930.09	$115.54	$1,065.42
Ind. Labor & Material	0.18	$6.23	$0.00	$3.47	$10.00
State Sales Tax	0.00	$0.00	$34.88	$4.46	$39.34
QA/QC Impact	0.04	$1.32	$46.51	$5.95	$53.78
	0.81	$27.64	$1,011.48	$129.42	$1,168.54
Labor Contingency	0.20		Contractor Cost (0.15)		$175.68
			Contingency (0.25)		$335.96
Task 51090 Total	1.01				$1,679.78
Subject 51090 Total	1.01				$1,679.78
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	133.46	$4,384.31	$799.33	$815.40	$5,999.04
Ind. Labor & Material	44.04	$1,446.82	$0.00	$24.46	$1,471.28
State Sales Tax	0.00	$0.00	$29.97	$31.49	$61.46
QA/QC Impact	8.88	$291.56	$39.97	$41.99	$373.52
	186.38	$6,122.69	$869.27	$913.34	$7,905.30
Labor Contingency	55.91		Contractor Cost (0.15)		$1,185.80
			Contingency (0.30)		$2,727.33
Task 51100 Total	242.30				$11,818.43
Subject 51100 Total	242.30				$11,818.43
Category 51000 Total	1708.70				$85,746.97
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	42.00	$1,430.94	$5,781.23	$300.18	$7,512.35
Ind. Labor & Material	13.86	$472.21	$0.00	$9.01	$481.22
State Sales Tax	0.00	$0.00	$216.80	$11.59	$228.39
QA/QC Impact	2.79	$95.16	$289.06	$15.46	$399.68
	58.65	$1,998.31	$6,287.09	$336.24	$8,621.64
Labor Contingency	14.66		Contractor Cost (0.15)		$1,293.24
			Contingency (0.25)		$2,278.72
Task 52010 Total	73.32				$12,393.60
Subject 52010 Total	73.32				$12,393.60
52020 Communications					
52020 Communications					
Direct Cost	6.01	$204.69	$2.90	$18.62	$226.21
Ind. Labor & Material	1.98	$67.55	$0.00	$0.56	$68.11
State Sales Tax	0.00	$0.00	$0.11	$0.72	$0.83
QA/QC Impact	0.40	$13.61	$0.14	$0.96	$14.71
	8.39	$285.85	$3.15	$20.86	$309.86
Labor Contingency	2.52		Contractor Cost (0.15)		$46.48
			Contingency (0.30)		$106.91
Task 52020 Total	10.91				$463.25
Subject 52020 Total	10.91				$463.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	139.02	$3,849.25	$17,414.69	$6,996.59	$28,260.53
Ind. Labor & Material	45.88	$1,270.25	$0.00	$209.90	$1,480.15
State Sales Tax	0.00	$0.00	$653.05	$270.24	$923.29
QA/QC Impact	9.24	$255.98	$870.74	$360.32	$1,487.04
	194.14	$5,375.48	$18,938.48	$7,837.05	$32,151.01
Labor Contingency	58.24		Contractor Cost (0.15)		$4,822.65
			Contingency (0.30)		$11,092.09
Task 52040 Total	252.38				$48,065.75
Subject 52040 Total	252.38				$48,065.75
Category 52000 Total	336.60				$60,922.60
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	146.25	$4,744.26	$1,398.25	$3,160.30	$9,302.81
Ind. Labor & Material	48.26	$1,565.61	$0.00	$94.81	$1,660.42
State Sales Tax	0.00	$0.00	$52.44	$122.07	$174.51
QA/QC Impact	9.73	$315.49	$69.92	$162.76	$548.17
	204.24	$6,625.36	$1,520.61	$3,539.94	$11,685.91
Labor Contingency	71.48		Contractor Cost (0.15)		$1,752.89
			Contingency (0.35)		$4,703.58
Task 53000 Total	275.72				$18,142.38
Subject 53000 Total	275.72				$18,142.38
Category 53000 Total	275.72				$18,142.38
Area 50000 Total	2321.03				$164,811.95

* TOTAL LABOR HOURS AND COST FOR 4530.10 x 10^3 man-hrs $302,481.17 PHASE 4 OF PROJECT. *

Case 8

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Summary Cost Matrix (Table 1)

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Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

Underground Facilities, Project Phase 1 (Capital Costs - Engineering and Construction)

Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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TABLE 1, MRS SYSTEMS STUDY - CASE 8 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMIS-SIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$243.33	$26.97	$26.51	$53.48	$14.61	$6.87	$21.47	$318.28
	1000	SUPPORT CONTRACTOR	$37.13	$0.00	$0.00	$0.00	$2.92	$0.90	$3.82	$40.95
	1010	Surface	$22.24			$0.00		$0.90	$0.90	
	1020	Subsurface	$14.89			$0.00	$2.92		$2.92	
	2000	ARCHITECT-ENGINEER	$148.52	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$11.69	$3.58	$15.27	$163.78
	2010	Surface	$88.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$59.58	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$11.69		$11.69	
	3000	CONSTRUCTION MANAGEMENT	$56.68	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$59.07
	3010	Surface	$34.42	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$22.26			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$2.97	$0.51	$3.48			$0.00	$3.48
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$85.34	$15.85	$101.19	$1.51	$39.85	$41.36	$320.56
	11000	EMPLOYEE TRANSPORTATION		$77.45	$13.51	$90.96	$1.20		$1.20	$92.16
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$333.80	$1,510.71	$214.35	$1,725.06	$42.39	$20.31	$62.70	$2,121.57
4.3.2.1	21000	WASTE HANDLING FACILITY	$197.90	$519.38	$28.50	$547.89	XXXXXXXXXXX	$13.15	$13.15	$758.93
	21100	Waste Handling Building 1:	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	$0.00	
4.3.2.1.2	21102	Building/Structures	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$0.00			$0.00	XXXXXXXXXXX		$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 8 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$152.58	$0.00	$0.00	$0.00	XXXXXXXXXXX	$8.95	$8.95	
4.3.2.1.9	21202	Building/Structures	$68.82			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$20.55			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$10.67			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$7.58			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$40.56			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$4.40			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$45.32	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.20	$4.20	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.02			$0.00	XXXXXXXXXXX	$1.69	$1.69	
	21502	Vehicle Wash Facility	$0.79			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.43			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$88.48	$964.55	$170.38	$1,134.94	$32.37	$4.45	$36.82	$1,260.24
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.02		$19.02	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.49			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$10.53			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$10.03	$2.71	$12.74	$102.40
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$9.64	$0.67	$10.31	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04	$9.64		$9.64	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE B COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.14	$2.04	$2.18	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.14		$0.14	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.13		$0.13	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.12	$0.00	$0.12	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.12		$0.12	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.24	XXXXXXXXXXX	$3.24	$99.43
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.59	XXXXXXXXXXX	$1.59	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.86	XXXXXXXXXXX	$0.86	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXX	$0.41	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXX	$0.41	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXXX	$0.37	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXXX	$0.37	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$143.01	$824.22	$43.88	$868.10	$107.69	XXXXXXXXXXX	$107.69	$1,118.80
4.3.4.1	41000	DEVELOPMENT	$122.83	$635.00	$41.43	$676.43	$13.60	XXXXXXXXXXX	$13.60	$812.86
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$76.91	$436.19	XXXXXXXXXXX	$436.19	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXX	$14.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXX	$47.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXX	$22.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41024	Emplacement Drifts	$23.75	$175.51	XXXXXXXXXXX	$175.51	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$19.55	$176.25	XXXXXXXXXXX	$176.25	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$3.33	$9.62	XXXXXXXXXXX	$9.62	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$3.33	$9.62	XXXXXXXXXXX	$9.62	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41060	Excavated Material Handling	$12.87	$31.64	$0.00	$31.64	$0.00	XXXXXXXXXXX	$0.00	
	41070	General Maintenance	$8.89	$65.93	$41.43	$107.36	$13.60	XXXXXXXXXXX	$13.60	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.18	$189.22	$2.45	$191.67	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$211.85
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$118.77	$0.00	$118.77	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.35	$6.50	$0.00	$6.50	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	

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TABLE 1, MRS SYSTEMS STUDY - CASE 8 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$94.09	XXXXXXXXXXXX	$94.09	$94.09
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$4.98	XXXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$3.04	XXXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$1.69	XXXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.59	XXXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.56	XXXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXXX	$0.12	XXXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$83.12	XXXXXXXXXXXX	$83.12	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$100.03	$670.01	$195.03	$865.05	$146.03	XXXXXXXXXXXX	$146.03	$1,111.11
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$77.32	$527.79	$114.25	$642.04	$75.37	XXXXXXXXXXXX	$75.37	$794.73
4.3.5.1.1	51010	Material Support, Receiving/warehousing	$12.96	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXXX	$11.76	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXXX	$11.76	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$39.88	$345.65	$33.44	$379.09	$21.88	XXXXXXXXXXXX	$21.88	
	51031	Development Area	$38.88	$228.00	$24.42	$252.42	$21.88	XXXXXXXXXXXX	$21.88	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$5.93	XXXXXXXXXXXX	$5.93	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.01	$23.47	$8.70	$32.17	$20.85	XXXXXXXXXXXX	$20.85	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$7.00	$36.54	$0.00	$36.54	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.7	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$2.72	XXXXXXXXXXXX	$2.72	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.33	XXXXXXXXXXXX	$0.33	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.48	XXXXXXXXXXXX	$1.48	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$10.43	XXXXXXXXXXXX	$10.43	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$54.66	XXXXXXXXXXXX	$54.66	$117.93
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$10.98	XXXXXXXXXXXX	$10.98	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.41	XXXXXXXXXXXX	$0.41	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$43.27	XXXXXXXXXXXX	$43.27	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$16.01	XXXXXXXXXXXX	$16.01	$198.45
		TOTAL REPOSITORY	$1,063.77	$3,131.95	$511.55	$3,643.50	$315.48	$67.02	$382.50	$5,089.76
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$31.12
	61000	SPENT FUEL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$0.00
	61010	Intact PWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$0.00
	63000	OTHER WASTE	XXXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	$31.12
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXXX	$16.00		$16.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXX	
	99999	TOTAL REPOSITORY, with EMPLACEMENT CONTAINERS	$1,063.77	$3,154.33	$520.29	$3,674.62	$315.48	$67.02	$382.50	$5,120.88

DATE: 14-Nov-88
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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 8
(DOLLARS IN THOUSANDS - IIIQTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.5	2,383.5	0.0	3,021.0	637.5	89.4 25%	937.0	4,684.9	320.1	5,005.0 10%	365.9	18.3	96.1	480.3	5,485.3
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9 25%	588.1	2,940.6	200.6	3,141.2 10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0 25%	79.4	396.8	27.2	424.0 10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.1	0.0	0.0	822.1	822.1	0.0 20%	328.8	1,973.0	138.1	2,111.1 5%	82.2	4.1	17.3	103.6	2,214.7
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0 20%	696.1	4,176.5	292.4	4,468.9 5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3 20%	36.5	218.8	15.2	234.0 5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0 20%	143.5	860.9	60.3	921.2 5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.9	448.4	0.0	697.3	248.9	16.8 20%	192.6	1,155.6	79.5	1,235.1 5%	47.3	2.4	9.9	59.6	1,294.7
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,327.9	9,219.8	2,076.1	267.9 30%	3,469.1	15,032.9	1,027.9	16,060.8 15%	1,694.4	84.7	533.7	2,312.8	18,373.6
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.4	0.0	41.9	16.5	1.0 20%	11.9	71.3	4.9	76.2 5%	2.9	0.1	0.6	3.6	79.8
		SUBTOTAL 120 - ON SITE	222.4	$6,383.6	$6,316.3	$5,501.5	$18,201.4	$6,383.6	$443.3	$6,483.0	$31,511.3	$2,166.2	$33,677.5	$2,672.0	$133.7	$771.9	$3,577.6	$37,255.1
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1 25%	2,294.6	11,473.0	784.7	12,257.7 10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8 30%	1,598.4	6,926.5	477.0	7,403.5 15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.5	68,508.6	0.0	82,398.1	13,889.5	2,569.1 25%	24,714.2	123,570.9	8,425.2	131,996.1 10%	9,628.8	481.4	2,527.6	12,637.8	144,633.9
	130.50	OFF SITE - UTILITIES	39.1	1,133.4	949.5	224.7	2,307.6	1,133.4	44.0 30%	1,045.5	4,530.5	313.1	4,843.6 15%	516.2	25.8	162.6	704.6	5,548.2
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0 25%	6,961.1	34,805.6	2,386.7	37,192.3 10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.7	$24,233.4	$92,517.9	$230.0	$116,981.3	$24,233.4	$3,478.0	$36,613.8	$181,306.5	$12,386.7	$193,693.2	$14,555.7	$727.7	$3,889.3	$19,172.7	$212,865.9
4.3.1		TOTAL 100 - SITE	1,058.1	$30,617.0	$98,834.2	$5,731.5	$135,182.7	$30,617.0	$3,921.3	$43,096.8	$212,817.8	$14,552.9	227,370.7	$17,227.7	$861.4	$4,661.2	$22,750.3	$250,121.0
	211.02	MHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.03	MHB I - HOT CELL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.04	MHB I - UTILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.05	MHB I - HVAC EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.06	MHB I - HANDL/PACK EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
	211.07	MHB I - SUPPORT FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0 40%	0.0	0.0	0.0	0.0 25%	0.0	0.0	0.0	0.0	0.0
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	579.4	16,801.2	14,009.8	982.2	31,793.2	16,801.2	562.2 40%	19,662.6	68,819.2	4,762.2	73,581.4 25%	12,148.6	607.4	5,102.4	17,858.4	91,439.8
	212.03	MHB II - HOT CELL EQUIP	72.3	2,097.7	0.0	10,104.1	12,201.8	2,097.7	378.9 40%	5,871.4	20,549.8	1,401.4	21,951.2 25%	3,574.9	178.7	1,501.4	5,255.0	27,206.2
	212.04	MHB II - UTILITIES	93.4	2,575.2	958.9	1,421.9	4,956.0	2,575.2	89.3 40%	3,048.2	10,668.7	738.1	11,406.8 25%	1,882.8	94.1	790.8	2,767.7	14,174.5
	212.05	MHB II - HVAC EQUIPMENT	42.7	1,238.2	1,336.8	1,493.6	4,068.6	1,238.2	106.1 40%	2,165.2	7,578.1	520.1	8,098.2 25%	1,326.7	66.3	557.2	1,950.2	10,048.4
	212.06	MHB II - HANDL/PACK EQUIP	145.0	4,204.2	0.0	19,817.6	24,021.8	4,204.2	743.2 40%	11,587.7	40,556.9	2,766.1	43,323.0 25%	7,056.5	352.8	2,963.7	10,373.0	53,696.0
	212.07	MHB II - SUPPORT FAC.	7.6	221.2	0.0	2,599.9	2,821.1	221.2	97.5 40%	1,255.9	4,395.7	298.1	4,693.8 25%	760.6	38.0	319.4	1,118.0	5,811.8
		SUBTOTAL 212 - MHB II	940.4	$27,137.7	$16,305.5	$36,419.3	$79,862.5	$27,137.7	$1,977.2	$43,591.0	$152,568.4	$10,486.0	$163,054.4	$26,750.1	$1,337.3	$11,234.9	$39,322.3	$202,376.7
	215.01	WASTE TREATMENT BUILDING	115.6	3,351.6	2,717.5	4,605.3	10,674.4	3,351.6	274.6 40%	5,720.2	20,020.8	1,374.5	21,395.3 25%	3,506.5	175.3	1,472.7	5,154.5	26,549.8
	215.02	VEHICLE WASH FACILITY	4.7	135.3	171.7	152.0	459.0	135.3	12.1 30%	181.9	788.3	54.1	842.4 15%	89.1	4.5	28.1	121.7	964.1
	215.03	DECONTAMINATION BUILDING	20.0	579.2	906.5	516.5	2,002.2	579.2	53.4 30%	790.4	3,425.2	234.9	3,660.1 15%	387.2	19.4	122.0	528.6	4,188.7
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.6	10,756.9	4,045.2	251.7 40%	6,021.5	21,075.3	1,450.6	22,525.9 25%	3,700.5	185.0	1,554.2	5,439.7	27,965.6
		SUBTOTAL 215 - OTHER	280.0	$8,111.3	$7,360.8	$8,420.4	$23,892.5	$8,111.3	$591.8	$12,714.0	$45,309.6	$3,114.1	$48,423.7	$7,683.3	$384.2	$3,177.0	$11,244.5	$59,668.2
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	1,220.4	$35,249.0	$23,666.3	$44,839.7	$103,755.0	$35,249.0	$2,569.0	$56,305.0	$197,878.0	$13,600.1	$211,478.1	$34,433.4	$1,721.5	$14,411.9	$50,566.8	$262,044.9

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 8
(DOLLARS IN THOUSANDS - 1111QTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.1	888.9	1,875.2	509.2	51.2 25%	608.9	3,044.5	208.6	3,253.1 10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2 25%	303.3	1,516.4	104.6	1,621.0 10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.8	568.0	803.2	1,986.0	614.8	51.4 30%	795.7	3,447.9	236.7	3,684.6 15%	390.1	19.5	122.9	532.5	4,217.1
	220.40	MAINTENANCE FACILITIES	49.4	1,433.2	1,828.3	415.4	3,676.9	1,433.2	84.1 25%	1,298.6	6,492.8	447.1	6,939.9 10%	511.0	25.6	134.2	670.8	7,610.7
	220.50	ADMIN/PERSONNEL FACILITIES	89.1	2,582.9	2,290.7	536.2	5,409.8	2,582.9	106.0 30%	2,429.6	10,528.3	727.3	11,255.6 15%	1,198.9	59.9	377.6	1,636.4	12,892.0
	220.60	MOCK-UP BUILDING	20.6	595.9	957.0	501.3	2,054.2	595.9	54.7 30%	811.4	3,516.2	241.2	3,757.4 15%	397.5	19.9	125.2	542.6	4,300.0
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.2	4,477.5	375.5	7,327.2	2,474.2	182.0 25%	2,495.9	12,479.3	857.6	13,336.9 10%	980.1	49.0	257.3	1,286.4	14,623.3
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1 25%	150.7	753.4	51.9	805.3 10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.6	222.1	3,348.0	4,009.7	439.6	133.9 30%	1,375.0	5,958.2	404.9	6,363.1 15%	667.4	33.4	210.2	911.0	7,274.1
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5 30%	451.6	1,957.0	135.1	2,092.1 15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.4	61.0	37.2	0.9 25%	24.8	123.9	8.6	132.5 10%	9.8	0.5	2.6	12.9	145.4
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6 25%	195.5	977.4	66.3	1,043.7 10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.7	2,925.2	4,046.8	1,078.9	111.3 25%	1,309.3	6,546.3	448.5	6,994.8 10%	512.6	25.6	134.6	672.8	7,667.6
	221.90	SEWAGE FACILITY	15.1	439.0	419.4	8.4	866.8	439.0	16.0 25%	330.5	1,652.3	114.3	1,766.6 10%	130.6	6.5	34.3	171.4	1,938.0
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1 30%	4,683.5	20,295.2	1,374.8	21,670.0 15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.7	0.0	5,186.5	5,210.2	23.7	194.5 25%	1,357.1	6,785.5	458.0	7,243.5 10%	523.4	26.2	137.4	687.0	7,930.5
	222.42	BATCH PLANT	10.2	296.2	0.5	1,273.0	1,569.7	296.2	47.8 25%	478.4	2,392.1	163.3	2,555.4 10%	186.6	9.3	49.0	244.9	2,800.3
4.3.2.2		TOTAL 220 - BALANCE OF PLANT	427.8	$12,406.0	$12,585.4	$30,359.2	$55,350.6	$12,406.0	$1,610.3	$19,099.8	$88,466.7	$6,048.8	$94,515.5	$8,489.8	$424.5	$2,498.7	$11,413.0	$105,928.5
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.8	159.1	35.6	348.5	153.8	7.3 30%	152.9	662.5	45.7	708.2 15%	75.3	3.8	23.7	102.8	811.0
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1,221.7	1,857.2	503.3	3,582.2	1,221.7	88.5 35%	1,712.3	6,604.7	454.0	7,058.7 20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.5	6,572.4	6,041.1	17,455.0	4,841.5	473.0 35%	7,969.3	30,738.8	2,107.0	32,845.8 20%	4,459.3	223.0	1,638.8	6,321.1	39,166.9
		TOTAL 230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8	$9,834.5	$38,006.0	$2,606.7	$40,612.7	$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0		GRAND TOTAL SURFACE FACILITIES	2,920.7	$84,489.0	$143,674.6	$87,510.4	$315,674.0	$84,489.0	$8,669.4	$128,336.1	$537,168.5	$36,808.5	$573,977.0	$65,646.3	$3,282.2	$23,587.4	$92,515.9	$666,492.9

DATE : 09-Nov-89

JOB 16039 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE B
($ 1,000 's - IIIQTR89)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	4	6	9	11	13	15	15	15	
BUSES AT $100.0 K per YEAR	COST	$200	$400	$600	$900	$1,100	$1,300	$1,500	$30,000	$1,500	$37,500
	SUBTOTAL - 100	$226	$426	$626	$1,160	$1,360	$1,560	$1,760	$35,200	$1,760	$44,078
CONTINGENCY @ 20%		$45	$85	$125	$232	$272	$312	$352	$7,040	$352	$8,816
	TOTAL - 100	$271	$511	$751	$1,392	$1,632	$1,872	$2,112	$42,240	$2,112	$52,894
210 - WASTE HANDLING FACILITIES											
LABOR:	# of PEOPLE	12	28	46	65	84	102	108	108	108	
COST PER YR/ PERSON $52,700	COST	$632	$1,476	$2,424	$3,426	$4,427	$5,375	$5,692	$113,832	$5,692	$142,975
OPERATING SUPPLIES @ 5.0% of LABOR		$32	$74	$121	$171	$221	$269	$285	$5,692	$285	$7,149
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$1,310	$1,310	$1,310	$7,860	$7,860	$7,860	$7,860	$157,200	$7,860	$200,430
Capital Cost = 262 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$1,342	$1,384	$1,431	$8,031	$8,081	$8,129	$8,145	$162,892	$8,145	$207,579
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	1	1	1	10	10	10	10	10	10	
@ $.05/Kwhr	COST	$50	$50	$50	$500	$500	$500	$500	$10,000	$500	$12,650
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$50	$52	$54	$301	$303	$305	$305	$6,108	$305	$7,784
	SUBTOTAL - 210	$2,074	$2,961	$3,959	$12,258	$13,311	$14,309	$14,642	$292,832	$14,642	$370,988
CONTINGENCY @ 40%		$830	$1,185	$1,584	$4,903	$5,324	$5,724	$5,857	$117,133	$5,857	$148,395
	TOTAL - 210	$2,904	$4,146	$5,543	$17,161	$18,636	$20,033	$20,498	$409,965	$20,498	$519,383
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	43	115	187	256	346	416	452	452	452	
COST PER YR/ PERSON $52,700	COST	$2,266	$6,061	$9,855	$13,491	$18,234	$21,923	$23,820	$476,408	$23,820	$595,879
OPERATING SUPPLIES @ 5.0% of LABOR		$113	$303	$493	$675	$912	$1,096	$1,191	$23,820	$1,191	$29,794
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$770	$770	$770	$3,080	$3,080	$3,080	$3,080	$61,600	$3,080	$79,310
Capital Cost = 154 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$883	$1,073	$1,263	$3,755	$3,992	$4,176	$4,271	$85,420	$4,271	$109,104
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.6	2.6	2.6	26	26	26	26	26	26	
@ $.05/Kwhr	COST	$130	$130	$130	$1,300	$1,300	$1,300	$1,300	$26,000	$1,300	$32,890
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$33	$40	$47	$141	$150	$157	$160	$3,203	$160	$4,091
	SUBTOTAL - 220	$3,313	$7,304	$11,295	$18,687	$23,676	$27,556	$29,552	$591,032	$29,552	$741,964
CONTINGENCY @ 30%		$994	$2,191	$3,388	$5,606	$7,103	$8,267	$8,865	$177,309	$8,865	$222,589
	TOTAL - 220	$4,306	$9,495	$14,683	$24,293	$30,778	$35,823	$38,417	$768,341	$38,417	$964,554
TOTAL ANNUAL O & M COST		$7,482	$14,152	$20,977	$42,846	$51,046	$57,727	$61,027	$1,220,546	$61,027	$1,536,830

DATE : 08-Nov-88

JOB 16039 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 8
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	8	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$800	$4,600	$100	$5,500	$1,000	$44,000
	SUBTOTAL - 100	$878	$6,394	$178	$7,450	$1,260	$52,788
CONTINGENCY @ 20%		$176	$1,279	$36	$1,490	$252	$10,558
	TOTAL - 100	$1,054	$7,673	$214	$8,940	$1,512	$63,346
210 - WASTE HANDLING FACILITIES							
LABOR:	# of PEOPLE	64	12	6		0	
COST PER YR/ PERSON $52,700	COST	$3,373	$14,545	$316	$18,234	$0	$161,209
OPERATING SUPPLIES @ 5.0% of LABOR		$169	$727	$16	$912	$0	$8,060
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$26	$603	$26	$655	$0	$201,085
Capital Cost = 262 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$195	$1,330	$42	$1,567	$0	$209,145
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$13,150
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$7	$50	$2	$59	$0	$7,843
	SUBTOTAL - 210	$3,595	$16,385	$380	$20,360	$0	$391,348
CONTINGENCY @ 40%		$1,438	$6,554	$152	$8,144	$0	$156,539
	TOTAL - 210	$5,033	$22,939	$532	$28,504	$0	$547,887
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	252	64	32		19	
COST PER YR/ PERSON $52,700	COST	$13,280	$77,574	$1,686	$92,541	$10,013	$698,433
OPERATING SUPPLIES @ 5.0% of LABOR		$664	$3,879	$84	$4,627	$501	$34,922
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$770	$17,710	$770	$19,250	$1,540	$100,100
Capital Cost = 154 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,434	$21,589	$854	$23,877	$2,041	$135,022
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$49,140
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$54	$810	$32	$895	$77	$5,063
	SUBTOTAL - 220	$15,318	$112,623	$3,123	$131,064	$14,630	$887,658
CONTINGENCY @ 30%		$4,595	$33,787	$937	$39,319	$4,389	$266,297
	TOTAL - 220	$19,914	$146,410	$4,060	$170,383	$19,019	$1,153,955
TOTAL ANNUAL O & M COST		$26,000	$177,021	$4,805	$207,826	$20,531	$1,765,188

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE B
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10% 82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE												
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10% 1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10% 245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE												
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.4	75%	100.4	505.8	35%	177.0	10% 68.3	0.0	(0.1)	751.0
	120.70	ON SITE - DRAINAGE CONTROL		0.0												
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10% 9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10% 48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10% 1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9	$457.9	$0.0	$0.9	$5,037.0
	130.11	OFF SITE - ROADS (NEW)														
	130.13	OFF SITE - BRIDGES														
	130.21	OFF SITE - RAIL (NEW)														
	130.50	OFF SITE - UTILITIES														
	140.00	MONUMENTS														
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
4.3.1		TOTAL 100 - SITE	60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9	$457.9	$0.0	$0.9	$5,037.0
	211.02	MHB I - BUILDING/STRUCTURES														
	211.03	MHB I - HOT CELL EQUIPMENT														
	211.04	MHB I - UTILITIES														
	211.05	MHB I - HVAC EQUIPMENT														
	211.06	MHB I - HANDL/PACK EQUIP														
	211.07	MHB I - SUPPORT FACILITIES														
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	118.5	3,072.3	19.4	80.0	3,171.7	75%	2,304.2	5,475.9	35%	1,916.6	10% 739.3	813.2	(0.5)	8,944.5
	212.03	MHB II - HOT CELL EQUIP		INCLUDED ABOVE												
	212.04	MHB II - UTILITIES		INCLUDED ABOVE												
	212.05	MHB II - HVAC EQUIPMENT		INCLUDED ABOVE												
	212.06	MHB II - HANDL/PACK EQUIP		INCLUDED ABOVE												
	212.07	MHB II - SUPPORT FAC.		INCLUDED ABOVE												
		SUBTOTAL 212 - MHB II	118.5	$3,072.3	$19.4	$80.0	$3,171.7		$2,304.2	$5,475.9		$1,916.6	$739.3	$813.2	($0.5)	$8,944.5
	215.01	WASTE TREATMENT BUILDING	18.2	479.8	10.0	187.1	676.9	75%	359.9	1,036.8	35%	362.9	10% 140.0	154.0	0.3	1,694.0
	215.02	VEHICLE WASH FACILITY	0.9	23.7	0.0	0.0	23.7	75%	17.8	41.5	35%	14.5	10% 5.6	6.2	0.2	68.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10% 21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10% 179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	44.1	$1,162.6	$20.7	$512.1	$1,695.4		$872.0	$2,567.4		$898.6	$346.7	$381.3	$0.1	$4,194.1
4.3.2.1		TOTAL 210 - WASTE HANDLING FAC.	162.6	$4,234.9	$40.1	$592.1	$4,867.1		$3,176.2	$8,043.3		$2,815.2	$1,086.0	$1,194.5	($0.4)	$13,138.6

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 8
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10% 15.6	17.1	0.6	189.0
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10% 12.5	13.7	0.3	151.0
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10% 19.9	21.9	(0.2)	241.0
	220.40	MAINTENANCE FACILITIES	8.1	213.5	0.0	0.0	213.5	75%	160.2	373.7	35%	130.8	10% 50.5	55.5	(0.5)	610.0
	220.50	ADMIN/PERSONNEL FACILITIES	12.6	332.2	0.0	0.0	332.2	75%	249.1	581.3	35%	203.4	10% 78.5	86.3	0.5	950.0
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10% 25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10% 49.8	54.8	0.1	603.0
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10% 6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10% 13.1	14.4	(0.3)	158.0
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10% 17.4	19.2		211.0
	221.10	EXPLOSIVE MAGAZINES	0.2	5.3	0.0	0.0	5.3	75%	4.0	9.3	35%	3.2	10% 1.2	1.4	(0.1)	15.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10% 2.1	2.3	0.3	26.0
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10% 23.7	26.0	(0.3)	286.0
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10% 12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10% 28.7	31.5	0.2	347.0
	222.30	STANDARD EQUIPMENT		0.0												
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10% 10.2	11.3		124.0
4.3.2.2	TOTAL	220 - BALANCE OF PLANT	58.7	$1,547.5	$0.0	$0.0	$1,547.5		$1,176.7	$2,724.2		$953.4	$367.7	$404.5	$1.0	$4,450.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10% 7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10% 48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10% 168.2	185.0	0.3	2,035.2
	TOTAL	230 - SURFACE SHAFT FAC.	35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8	$223.7	$246.0	$0.2	$2,706.1
4.0	GRAND	TOTAL SURFACE FACILITIES	318.1	$8,336.6	$311.7	$592.1	$9,240.4		$6,574.9	$15,815.3		$5,535.3	$2,135.3	$1,845.0	$1.7	$25,332.6

03-Nov-88

MRS SYSTEM STUDY - CASE 8
IMPLACEMENT CONTAINER COST ESTIMATE (MID 1988 DOLLARS)
C:\LOTUS\CONT_C8 REVISION "C"

WASTE TYPE	DESIGN NUMBER	NUMBER of CONTAINERS	UNIT PRICE	EXTENTION ($1000s)	CONTINGENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	0	$0	$0	INCLUDED	$0
DHLW	DHLW	0	$0	$0	INCLUDED	$0
INTACT PWR		0	$0	$0	INCLUDED	$0
INTACT PWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED PWR		0	$0	$0	INCLUDED	$0
INTACT BWR and/or PWR/BWR MIXED		0	$0	$0	INCLUDED	$0
INTACT BWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED BWR		0	$0	$0	INCLUDED	$0
PWR HARDWARE		0	$0	$0	INCLUDED	$0
BWR HARDWARE		0	$0	$0	INCLUDED	$0
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		228		$6,384	$0	$6,384
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		540		$15,120	$0	$15,120
CONTACT HANDLED WASTE						$16,000
						$31,120

MRS STUDY CASES 8 AND 9
MANAGEMENT AND INTEGRATION COST ESTIMATE - UNDERGROUND FACILITIES
task:2605A138
FILE = ENG-8M9M.WK1 (RANGE=MGTINT)
06-Oct-88 02:48 PM

All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$37,107			
		EMPLACEMENT		$19,348			
		CARETAKER		$3,123			
		CLOSURE					$11,686
				$59,578	$0	$0	$11,686
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$14,894	$0	$0	$2,921
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $318,045 =====>		$22,263			
		of which	85%	$18,924 is labor			
		and	15%	$3,339 is materials and equipment.			
		Labor converts to at $100k per FTE.		189.24 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			25,867,800 from p.21	5,105,100 from p.28 of prj2rpt	
		CONSULTANT COST			$1,423	$281	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)		DURATION		24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)		PERSONS		539	106	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.		40 PER BUS		$32,335	$6,913	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$549.88	$0.00	$25.72	$575.60
State Sales Tax	0.00	$0.00	$37.87	$33.12	$70.99
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.53	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.54	$461.19
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.92	$337.99
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.12
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$43.33	$2,772.89
State Sales Tax	0.00	$0.00	$71.22	$55.79	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.17
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$9.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.36	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.99	$243.68
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.64	$356.54
State Sales Tax	0.00	$0.00	$18.80	$35.59	$54.39
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.97	$0.00	$1.29	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
			(All costs in thousands of dollars)		
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.32	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.68	$0.00	$15.85	$200.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.89
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	172.35	$4,772.57	$5,472.90	$3,485.47	$13,730.94
Ind. Labor & Material	56.88	$1,574.65	$0.00	$104.56	$1,679.51
State Sales Tax	0.00	$0.00	$205.23	$134.63	$339.86
QA/QC Impact	11.46	$317.38	$273.65	$179.50	$770.53
	240.69	$6,664.90	$5,951.78	$3,904.16	$16,520.84
Labor Contingency	60.17		Contractor Cost (0.15)		$2,478.13
			Contingency (0.25)		$4,749.75
Task 41024 Total	300.87				$23,748.72
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	77.76	$2,071.00	$6,840.60	$2,017.48	$10,929.08
Ind. Labor & Material	24.68	$683.43	$0.00	$60.52	$743.95
State Sales Tax	0.00	$0.00	$256.53	$77.92	$334.45
QA/QC Impact	4.97	$137.72	$342.02	$103.90	$583.64
	104.45	$2,892.15	$7,439.15	$2,259.82	$12,591.12
Labor Contingency	36.56		Contractor Cost (0.15)		$1,888.67
			Contingency (0.35)		$5,067.93
Task 41025 Total	141.01				$19,547.72
Subject 41020 Total	730.77				$76,914.21
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	3.26	$90.29	$1,767.04	$87.96	$1,945.29
Ind. Labor & Material	1.08	$29.80	$0.00	$2.64	$32.44
State Sales Tax	0.00	$0.00	$68.27	$5.40	$73.67
QA/QC Impact	0.22	$6.00	$88.35	$4.53	$98.88
	4.55	$126.09	$1,921.66	$98.53	$2,146.28
Labor Contingency	1.59		Contractor Cost (0.15)		$321.94
			Contingency (0.35)		$863.88
Task 41045 Total	6.15				$3,332.10
Subject 41040 Total	6.15				$3,332.10
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	67.90	$1,869.91	$3,327.06	$2,121.39	$7,318.36
Ind. Labor & Material	20.43	$617.07	$0.00	$63.64	$680.71
State Sales Tax	0.00	$0.00	$124.76	$81.94	$206.70
QA/QC Impact	4.12	$124.35	$166.36	$109.25	$399.96
	86.44	$2,611.33	$3,618.18	$2,376.22	$8,605.73
Labor Contingency	25.93		Contractor Cost (0.15)		$1,290.86
			Contingency (0.30)		$3,968.98
Task 41060 Total	112.37				$12,865.57
Subject 41060 Total	112.37				$12,865.57
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	61.60	$1,705.62	$3,381.54	$112.73	$5,199.89
Ind. Labor & Material	20.33	$566.85	$0.00	$3.38	$566.23
State Sales Tax	0.00	$0.00	$126.80	$4.35	$131.15
QA/QC Impact	4.10	$113.42	$169.08	$5.81	$288.31
	86.02	$2,381.89	$3,677.42	$126.27	$6,185.58
Labor Contingency	21.51		Contractor Cost (0.15)		$927.83
			Contingency (0.25)		$1,778.36
Task 41070 Total	107.53				$8,891.77
Subject 41070 Total	107.53				$8,891.77
Category 41000 Total	1139.84				$122,830.86

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.98	$0.00	$3.26	$15.27
State Sales Tax	0.00	$0.00	$227.97	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54		Contractor Cost (0.15)		$1,017.73
			Contingency (0.35)		$2,730.92
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00		Contractor Cost (0.15)		$608.86
			Contingency (0.35)		$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$1,982.89	$0.00	$1,982.89
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$74.36	$0.00	$74.36
QA/QC Impact	0.00	$0.00	$99.14	$0.00	$99.14
	0.00	$0.00	$2,156.39	$0.00	$2,156.39
Labor Contingency	0.00		Contractor Cost (0.15)		$323.75
			Contingency (0.35)		$867.24
Task 42030 Total	0.00				$3,347.78
Subject 42030 Total	0.00				$3,347.78
Category 42000 Total	2.09				$20,183.05
Area 40000 Total	1141.93				$143,013.91
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.65	$1,074.85
State Sales Tax	0.00	$0.00	$37.14	$2.97	$40.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55		Contractor Cost (0.15)		$882.42
			Contingency (0.25)		$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$83.84	$83.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00		Contractor Cost (0.15)		$469.57
			Contingency (0.25)		$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	500.98	$16,049.75	$2,167.46	$1,105.35	$19,322.56
Ind. Labor & Material	165.32	$5,298.42	$0.00	$33.16	$5,329.58
State Sales Tax	0.00	$0.00	$81.28	$42.69	$123.97
QA/QC Impact	33.32	$1,067.31	$108.38	$56.93	$1,232.62
	699.62	$22,413.48	$2,357.12	$1,238.13	$26,008.73
Labor Contingency	209.89		Contractor Cost (0.15)		$3,901.31
			Contingency (0.30)		$8,973.01
Task 51031 Total	909.51				$38,883.05
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04		Contractor Cost (0.15)		$100.22
			Contingency (0.30)		$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	918.34				$39,882.56
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.78	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.64	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68		Contractor Cost (0.15)		$341.54
			Contingency (0.25)		$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	10.90	$301.77	$19.68	$208.18	$529.63
Ind. Labor & Material	3.60	$99.58	$0.00	$6.25	$105.83
State Sales Tax	0.00	$0.00	$0.74	$8.04	$8.78
QA/QC Impact	0.72	$20.07	$0.98	$10.72	$31.77
	15.22	$421.42	$21.40	$233.19	$676.01
Labor Contingency	4.57		Contractor Cost (0.15)		$101.40
			Contingency (0.30)		$233.22
Task 51050 Total	19.78				$1,010.63
Subject 51050 Total	19.78				$1,010.63
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	64.41	$1,783.54	$1,457.52	$539.73	$3,780.79
Ind. Labor & Material	21.26	$588.57	$0.00	$16.19	$604.76
State Sales Tax	0.00	$0.00	$54.65	$20.85	$75.50
QA/QC Impact	4.28	$118.61	$72.88	$27.80	$219.29
	89.95	$2,490.72	$1,585.05	$604.57	$4,680.34
Labor Contingency	26.98		Contractor Cost (0.15)		$702.05
			Contingency (0.30)		$1,614.71
Task 51060 Total	116.93				$6,997.10
Subject 51060 Total	116.93				$6,997.10
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.91	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52		Contractor Cost (0.15)		$122.49
			Contingency (0.25)		$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55		Contractor Cost (0.15)		$21.97
			Contingency (0.25)		$89.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76		Contractor Cost (0.15)		$163.45
			Contingency (0.25)		$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09		Contractor Cost (0.15)		$817.26
			Contingency (0.30)		$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.68	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34		Contractor Cost (0.15)		$189.95
			Contingency (0.25)		$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1473.78				$77,324.06
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$409.64	$0.00	$20.10	$430.04
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.84	$31.63	$0.00	$0.59	$32.22
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.52
			Contingency (0.30)		$56.39
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$119.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.67	$824.62
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.99
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1686.51				$100,034.73

* TOTAL LABOR HOURS AND COST FOR 3523.84 x 10^3 man-hrs $318,044.90 PHASE 1 OF PROJECT.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$116.85	$2,979.45
State Sales Tax	0.00	$0.00	$25.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.34
			Contingency (0.30)		$5,934.78
Task 23011 Total	481.02				$25,717.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.62	$3.25
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$56.77	$549.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$38.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$250.73
			Contingency (0.25)		$442.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.61	$214.62
State Sales Tax	0.00	$0.00	$7.66	$16.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$442.22
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$130.55	$187.88
QA/QC Impact	7.94	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68		Contractor Cost (0.15)		$1,506.33
			Contingency (0.25)		$2,887.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.15	$3,922.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86		Contractor Cost (0.15)		$4,910.56
			Contingency (0.25)		$9,411.91
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.67	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87		Contractor Cost (0.15)		$2,263.30
			Contingency (0.25)		$4,387.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	1792.65	$49,639.36	$11,184.96	$36,252.30	$97,076.62
Ind. Labor & Material	591.58	$16,380.69	$0.00	$1,087.57	$17,468.26
State Sales Tax	0.00	$0.00	$419.44	$1,400.25	$1,819.69
QA/QC Impact	119.21	$3,301.02	$559.25	$1,866.99	$5,727.26
	2503.44	$69,321.37	$12,163.65	$40,607.11	$122,092.13
Labor Contingency	625.86		Contractor Cost (0.15)		$18,313.81
			Contingency (0.25)		$35,101.49
Task 41024 Total	3129.30				$175,507.43
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1192.68	$33,217.56	$28,407.83	$32,359.08	$93,984.47
Ind. Labor & Material	395.89	$10,961.79	$0.00	$370.77	$11,332.56
State Sales Tax	0.00	$0.00	$1,065.29	$1,248.87	$2,315.16
QA/QC Impact	79.78	$2,208.97	$1,420.39	$1,666.49	$5,295.85
	1675.33	$46,388.32	$30,893.51	$36,246.21	$113,528.04
Labor Contingency	586.37		Contractor Cost (0.15)		$17,029.20
			Contingency (0.35)		$45,695.03
Task 41025 Total	2261.70				$176,252.27
Subject 41020 Total	6598.06				$436,190.82
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33		Contractor Cost (0.15)		$8,851.18
			Contingency (0.35)		$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	65.20	$1,805.27	$1,533.83	$1,794.73	$5,133.83
Ind. Labor & Material	21.52	$595.74	$0.00	$53.84	$649.58
State Sales Tax	0.00	$0.00	$57.52	$69.32	$126.84
QA/QC Impact	4.34	$120.05	$76.70	$92.43	$289.18
	91.05	$2,521.06	$1,668.05	$2,010.32	$6,199.43
Labor Contingency	31.87		Contractor Cost (0.15)		$925.92
			Contingency (0.35)		$2,499.27
Task 41045 Total	122.92				$9,624.62
Subject 41040 Total	122.92				$9,624.62
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	170.18	$5,127.43	$9,718.69	$3,067.73	$17,913.85
Ind. Labor & Material	56.16	$1,692.05	$0.00	$92.03	$1,784.08

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$364.45	$118.49	$482.94
QA/QC Impact	11.32	$340.97	$485.94	$157.99	$984.90
	237.65	$7,160.45	$10,569.08	$3,436.24	$21,165.77
Labor Contingency	71.30		Contractor Cost (0.15)		$3,174.87
			Contingency (0.30)		$7,302.19
Task 41060 Total	308.95				$31,642.83
Subject 41060 Total	308.95				$31,642.83
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	720.00	$19,937.28	$6,786.00	$9,501.84	$36,225.12
Ind. Labor & Material	237.60	$6,579.30	$0.00	$285.06	$6,864.36
State Sales Tax	0.00	$0.00	$254.48	$367.01	$621.49
QA/QC Impact	47.88	$1,325.83	$339.30	$489.34	$2,154.47
	1005.48	$27,842.41	$7,379.78	$10,643.25	$45,865.44
Labor Contingency	251.37		Contractor Cost (0.15)		$6,879.81
			Contingency (0.25)		$13,186.31
Task 41070 Total	1256.85				$65,931.56
Subject 41070 Total	1256.85				$65,931.56
Category 41000 Total	9437.48				$634,999.47
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	268.52	$8,791.48	$31,649.46	$26,608.42	$67,049.36
Ind. Labor & Material	88.61	$2,901.19	$0.00	$798.25	$3,699.44
State Sales Tax	0.00	$0.00	$1,186.86	$1,027.75	$2,214.61
QA/QC Impact	17.86	$584.63	$1,582.47	$1,370.33	$3,537.43
	374.99	$12,277.30	$34,418.79	$29,804.75	$76,500.84
Labor Contingency	131.25		Contractor Cost (0.15)		$11,475.12
			Contingency (0.35)		$30,791.56
Task 42010 Total	506.24				$118,767.55
Subject 42010 Total	506.24				$118,767.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.52	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.74	$1,935.98
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	14.71	$481.48	$1,733.34	$1,457.26	$3,672.08
Ind. Labor & Material	4.85	$158.89	$0.00	$43.72	$202.61
State Sales Tax	0.00	$0.00	$65.00	$56.26	$121.29
QA/QC Impact	0.98	$32.02	$86.66	$75.05	$193.73
	20.54	$672.39	$1,885.00	$1,632.32	$4,189.71
Labor Contingency	7.19		Contractor Cost (0.15)		$628.45
			Contingency (0.35)		$1,686.36
Task 42030 Total	27.73				$6,504.52
Subject 42030 Total	27.73				$6,504.52
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.92	$95.60	$0.00	$0.00	$95.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	816.19				$189,216.99
Area 40000 Total	10253.67				$824,216.46
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	222.37	$6,157.78	$0.00	$341.33	$6,499.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.57
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3138.52	$100,722.58	$4,300.61	$6,403.89	$111,427.08
Ind. Labor & Material	1035.71	$33,238.45	$0.00	$192.12	$33,430.57
State Sales Tax	0.00	$0.00	$161.28	$247.35	$408.63
QA/QC Impact	208.71	$6,698.05	$215.03	$329.80	$7,242.88

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	4382.95	$140,659.08	$4,676.92	$7,173.16	$152,509.16
Labor Contingency	1314.89			Contractor Cost (0.15)	$22,876.37
				Contingency (0.30)	$52,615.66
Task 51031 Total	5697.84				$228,001.19
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$49.05	$130.94	$179.99
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.96
Labor Contingency	686.05			Contractor Cost (0.15)	$11,804.70
				Contingency (0.30)	$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	8670.74				$345,654.66
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.49	$32.65	$47.14
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
Labor Contingency	86.84			Contractor Cost (0.15)	$1,647.73
				Contingency (0.25)	$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	283.06	$7,838.05	$1,378.01	$2,905.45	$12,121.51
Ind. Labor & Material	93.41	$2,586.56	$0.00	$87.16	$2,673.72
State Sales Tax	0.00	$0.00	$51.68	$112.22	$163.90
QA/QC Impact	18.82	$521.23	$68.90	$149.63	$739.76
	395.30	$10,945.84	$1,498.59	$3,254.46	$15,698.89
Labor Contingency	118.59			Contractor Cost (0.15)	$2,354.84
				Contingency (0.30)	$5,416.12
Task 51050 Total	513.88				$23,469.85
Subject 51050 Total	513.88				$23,469.85
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	367.44	$10,174.44	$6,507.66	$2,816.81	$19,498.91
Ind. Labor & Material	121.26	$3,357.57	$0.00	$84.50	$3,442.07
State Sales Tax	0.00	$0.00	$244.04	$108.80	$352.84
QA/QC Impact	24.43	$676.60	$325.38	$145.07	$1,147.05
	513.13	$14,208.61	$7,077.08	$3,155.18	$24,440.87
Labor Contingency	153.94			Contractor Cost (0.15)	$3,666.14
				Contingency (0.30)	$8,432.10
Task 51060 Total	667.07				$36,539.11
Subject 51060 Total	667.07				$36,539.11
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.25	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$94.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
Labor Contingency	9.79			Contractor Cost (0.15)	$755.49
				Contingency (0.25)	$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.31	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
Labor Contingency	0.54			Contractor Cost (0.15)	$92.60
				Contingency (0.25)	$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
Labor Contingency	0.95			Contractor Cost (0.15)	$426.70
				Contingency (0.25)	$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.96	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47		Contractor Cost (0.15)		$3,063.79
			Contingency (0.30)		$7,022.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax	0.00	$0.00	$0.18	$26.82	$27.02
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73		Contractor Cost (0.15)		$2,075.07
			Contingency (0.25)		$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	12724.55				$527,787.09
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64		Contractor Cost (0.15)		$2,153.85
			Contingency (0.25)		$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.64	$2.92	$3.56
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46		Contractor Cost (0.15)		$159.64
			Contingency (0.30)		$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72		Contractor Cost (0.15)		$538.81
			Contingency (0.30)		$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.42	$0.00	$11.14	$141.56
State Sales Tax	0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact	0.95	$26.28	$1.97	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98		Contractor Cost (0.15)		$151.61
			Contingency (0.30)		$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.57	$10,365.32	$0.00	$543.04	$10,908.36
State Sales Tax	0.00	$0.00	$300.65	$699.16	$999.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37		Contractor Cost (0.15)		$10,928.80
			Contingency (0.35)		$29,325.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	14862.08				$670,013.43

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 25867.80 x 10^3 man-hrs $1,535,700.27

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$64.02	$1,614.60
State Sales Tax	0.00	$0.00	$21.68	$82.42	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$2,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$2.67	$40.29
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$39.83	$574.15
State Sales Tax	0.00	$0.00	$12.45	$51.29	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.32	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.25
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	416.00	$11,519.04	$3,642.21	$7,832.76	$22,994.01
Ind. Labor & Material	137.28	$3,801.28	$0.00	$234.98	$4,036.26
State Sales Tax	0.00	$0.00	$136.58	$302.54	$439.12
QA/QC Impact	27.66	$766.02	$182.11	$403.39	$1,351.52
	580.94	$16,086.34	$3,960.90	$8,773.67	$28,820.91
Labor Contingency	145.24		Contractor Cost (0.15)		$4,323.14
			Contingency (0.25)		$8,286.02
Task 41070 Total	726.18				$41,430.07
Subject 41070 Total	726.18				$41,430.07
Category 41000 Total	726.18				$41,430.07
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.43
			Contingency (0.40)		$700.53
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	749.85				$43,881.92
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.64	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$36.58	$57.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.72	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.84	$22.05
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.45
			Contingency (0.30)		$2,080.24
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency	10.17		Contractor Cost (0.15)		$176.84
			Contingency (0.25)		$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	101.96	$2,823.30	$1,026.22	$678.79	$4,528.31
Ind. Labor & Material	33.65	$931.69	$0.00	$20.36	$952.05
State Sales Tax	0.00	$0.00	$38.48	$26.22	$64.70
QA/QC Impact	6.78	$187.75	$51.32	$34.96	$274.03
	142.39	$3,942.74	$1,116.02	$760.33	$5,819.09
Labor Contingency	42.72		Contractor Cost (0.15)		$872.87
			Contingency (0.30)		$2,007.59
Task 51050 Total	185.10				$8,699.55
Subject 51050 Total	185.10				$8,699.55
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$35.53	$313.12
State Sales Tax	0.00	$0.00	$101.90	$43.75	$145.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency	10.60		Contractor Cost (0.15)		$818.45
			Contingency (0.25)		$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.69	$0.00	$0.47	$9.13
State Sales Tax	0.00	$0.00	$13.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency	0.29		Contractor Cost (0.15)		$62.26
			Contingency (0.25)		$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency	1.03		Contractor Cost (0.15)		$182.30
			Contingency (0.25)		$349.40
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.09	$2,319.59	$0.00	$51.70	$2,371.28
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency	88.99		Contractor Cost (0.15)		$1,956.04
			Contingency (0.30)		$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency	127.54		Contractor Cost (0.15)		$2,248.00
			Contingency (0.25)		$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2688.47				$114,249.13
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.06	$22.44	$136.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency	18.15		Contractor Cost (0.15)		$964.92
			Contingency (0.25)		$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	6.82	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47			Contractor Cost (0.15)	$230.34
				Contingency (0.30)	$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79			Contractor Cost (0.15)	$1,264.46
				Contingency (0.30)	$2,908.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.39	$0.00	$241.67	$5,259.06
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44			Contractor Cost (0.15)	$5,472.21
				Contingency (0.35)	$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3801.12				$195,031.76

* TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT. 5105.15 x 10^3 man-hrs $270,302.38 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	99.36	$3,252.96	$250.13	$1,460.61	$4,963.70
Ind. Labor & Material	32.79	$1,073.48	$0.00	$43.82	$1,117.30
State Sales Tax	0.00	$0.00	$52.38	$13.42	$65.80
QA/QC Impact	6.61	$216.32	$12.51	$75.22	$304.05
	138.76	$4,542.76	$272.02	$1,636.07	$6,450.85
Labor Contingency	41.63		Contractor Cost (0.15)		$967.64
			Contingency (0.30)		$2,225.55
Task 23011 Total	180.38				$9,644.04
Subject 23010 Total	180.38				$9,644.04
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.51		Contractor Cost (0.15)		$13.58
			Contingency (0.30)		$31.23
Task 23085 Total	2.19				$135.31
Subject 23080 Total	2.19				$135.31
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.42		Contractor Cost (0.15)		$13.58
			Contingency (0.25)		$26.02
Task 23105 Total	2.11				$130.10
Subject 23100 Total	2.11				$130.10
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.07	$35.08	$5.63	$22.62	$63.33
Ind. Labor & Material	0.35	$11.58	$0.00	$0.68	$12.26
State Sales Tax	0.00	$0.00	$0.21	$0.87	$1.08
QA/QC Impact	0.07	$2.33	$0.28	$1.17	$3.78
	1.50	$48.99	$6.12	$25.34	$80.45
Labor Contingency	0.37		Contractor Cost (0.15)		$12.07
			Contingency (0.25)		$22.13
Task 23115 Total	1.87				$115.65
Subject 23110 Total	1.87				$115.65
Category 23000 Total	186.55				$10,025.10
Area 20000 Total	186.55				$10,025.10
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	15.18	$420.35	$86.18	$344.71	$851.24
Ind. Labor & Material	5.01	$138.72	$0.00	$10.34	$149.06
State Sales Tax	0.00	$0.00	$3.23	$13.31	$16.54
QA/QC Impact	1.01	$27.95	$4.31	$17.75	$50.01
	21.20	$587.02	$93.72	$386.11	$1,066.85
Labor Contingency	6.36		Contractor Cost (0.15)		$160.03
			Contingency (0.30)		$368.07
Task 30010 Total	27.56				$1,594.95
Subject 30010 Total	27.56				$1,594.95
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	8.22	$227.53	$46.66	$186.65	$460.84
Ind. Labor & Material	2.71	$75.08	$0.00	$5.60	$80.68
State Sales Tax	0.00	$0.00	$1.75	$7.21	$8.96
QA/QC Impact	0.55	$15.13	$2.33	$9.61	$27.07
	11.48	$317.74	$50.74	$209.07	$577.55
Labor Contingency	3.44		Contractor Cost (0.15)		$86.63
			Contingency (0.30)		$199.25
Task 30080 Total	14.92				$863.43
Subject 30080 Total	14.92				$863.43
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.10	$113.64	$23.29	$93.18	$230.11
Ind. Labor & Material	1.35	$37.50	$0.00	$2.80	$40.30
State Sales Tax	0.00	$0.00	$0.87	$3.60	$4.47
QA/QC Impact	0.27	$7.56	$1.16	$4.80	$13.52
	5.73	$158.70	$25.32	$104.38	$288.40
Labor Contingency	1.43		Contractor Cost (0.15)		$43.27
			Contingency (0.25)		$82.63
Task 30106 Total	7.16				$414.60
Subject 30100 Total	7.16				$414.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	3.65	$101.01	$20.71	$82.83	$204.55
Ind. Labor & Material	1.20	$33.33	$0.00	$2.48	$35.81
State Sales Tax	0.00	$0.00	$0.78	$2.20	$3.08
QA/QC Impact	0.24	$6.72	$1.04	$4.27	$12.03
	5.09	$141.06	$22.53	$92.78	$256.37
Labor Contingency	1.27		Contractor Cost (0.15)		$38.45
			Contingency (0.25)		$73.72
Task 30116 Total	6.37				$368.54
Subject 30110 Total	6.37				$368.54
Category 30000 Total	56.01				$3,241.52
Area 30000 Total	56.01				$3,241.52
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	162.00	$4,485.60	$2,282.85	$637.20	$7,405.65
Ind. Labor & Material	53.46	$1,480.25	$0.00	$19.12	$1,499.37
State Sales Tax	0.00	$0.00	$85.61	$24.61	$110.22
QA/QC Impact	10.77	$298.29	$114.14	$32.82	$445.25
	226.23	$6,264.14	$2,482.60	$713.75	$9,460.49
Labor Contingency	56.56		Contractor Cost (0.15)		$1,419.08
			Contingency (0.25)		$2,719.90
Task 41070 Total	282.79				$13,599.47
Subject 41070 Total	282.79				$13,599.47
Category 41000 Total	282.79				$13,599.47
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$6.83	$222.88
State Sales Tax	0.00	$0.00	$24.75	$8.79	$33.54
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33		Contractor Cost (0.15)		$11.20
			Contingency (0.40)		$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	610.18	$17,067.67	$15,606.11	$9,658.09	$42,331.87
Ind. Labor & Material	201.36	$5,632.33	$0.00	$289.74	$5,922.07
State Sales Tax	0.00	$0.00	$585.22	$373.04	$958.26
QA/QC Impact	40.58	$1,135.00	$780.31	$497.39	$2,412.70
	852.11	$23,835.00	$16,971.64	$10,818.26	$51,624.90
Labor Contingency	340.84		Contractor Cost (0.15)		$7,743.74
			Contingency (0.40)		$23,747.45
Task 43300 Total	1192.96				$83,116.09
Subject 43300 Total	1192.96				$83,116.09
Category 43000 Total	1395.03				$94,092.91
Area 40000 Total	1677.82				$107,692.38
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	180.35	$4,994.18	$724.73	$370.64	$6,089.55
Ind. Labor & Material	59.51	$1,648.08	$0.00	$11.12	$1,659.20
State Sales Tax	0.00	$0.00	$27.18	$14.32	$41.50
QA/QC Impact	11.99	$332.11	$36.24	$19.09	$387.44
	251.86	$6,974.37	$788.15	$415.17	$8,177.69
Labor Contingency	62.96		Contractor Cost (0.15)		$1,226.66
			Contingency (0.25)		$2,351.09
Task 51011 Total	314.82				$11,755.44
Subject 51010 Total	314.82				$11,755.44
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	291.47	$9,343.50	$793.81	$644.80	$10,782.11
Ind. Labor & Material	96.19	$3,083.36	$0.00	$19.34	$3,102.70
State Sales Tax	0.00	$0.00	$29.77	$24.91	$54.68
QA/QC Impact	19.38	$621.34	$39.69	$33.21	$694.24
	407.04	$13,048.20	$863.27	$722.26	$14,633.73
Labor Contingency	122.11		Contractor Cost (0.15)		$2,195.07
			Contingency (0.30)		$5,048.63
Task 51031 Total	529.16				$21,877.43
Subject 51030 Total	529.16				$21,877.43
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	92.43	$2,559.53	$153.95	$340.84	$3,054.32
Ind. Labor & Material	30.50	$844.64	$0.00	$10.23	$854.87
State Sales Tax	0.00	$0.00	$5.78	$13.17	$18.95
QA/QC Impact	6.15	$170.21	$7.70	$17.55	$195.46
	129.09	$3,574.38	$167.43	$381.79	$4,123.60
Labor Contingency	32.27		Contractor Cost (0.15)		$618.54
			Contingency (0.25)		$1,185.54
Task 51040 Total	161.36				$5,927.68
Subject 51040 Total	161.36				$5,927.68
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	149.96	$4,152.46	$4,239.96	$3,155.52	$11,547.94
Ind. Labor & Material	49.48	$1,370.31	$0.00	$67.27	$1,437.58
State Sales Tax	0.00	$0.00	$158.99	$121.88	$280.87
QA/QC Impact	9.97	$276.14	$212.00	$162.51	$650.65
	209.42	$5,798.91	$4,610.95	$3,534.58	$13,944.44
Labor Contingency	62.83		Contractor Cost (0.15)		$2,091.67
			Contingency (0.30)		$4,810.84
Task 51050 Total	272.25				$20,846.95
Subject 51050 Total	272.25				$20,846.95
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	10.51	$291.18	$940.56	$409.97	$1,641.71
Ind. Labor & Material	3.47	$96.09	$0.00	$12.30	$108.39
State Sales Tax	0.00	$0.00	$55.28	$15.84	$71.12
QA/QC Impact	0.70	$19.36	$47.02	$21.11	$87.49
	14.68	$406.63	$1,022.86	$459.22	$1,888.71
Labor Contingency	3.67		Contractor Cost (0.15)		$283.31
			Contingency (0.25)		$543.00
Task 51070 Total	18.35				$2,715.02
Subject 51070 Total	18.35				$2,715.02
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.58	$18.86	$185.29	$3.28	$207.43
Ind. Labor & Material	0.19	$6.22	$0.00	$0.10	$6.32
State Sales Tax	0.00	$0.00	$6.95	$0.13	$7.08
QA/QC Impact	0.04	$1.25	$9.27	$0.17	$10.69

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.80	$26.33	$201.51	$3.68	$231.52
Labor Contingency	0.20		Contractor Cost (0.15)		$34.72
			Contingency (0.25)		$66.56
Task 51080 Total	1.01				$332.80
Subject 51080 Total	1.01				$332.80
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.51	$17.46	$820.67	$101.95	$940.08
Ind. Labor & Material	0.17	$5.76	$0.00	$3.06	$8.82
State Sales Tax	0.00	$0.00	$30.78	$3.94	$34.72
QA/QC Impact	0.03	$1.16	$41.03	$5.25	$47.44
	0.72	$24.38	$892.48	$114.20	$1,031.06
Labor Contingency	0.18		Contractor Cost (0.15)		$154.66
			Contingency (0.25)		$296.43
Task 51090 Total	0.89				$1,482.15
Subject 51090 Total	0.89				$1,482.15
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	117.76	$3,868.51	$705.29	$719.47	$5,293.27
Ind. Labor & Material	38.86	$1,276.61	$0.00	$21.58	$1,298.19
State Sales Tax	0.00	$0.00	$26.45	$27.78	$54.22
QA/QC Impact	7.83	$257.26	$35.26	$37.05	$329.57
	164.45	$5,402.38	$767.00	$805.89	$6,975.27
Labor Contingency	49.34		Contractor Cost (0.15)		$1,046.30
			Contingency (0.30)		$2,406.47
Task 51100 Total	213.79				$10,428.04
Subject 51100 Total	213.79				$10,428.04
Category 51000 Total	1511.62				$75,365.51
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	37.20	$1,267.40	$5,120.52	$265.88	$6,653.80
Ind. Labor & Material	12.28	$418.24	$0.00	$7.98	$426.22
State Sales Tax	0.00	$0.00	$192.02	$10.27	$202.56
QA/QC Impact	2.47	$84.28	$256.03	$13.69	$354.00
	51.95	$1,769.92	$5,568.57	$297.82	$7,636.31
Labor Contingency	12.99		Contractor Cost (0.15)		$1,145.22
			Contingency (0.25)		$2,195.25
Task 52010 Total	64.94				$10,977.20
Subject 52010 Total	64.94				$10,977.20
52020 Communications					
52020 Communications					
Direct Cost	5.33	$181.71	$2.58	$16.53	$200.82
Ind. Labor & Material	1.76	$59.96	$0.00	$0.50	$60.46
State Sales Tax	0.00	$0.00	$0.10	$0.64	$0.74
QA/QC Impact	0.35	$12.08	$0.13	$0.85	$13.06
	7.45	$253.75	$2.81	$18.52	$275.08
Labor Contingency	2.23		Contractor Cost (0.15)		$41.26
			Contingency (0.30)		$94.91
Task 52020 Total	9.68				$411.25
Subject 52020 Total	9.68				$411.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	135.22	$3,744.02	$14,637.55	$6,959.17	$25,340.74
Ind. Labor & Material	44.65	$1,235.53	$0.00	$208.78	$1,444.31
State Sales Tax	0.00	$0.00	$548.91	$268.80	$817.71
QA/QC Impact	8.99	$248.98	$731.87	$358.40	$1,339.25
	188.83	$5,228.53	$15,918.33	$7,795.15	$28,942.01
Labor Contingency	56.65		Contractor Cost (0.15)		$4,341.31
			Contingency (0.30)		$9,985.00
Task 52040 Total	245.48				$43,268.32
Subject 52040 Total	245.48				$43,268.32
Category 52000 Total	320.10				$54,656.77
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	129.04	$4,186.11	$1,233.76	$2,788.50	$8,208.37
Ind. Labor & Material	42.58	$1,381.42	$0.00	$83.66	$1,465.08
State Sales Tax	0.00	$0.00	$49.28	$107.71	$157.97
QA/QC Impact	8.58	$278.38	$61.69	$143.61	$483.68
	180.21	$5,845.91	$1,341.71	$3,123.48	$10,311.10
Labor Contingency	63.07		Contractor Cost (0.15)		$1,546.67
			Contingency (0.35)		$4,150.91
Task 53000 Total	243.28				$16,007.98
Subject 53000 Total	243.28				$16,007.98
Category 53000 Total	243.28				$16,007.98
Area 50000 Total	2075.00				$146,030.26

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 3995.38 x 10^3 man-hrs $266,989.26

Case 9

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Summary Cost Matrix (Table 1)

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Surface Facility Operating Costs

Surface Facility Demolition Costs

Emplacement Container Cost Estimate

Underground Facilities Management and Integration Cost Estimate

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Underground Facilities, Project Phase 2 (Emplacement Operations)

Underground Facilities Project Phase 3 (Caretaker Operations)

Underground Facilities Project Phase 4 (Backfill and Closure)

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05-Jan-89 REVISION "D"

TABLE 1, MRS SYSTEMS STUDY - CASE 9 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.1	0	MANAGEMENT AND INTEGRATION	$243.33	$27.00	$26.51	$53.51	$14.61	$6.87	$21.47	$318.31
	1000	SUPPORT CONTRACTOR	$37.13	$0.00	$0.00	$0.00	$2.92	$0.90	$3.82	$40.95
	1010	Surface	$22.24			$0.00		$0.90	$0.90	
	1020	Subsurface	$14.89			$0.00	$2.92		$2.92	
	2000	ARCHITECT-ENGINEER	$148.52	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$11.69	$3.58	$15.27	$163.78
	2010	Surface	$88.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$3.58	$3.58	
	2020	Subsurface	$59.58	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$11.69		$11.69	
	3000	CONSTRUCTION MANAGEMENT	$56.68	$0.00	$0.00	$0.00	$0.00	$2.39	$2.39	$59.07
	3010	Surface	$34.42	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX		$2.39	$2.39	
	3020	Subsurface	$22.26			$0.00			$0.00	
4.1.0.6	4000	CONSULTANTS		$3.00	$0.51	$3.51			$0.00	$3.51
	5000	PERFORMANCE CONFIRMATION PROGRAM		$24.00	$26.00	$50.00			$0.00	$50.00
8.3	7000	REPOSITORY LAND AQUISITION	$1.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.00
4.3.1	10000	SITE PREPARATION	$178.01	$85.46	$15.97	$101.43	$1.51	$39.85	$41.36	$320.80
	11000	EMPLOYEE TRANSPORTATION		$77.57	$13.63	$91.20	$1.20		$1.20	$92.40
4.3.1.2	12000	ON-SITE	$31.51	$7.89	$2.34	$10.23	$0.31	$5.04	$5.35	$47.09
4.3.1.2.1	12010	Roads	$4.68			$0.00			$0.00	
4.3.1.2.2	12020	Rail	$2.94			$0.00			$0.00	
4.3.1.2.3	12030	Communications	$0.40			$0.00			$0.00	
4.3.1.2.4	12040	Clearing	$1.97	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.5	12050	Grading	$4.18	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
4.3.1.2.6	12060	Landscaping	$0.22			$0.00			$0.00	
4.3.1.2.7	12070	Drainage Control	$0.86			$0.00			$0.00	
4.3.1.2.8	12080	Fencing	$1.16			$0.00			$0.00	
4.3.1.2.9	12090	Utilities	$15.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
4.3.1.2.11	12100	Other	$0.07	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	12101	Heliport	$0.07			$0.00			$0.00	
4.3.1.3	13000	OFF-SITE	$146.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$146.50
4.3.1.3.1	13010	Roads	$18.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13011	New Construction	$11.47			$0.00			$0.00	
	13012	Improvements		XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX		$0.00	
	13013	Bridges	$6.93			$0.00			$0.00	
4.3.1.3.2	13020	Rail	$123.57	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	13021	New Construction	$123.57			$0.00			$0.00	
	13023	Bridges (included with 13013 above)				$0.00			$0.00	
4.3.1.3.5	13050	Utilities	$4.53	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	14000	MONUMENTS	XXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	$34.81	$34.81	$34.81
4.3.2	20000	SURFACE FACILITIES:	$333.80	$1,528.17	$214.74	$1,742.91	$42.39	$20.31	$62.70	$2,139.42
4.3.2.1	21000	WASTE HANDLING FACILITY	$197.90	$536.85	$28.89	$565.74	XXXXXXXXXX	$13.15	$13.15	$776.78
	21100	Waste Handling Building 1:	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXX	$0.00	$0.00	
4.3.2.1.2	21102	Building/Structures	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.3	21103	Hot Cell	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.4	21104	Utilities	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.5	21105	HVAC	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.6	21106	Handling/Packaging Equipment	$0.00			$0.00	XXXXXXXXXX		$0.00	
4.3.2.1.7	21107	Support Facilities	$0.00			$0.00	XXXXXXXXXX		$0.00	

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TABLE 1. MRS SYSTEMS STUDY - CASE 9 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMIS-SIONING	SUBTOTAL CLO. & DEC.	TOTAL
	21200	Waste Handling Building 2:	$152.58	$0.00	$0.00	$0.00	XXXXXXXXXXX	$8.95	$8.95	
4.3.2.1.9	21202	Building/Structures	$68.82			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.10	21203	Hot Cell	$20.55			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.11	21204	Utilities	$10.67			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.12	21205	HVAC	$7.58			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.13	21206	Handling/Packaging Equipment	$40.56			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.1.14	21207	Support Facilities	$4.40			$0.00	XXXXXXXXXXX		$0.00	
	21500	Other	$45.32	$0.00	$0.00	$0.00	XXXXXXXXXXX	$4.20	$4.20	
4.3.2.1.15	21501	Site-Generated Radwaste Treatment Facility	$20.02			$0.00	XXXXXXXXXXX	$1.69	$1.69	
	21502	Vehicle Wash Facility	$0.79			$0.00	XXXXXXXXXXX	$0.07	$0.07	
	21503	Decontamination Building	$3.43			$0.00	XXXXXXXXXXX	$0.26	$0.26	
	21504	Performance Confirmation (Diagnostic) Facil	$21.08			$0.00	XXXXXXXXXXX	$2.18	$2.18	
4.3.2.1.16	21505	Radwaste Storage	$0.00			$0.00	XXXXXXXXXXX		$0.00	
4.3.2.2	22000	BALANCE OF PLANT	$88.48	$964.55	$170.38	$1,134.94	$32.37	$4.45	$36.82	$1,260.24
4.3.2.2.1	22010	Health/Medical Facilities	$3.04			$0.00	$19.02		$19.02	
4.3.2.2.2	22020	Fire Protection Facilities	$1.52			$0.00			$0.00	
4.3.2.2.3	22030	Security Facilites	$3.45			$0.00			$0.00	
4.3.2.2.4	22040	Maintenance Facilities	$6.49			$0.00			$0.00	
4.3.2.2.5	22050	Administration/Personnel Facilities	$10.53			$0.00			$0.00	
4.4.0.1.4	22060	Training/Mockup Facility	$3.52			$0.00			$0.00	
4.3.2.2.7	22070	Warehouse and Receiving	$12.48			$0.00			$0.00	
4.3.2.2.8	22080	Visitors Center Facility	$0.75			$0.00			$0.00	
4.3.2.2.9	22090	Backup Power Generation Facility	$5.96			$0.00			$0.00	
4.3.2.2.10	22100	Change Room Facility	$1.96			$0.00			$0.00	
4.3.2.2.11	22110	Explosive Storage Facility	$0.12			$0.00			$0.00	
4.3.2.2.12	22120	Compressed Air and Steam Facility	$0.00			$0.00			$0.00	
4.3.2.2.13	22130	Cooling Tower and Chilled Water Facility	$0.98			$0.00	$13.35		$13.35	
4.3.2.2.14	22140	Excavated Material Storage and Handling Facility	$6.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22141	Surface Excavated Material Storage and Hand	$6.55			$0.00			$0.00	
4.3.2.2.15	22150	Fuel Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.16	22160	Chemical Storage Facility	$0.00			$0.00			$0.00	
4.3.2.2.6	22170	Lab and Testing Facilities	$0.00			$0.00			$0.00	
4.3.2.2.18	22180	Potable Water Facility	$0.00			$0.00			$0.00	
4.3.2.2.19	22190	Sewage Treatment Facility	$1.65			$0.00			$0.00	
4.3.2.2.20	22200	Backfill Facility	$0.00			$0.00			$0.00	
4.3.2.2.21	22210	Packing Facility	$0.00			$0.00			$0.00	
4.3.2.2.17	22220	Control and Monitoring Facility	$20.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22221	Facilities	$0.00			$0.00			$0.00	
	22222	Computer Equipment	$0.00			$0.00			$0.00	
	22230	Standard Equipment	$6.79			$0.00			$0.00	
	22240	Other	$2.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
	22241	Solid Waste	$0.00			$0.00			$0.00	
	22242	Batch Plant	$2.39			$0.00			$0.00	
	23000	SURFACE SHAFT FACILITIES	$47.42	$26.77	$15.47	$42.24	$10.03	$2.71	$12.74	$102.40
	23010	Men and Materials Facility	$13.82	$25.72	$14.32	$40.04	$9.64	$0.67	$10.31	
	23011	Headframe	$6.56	$25.72	$14.32	$40.04	$9.64		$9.64	
	23012	Hoist House	$0.66			$0.00			$0.00	
	23013	Ventilation Building	$6.60			$0.00			$0.00	

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TABLE 1, MRS SYSTEMS STUDY - CASE 9 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
	23080	Confinement Exhaust Facility - 1	$31.27	$0.36	$0.39	$0.75	$0.14	$2.04	$2.18	
	23083	Ventilation Building	$30.74			$0.00		$2.04	$2.04	
	23085	Other	$0.53	$0.36	$0.39	$0.75	$0.14		$0.14	
	23100	Exploratory Shaft Facility - 1	$2.28	$0.35	$0.38	$0.72	$0.13	$0.00	$0.13	
	23105	Other	$2.28	$0.35	$0.38	$0.72	$0.13		$0.13	
	23110	Exploratory Shaft Facility - 2	$0.06	$0.35	$0.38	$0.72	$0.12	$0.00	$0.12	
	23115	Other	$0.06	$0.35	$0.38	$0.72	$0.12		$0.12	
4.3.3	30000	SHAFTS/RAMPS - UNDERGROUND	$65.57	$14.70	$15.92	$30.62	$3.24	XXXXXXXXXXX	$3.24	$99.43
4.3.3.1	30010	Men and Materials Access (Shaft)	$23.26	$5.67	$6.14	$11.81	$1.59	XXXXXXXXXXX	$1.59	
4.3.3.2	30020	Waste Handling Access (Shaft or Ramp)	$9.09	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
4.3.3.3	30030	Excavated Material Handling Access (Shaft or Ram	$6.97	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXX	$0.00	
	30080	Confinement Exhaust Access - 1 (Shaft)	$22.78	$4.61	$4.99	$9.59	$0.86	XXXXXXXXXXX	$0.86	
	30100	Exploratory Shaft - 1	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXX	$0.41	
4.3.3.5.3	30103	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30104	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30105	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30106	Other (Specify)	$3.07	$2.21	$2.40	$4.61	$0.41	XXXXXXXXXXX	$0.41	
	30110	Exploratory Shaft - 2	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXXX	$0.37	
4.3.3.5.3	30113	Lining				$0.00		XXXXXXXXXXX	$0.00	
4.3.3.5.4	30114	Fixtures				$0.00		XXXXXXXXXXX	$0.00	
	30115	Shaft Stations				$0.00		XXXXXXXXXXX	$0.00	
	30116	Other (Specify)	$0.41	$2.21	$2.40	$4.61	$0.37	XXXXXXXXXXX	$0.37	
4.3.4	40000	SUBSURFACE EXCAVATIONS	$143.01	$824.22	$43.88	$868.10	$107.69	XXXXXXXXXXX	$107.69	$1,118.80
4.3.4.1	41000	DEVELOPMENT	$122.83	$635.00	$41.43	$676.43	$13.60	XXXXXXXXXXX	$13.60	$812.86
	41010	Common Facility (Shaft Pillar) Excavation	$15.46	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41011	Main Drifts	$5.63	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41012	Ventilation Drifts	$4.94	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41013	Support Facilities	$4.44	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41014	Training Areas	$0.24	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41015	Performance Confirmation	$0.22	$0.00	XXXXXXXXXXX	$0.00	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41020	Spent Fuel Facility Excavation	$76.91	$436.19	XXXXXXXXXXX	$436.19	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41021	Main Drifts	$10.21	$14.44	XXXXXXXXXXX	$14.44	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41022	Access Drifts	$12.19	$47.06	XXXXXXXXXXX	$47.06	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41023	Ventilation Drifts	$11.21	$22.94	XXXXXXXXXXX	$22.94	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41024	Emplacement Drifts	$23.75	$175.51	XXXXXXXXXXX	$175.51	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41025	Emplacement Borehole Drilling/Lining	$19.55	$176.25	XXXXXXXXXXX	$176.25	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41030	DHLW Facility Excavation	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41035	Emplacement Borehole Drilling/Lining	$5.37	$91.61	XXXXXXXXXXX	$91.61	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41040	Other Waste Facility Excavation	$3.33	$9.62	XXXXXXXXXXX	$9.62	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41045	Emplacement Borehole Drilling/Lining	$3.33	$9.62	XXXXXXXXXXX	$9.62	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	41060	Excavated Material Handling	$12.87	$31.64	$0.00	$31.64	$0.00	XXXXXXXXXXX	$0.00	
	41070	General Maintenance	$8.89	$65.93	$41.43	$107.36	$13.60	XXXXXXXXXXX	$13.60	
4.3.4.2	42000	EMPLACEMENT/RETRIEVAL OPERATIONS	$20.18	$189.22	$2.45	$191.67	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$211.85
	42010	Spent Fuel Waste Transport and Emplacement	$10.53	$118.77	$0.00	$118.77	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42020	DHLW Transport and Emplacement	$6.30	$62.15	$0.00	$62.15	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42030	Other Waste Transport and Emplacement	$3.35	$6.50	$0.00	$6.50	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	
	42040	Waste Retrieval		$1.79	$2.45	$4.24	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	

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REVISION "D"

TABLE 1. MRS SYSTEMS STUDY - CASE 9 COST MATRIX
(MILLIONS OF MID 1988 CONSTANT DOLLARS)

SITE: TUFF Repository, NV

WBS/DAS CODE	COST CODE	COST ACCOUNT TITLE	ENGINEERING & CONSTRUCTION	EMPLACEMENT OPERATIONS	CARETAKER OPERATIONS	SUBTOTAL OPERATIONS	CLOSURE	DECOMMISSIONING	SUBTOTAL CLO. & DEC.	TOTAL
4.3.4.3	43000	BACKFILL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$94.09	XXXXXXXXXXXX	$94.09	$94.09
	43010	Men and Materials Access (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$4.98	XXXXXXXXXXXX	$4.98	
	43020	Waste Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$3.04	XXXXXXXXXXXX	$3.04	
	43030	Muck Handling Access (Shaft or Ramp)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$1.69	XXXXXXXXXXXX	$1.69	
	43080	Confinement Exhaust Access - 1 (Shaft)	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.59	XXXXXXXXXXXX	$0.59	
	43100	Exploratory Shaft - 1	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.56	XXXXXXXXXXXX	$0.56	
	43110	Exploratory Shaft - 2	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	$0.12	XXXXXXXXXXXX	$0.12	
	43300	Development Areas	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	$83.12	XXXXXXXXXXXX	$83.12	
4.3.5	50000	UNDERGROUND SERVICE SYSTEMS	$100.03	$670.01	$195.03	$865.05	$146.03	XXXXXXXXXXXX	$146.03	$1,111.11
4.3.5.1	51000	SUPPORT SYSTEM FACILITIES	$77.32	$527.79	$114.25	$642.04	$75.37	XXXXXXXXXXXX	$75.37	$794.73
4.3.5.1.1	51010	Material Support, Receiving/Warehousing	$12.96	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXXX	$11.76	
	51011	Facilities	$8.46	$43.69	$19.19	$62.89	$11.76	XXXXXXXXXXXX	$11.76	
	51012	Initial Inventory	$4.50	$0.00	$0.00	$0.00	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.3	51030	Maintenance Facility	$39.88	$345.65	$33.44	$379.09	$21.88	XXXXXXXXXXXX	$21.88	
	51031	Development Area	$38.88	$228.00	$24.42	$252.42	$21.88	XXXXXXXXXXXX	$21.88	
	51032	Emplacement Area	$1.00	$117.65	$9.01	$126.67	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.4	51040	Emergency Medical/Rescue Chamber	$3.27	$15.79	$1.69	$17.49	$5.93	XXXXXXXXXXXX	$5.93	
4.3.5.1.5	51050	Ventilation System (Waste Emplacement)	$1.01	$23.47	$8.70	$32.17	$20.85	XXXXXXXXXXXX	$20.85	
4.3.5.1.6	51060	Ventilation System (Mine Development)	$7.00	$36.54	$0.00	$36.54	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.1.7	51070	Mine Water Control System	$1.17	$7.24	$7.84	$15.08	$2.72	XXXXXXXXXXXX	$2.72	
4.3.5.1.8	51080	Fire Protection/Control	$0.50	$0.89	$0.60	$1.48	$0.33	XXXXXXXXXXXX	$0.33	
4.3.5.1.9	51090	Operations Support Facility	$1.57	$4.09	$1.75	$5.84	$1.48	XXXXXXXXXXXX	$1.48	
4.3.5.1.10	51100	Contamination Control System	$8.15	$30.54	$19.50	$50.03	$10.43	XXXXXXXXXXXX	$10.43	
4.3.5.1.11	51110	Control Room Facility	$1.82	$19.89	$21.54	$41.43	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.2	52000	UTILITIES	$10.02	$29.11	$24.15	$53.26	$54.66	XXXXXXXXXXXX	$54.66	$117.93
4.3.5.2.1	52010	Electrical	$8.08	$20.64	$9.25	$29.89	$10.98	XXXXXXXXXXXX	$10.98	
4.3.5.2.2	52020	Communications	$0.24	$1.59	$2.30	$3.89	$0.41	XXXXXXXXXXXX	$0.41	
4.3.5.2.4	52040	Chilled Water	$1.18	$5.37	$12.60	$17.97	$43.27	XXXXXXXXXXXX	$43.27	
4.3.5.2.5	52050	Water	$0.52	$1.51	$0.00	$1.51	$0.00	XXXXXXXXXXXX	$0.00	
4.3.5.3	53000	MONITORING	$12.69	$113.11	$56.64	$169.75	$16.01	XXXXXXXXXXXX	$16.01	$198.45
		TOTAL REPOSITORY	$1,063.77	$3,149.55	$512.06	$3,661.61	$315.48	$67.02	$382.50	$5,107.88
2.4	60000	EMPLACEMENT CONTAINERS	XXXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$31.12
	61000	SPENT FUEL	XXXXXXXXXXXXXXX	$0.00	$0.00	$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$0.00
	61010	Intact PWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	61020	Intact BWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	61030	Consolidated PWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	61040	Consolidated BWR	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	62000	DHLW	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$0.00
	63000	OTHER WASTE	XXXXXXXXXXXXXXX	$22.38	$8.74	$31.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	$31.12
	63010	Spent Fuel Hardware	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	63020	High Activity (Remote-Handled)	XXXXXXXXXXXXXXX	$6.38	$8.74	$15.12	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	63030	WVHLW and CHLW	XXXXXXXXXXXXXXX	$0.00		$0.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	63040	Contact-Handled	XXXXXXXXXXXXXXX	$16.00		$16.00	XXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	
	99999	TOTAL REPOSITORY, with EMPLACEMENT CONTAINERS	$1,063.77	$3,171.94	$520.80	$3,692.73	$315.48	$67.02	$382.50	$5,139.00

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 9
(DOLLARS IN THOUSANDS - 1110TR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%		CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST		ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	120.10	ON SITE - ROADS	22.0	637.5	2,383.5	0.0	3,021.0	637.5	89.4	25%	937.0	4,684.9	320.1	5,005.0	10%	365.9	18.3	96.1	480.3	5,485.3
	120.20	ON SITE - RAIL	12.0	348.3	1,596.0	0.0	1,944.3	348.3	59.9	25%	588.1	2,940.6	200.6	3,141.2	10%	229.3	11.5	60.2	301.0	3,442.2
	120.30	ON SITE - COMMUNICATIONS	2.1	61.5	13.8	173.6	248.9	61.5	7.0	25%	79.4	396.8	27.2	424.0	10%	31.0	1.6	8.2	40.8	464.8
	120.40	ON SITE - CLEARING	28.4	822.1	0.0	0.0	822.1	822.1	0.0	20%	328.8	1,973.0	138.1	2,111.1	5%	82.2	4.1	17.3	103.6	2,214.7
	120.50	ON SITE - GRADING	60.0	1,740.2	0.0	0.0	1,740.2	1,740.2	0.0	20%	696.1	4,176.5	292.4	4,468.9	5%	174.0	8.7	36.5	219.2	4,688.1
	120.60	ON SITE - LANDSCAPING	2.5	73.8	33.4	0.0	107.2	73.8	1.3	20%	36.5	218.8	15.2	234.0	5%	9.1	0.5	1.9	11.5	245.5
	120.70	ON SITE - DRAINAGE CONTROL	12.4	358.7	0.0	0.0	358.7	358.7	0.0	20%	143.5	860.9	60.3	921.2	5%	35.9	1.8	7.5	45.2	966.4
	120.80	ON SITE - FENCING	8.6	248.9	448.4	0.0	697.3	248.9	16.8	20%	192.6	1,155.6	79.5	1,235.1	5%	47.3	2.4	9.9	59.6	1,294.7
	120.90	ON SITE - UTILITIES	73.8	2,076.1	1,815.8	5,327.9	9,219.8	2,076.1	267.9	30%	3,469.1	15,032.9	1,027.9	16,060.8	15%	1,694.4	84.7	533.7	2,312.8	18,373.6
	121.01	ON SITE - HELIPORT PAD	0.6	16.5	25.4	0.0	41.9	16.5	1.0	20%	11.9	71.3	4.9	76.2	5%	2.9	0.1	0.6	3.6	79.8
		SUBTOTAL 120 - ON SITE	222.4	$6,383.6	$6,316.3	$5,501.5	$18,201.4	$6,383.6	$443.3		$6,483.0	$31,511.3	$2,166.2	$33,677.5		$2,672.0	$133.7	$771.9	$3,577.6	$37,255.1
	130.11	OFF SITE - ROADS (NEW)	58.0	1,682.4	5,603.5	0.0	7,285.9	1,682.4	210.1	25%	2,294.6	11,473.0	784.7	12,257.7	10%	896.8	44.8	235.4	1,177.0	13,434.7
	130.13	OFF SITE - BRIDGES	50.5	1,463.6	2,314.1	0.0	3,777.7	1,463.6	86.8	30%	1,598.4	6,926.5	477.0	7,403.5	15%	786.2	39.3	247.7	1,073.2	8,476.7
	130.21	OFF SITE - RAIL (NEW)	479.0	13,889.5	68,508.6	0.0	82,398.1	13,889.5	2,569.1	25%	24,714.2	123,570.9	8,425.2	131,996.1	10%	9,628.8	481.4	2,527.6	12,637.8	144,633.9
	130.50	OFF SITE - UTILITIES	39.1	1,133.4	949.5	224.7	2,307.6	1,133.4	44.0	30%	1,045.5	4,530.5	313.1	4,843.6	15%	516.2	25.8	162.6	704.6	5,548.2
	140.00	MONUMENTS	209.1	6,064.5	15,142.2	5.3	21,212.0	6,064.5	568.0	25%	6,961.1	34,805.6	2,386.7	37,192.3	10%	2,727.7	136.4	716.0	3,580.1	40,772.4
		SUBTOTAL 130 - OFF SITE	835.7	$24,233.4	$92,517.9	$230.0	$116,981.3	$24,233.4	$3,478.0		$36,613.8	$181,306.5	$12,386.7	$193,693.2		$14,555.7	$727.7	$3,889.3	$19,172.7	$212,865.9
4.3.1	TOTAL 100 - SITE		1,058.1	$30,617.0	$98,834.2	$5,731.5	$135,182.7	$30,617.0	$3,921.3		$43,096.8	$212,817.8	$14,552.9	227,370.7		$17,227.7	$861.4	$4,661.2	$22,750.3	$250,121.0
	211.02	MHB I - BUILDING/STRUCTURE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.03	MHB I - HOT CELL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.04	MHB I - UTILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.05	MHB I - HVAC EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.06	MHB I - HANDL/PACK EQUIP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
	211.07	MHB I - SUPPORT FACILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40%	0.0	0.0	0.0	0.0	25%	0.0	0.0	0.0	0.0	0.0
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0		$0.0	$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	579.4	16,801.2	14,009.8	982.2	31,793.2	16,801.2	562.2	40%	19,662.6	68,819.2	4,762.2	73,581.4	25%	12,148.6	607.4	5,102.4	17,858.4	91,439.8
	212.03	MHB II - HOT CELL EQUIP	72.3	2,097.7	0.0	10,104.1	12,201.8	2,097.7	378.9	40%	5,871.4	20,549.8	1,401.4	21,951.2	25%	3,574.9	178.7	1,501.4	5,255.0	27,206.2
	212.04	MHB II - UTILITIES	93.4	2,575.2	958.9	1,421.9	4,956.0	2,575.2	89.3	40%	3,048.2	10,668.7	738.1	11,406.8	25%	1,882.8	94.1	790.8	2,767.7	14,174.5
	212.05	MHB II - HVAC EQUIPMENT	42.7	1,238.2	1,336.8	1,493.6	4,068.6	1,238.2	106.1	40%	2,165.2	7,578.1	520.1	8,098.2	25%	1,326.7	66.3	557.2	1,950.2	10,048.4
	212.06	MHB II - HANDL/PACK EQUIP	145.0	4,204.2	0.0	19,817.6	24,021.8	4,204.2	743.2	40%	11,587.7	40,556.9	2,766.1	43,323.0	25%	7,056.5	352.8	2,963.7	10,373.0	53,696.0
	212.07	MHB II - SUPPORT FAC.	7.6	221.2	0.0	2,599.9	2,821.1	221.2	97.5	40%	1,255.9	4,395.7	298.1	4,693.8	25%	760.6	38.0	319.4	1,118.0	5,811.8
		SUBTOTAL 212 - MHB II	940.4	$27,137.7	$16,305.5	$36,419.3	$79,862.5	$27,137.7	$1,977.2		$43,591.0	$152,568.4	$10,486.0	$163,054.4		$26,750.1	$1,337.3	$11,234.9	$39,322.3	$202,376.7
	215.01	WASTE TREATMENT BUILDING	115.6	3,351.6	2,717.5	4,605.3	10,674.4	3,351.6	274.6	40%	5,720.2	20,020.8	1,374.5	21,395.3	25%	3,506.5	175.3	1,472.7	5,154.5	26,549.8
	215.02	VEHICLE WASH FACILITY	4.7	135.3	171.7	152.0	459.0	135.3	12.1	30%	181.9	788.3	54.1	842.4	15%	89.1	4.5	28.1	121.7	964.1
	215.03	DECONTAMINATION BUILDING	20.0	579.2	906.5	516.5	2,002.2	579.2	53.4	30%	790.4	3,425.2	234.9	3,660.1	15%	387.2	19.4	122.0	528.6	4,188.7
	215.04	PERFORMANCE CONFIRM. FAC.	139.7	4,045.2	3,565.1	3,146.6	10,756.9	4,045.2	251.7	40%	6,021.5	21,075.3	1,450.6	22,525.9	25%	3,700.5	185.0	1,554.2	5,439.7	27,965.6
		SUBTOTAL 215 - OTHER	280.0	$8,111.3	$7,360.8	$8,420.4	$23,892.5	$8,111.3	$591.8		$12,714.0	$45,309.6	$3,114.1	$48,423.7		$7,683.3	$384.2	$3,177.0	$11,244.5	$59,668.2
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		1,220.4	$35,249.0	$23,666.3	$44,839.7	$103,755.0	$35,249.0	$2,569.0		$56,305.9	$197,878.0	$13,600.1	$211,478.1		$34,433.4	$1,721.5	$14,411.9	$50,566.8	$262,044.9

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TUFF REPOSITORY SURFACE FACILITIES
CAPITAL COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 9
(DOLLARS IN THOUSANDS - 111QTR88) REVISION "C"

DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	BULK MATERIAL	EQUIPMENT COST	TOTAL DIRECT COST	INDIRECT COST @ 100 %	SALES TAX @ 3.75%	CONTINGENCY	SUB TOTAL	CONSTR. MGT. @ 7.0%	TOTAL CONSTRUCTION COST	ENGR	ENGR QA @ 5.0%	CONTINGENCY	TOTAL ENGR	TOTAL CAPITAL COST
	220.10	HEALTH/MEDICAL FACILITIES	17.6	509.2	477.1	888.9	1,875.2	509.2	51.2 25%	608.9	3,044.5	208.6	3,253.1 10%	238.4	11.9	62.6	312.9	3,566.0
	220.20	FIRE STATION	12.2	354.4	384.0	102.1	840.5	354.4	18.2 25%	303.3	1,516.4	104.6	1,621.0 10%	119.5	6.0	31.4	156.9	1,777.9
	220.30	SECURITY FACILITIES	21.2	614.8	568.0	803.2	1,986.0	614.8	51.4 30%	795.7	3,447.9	236.7	3,684.6 15%	390.1	19.5	122.9	532.5	4,217.1
	220.40	MAINTENANCE FACILITIES	49.4	1,433.2	1,828.3	415.4	3,676.9	1,433.2	84.1 25%	1,298.6	6,492.8	447.1	6,939.9 10%	511.0	25.6	134.2	670.8	7,610.7
	220.50	ADMIN/PERSONNEL FACILITIES	89.1	2,582.9	2,290.7	536.2	5,409.8	2,582.9	106.0 30%	2,429.6	10,528.3	727.3	11,255.6 15%	1,198.9	59.9	377.6	1,636.4	12,892.0
	220.60	MOCK-UP BUILDING	20.6	595.9	957.0	501.3	2,054.2	595.9	54.7 30%	811.4	3,516.2	241.2	3,757.4 15%	397.5	19.9	125.2	542.6	4,300.0
	220.70	WAREHOUSE & RECEIVING FAC.	85.3	2,474.2	4,477.5	375.5	7,327.2	2,474.2	182.0 25%	2,495.9	12,479.3	857.6	13,336.9 10%	980.1	49.0	257.3	1,286.4	14,623.3
	220.80	VISITOR CENTER FACILITY	6.0	175.2	187.4	55.8	418.4	175.2	9.1 25%	150.7	753.4	51.9	805.3 10%	59.4	3.0	15.6	78.0	883.3
	220.90	STANDBY POWER GEN. FAC.	15.2	439.6	222.1	3,348.0	4,009.7	439.6	133.9 30%	1,375.0	5,958.2	404.9	6,363.1 15%	667.4	33.4	210.2	911.0	7,274.1
	221.00	CHANGE HOUSE	16.2	468.6	447.9	99.8	1,016.3	468.6	20.5 30%	451.6	1,957.0	135.1	2,092.1 15%	222.7	11.1	70.1	303.9	2,396.0
	221.10	EXPLOSIVE MAGAZINES	1.3	37.2	21.4	2.4	61.0	37.2	0.9 25%	24.8	123.9	8.6	132.5 10%	9.8	0.5	2.6	12.9	145.4
	221.30	COOLING TOWER	1.7	50.0	4.6	652.7	707.3	50.0	24.6 25%	195.5	977.4	66.3	1,043.7 10%	75.7	3.8	19.9	99.4	1,143.1
	221.41	SURFACE EXCV MATL HANDLING	37.2	1,078.9	42.7	2,925.2	4,046.8	1,078.9	111.3 25%	1,309.3	6,546.3	448.5	6,994.8 10%	512.6	25.6	134.6	672.8	7,667.6
	221.90	SEWAGE FACILITY	15.1	439.0	419.4	8.4	866.8	439.0	16.0 25%	330.5	1,652.3	114.3	1,766.6 10%	130.6	6.5	34.3	171.4	1,938.0
	222.20	MONITORING FACILITY	28.7	833.0	256.8	13,184.8	14,274.6	833.0	504.1 30%	4,683.5	20,295.2	1,374.8	21,670.0 15%	2,266.1	113.3	713.8	3,093.2	24,763.2
	222.30	STANDARD EQUIPMENT	0.8	23.7	0.0	5,186.5	5,210.2	23.7	194.5 25%	1,357.1	6,785.5	458.0	7,243.5 10%	523.4	26.2	137.4	687.0	7,930.5
	222.42	BATCH PLANT	10.2	296.2	0.5	1,273.0	1,569.7	296.2	47.8 25%	478.4	2,392.1	163.3	2,555.4 10%	186.6	9.3	49.0	244.9	2,800.3
4.3.2.2	TOTAL	220 - BALANCE OF PLANT	427.8	$12,406.0	$12,585.4	$30,359.2	$55,350.6	$12,406.0	$1,610.3	$19,099.8	$88,466.7	$6,048.8	$94,515.5	$8,489.8	$424.5	$2,498.7	$11,413.0	$105,928.5
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	5.3	153.8	159.1	35.6	348.5	153.8	7.3 30%	152.9	662.5	45.7	708.2 15%	75.3	3.8	23.7	102.8	811.0
4.3.3.1	230.13	SURFACE VENT. FACILITIES	42.1	1,221.7	1,857.2	503.3	3,582.2	1,221.7	88.5 35%	1,712.3	6,604.7	454.0	7,058.7 20%	960.8	48.0	353.1	1,361.9	8,420.6
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	167.0	4,841.5	6,572.4	6,041.1	17,455.0	4,841.5	473.0 35%	7,969.3	30,738.8	2,107.0	32,845.8 20%	4,459.3	223.0	1,638.8	6,321.1	39,166.9
	TOTAL	230 - SURFACE SHAFT FAC.	214.4	$6,217.0	$8,588.7	$6,580.0	$21,385.7	$6,217.0	$568.8	$9,834.5	$38,006.0	$2,606.7	$40,612.7	$5,495.4	$274.8	$2,015.6	$7,785.8	$48,398.5
4.0	GRAND TOTAL	SURFACE FACILITIES	2,920.7	$84,489.0	$143,674.6	$87,510.4	$315,674.0	$84,489.0	$8,669.4	$128,336.1	$537,168.5	$36,808.5	$573,977.0	$65,646.3	$3,282.2	$23,587.4	$92,515.9	$666,492.9

DATE : 08-Nov-88

JOB 16039 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 9
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2000	2001	2002	2003	2004	2005	2006	2007 THRU 2026	2027	TOTAL EMPLACEMENT PERIOD
LABOR , MATERIAL & SUPPLIES		$26	$26	$26	$260	$260	$260	$260	$5,200	$260	$6,578
EMPLOYEE TRANSPORTATION	# of BUSES	2	4	6	9	11	14	15	15	15	
BUSES AT $100.0 K per YEAR	COST	$200	$400	$600	$900	$1,100	$1,400	$1,500	$30,000	$1,500	$37,600
	SUBTOTAL - 100	$226	$426	$626	$1,160	$1,360	$1,660	$1,760	$35,200	$1,760	$44,178
CONTINGENCY @ 20%		$45	$85	$125	$232	$272	$332	$352	$7,040	$352	$8,836
	TOTAL - 100	$271	$511	$751	$1,392	$1,632	$1,992	$2,112	$42,240	$2,112	$53,014
210 - WASTE HANDLING FACILITIES											
LABOR:	# of PEOPLE	12	30	50	70	91	111	117	117	117	
COST PER YR/ PERSON $52,700	COST	$632	$1,581	$2,635	$3,689	$4,796	$5,850	$6,166	$123,318	$6,166	$154,833
OPERATING SUPPLIES @ 5.0% of LABOR		$32	$79	$132	$184	$240	$292	$308	$6,166	$308	$7,742
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
as a PERCENT of CAPITAL COST	COST	$1,310	$1,310	$1,310	$7,860	$7,860	$7,860	$7,860	$157,200	$7,860	$200,430
Capital Cost = 262 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$1,342	$1,389	$1,442	$8,044	$8,100	$8,152	$8,168	$163,366	$8,168	$208,172
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	1	1	1	10	10	10	10	10	10	
@ $.05/Kwhr	COST	$50	$50	$50	$500	$500	$500	$500	$10,000	$500	$12,650
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$50	$52	$54	$302	$304	$306	$306	$6,126	$306	$7,806
	SUBTOTAL - 210	$2,074	$3,072	$4,181	$12,535	$13,699	$14,808	$15,141	$302,810	$15,141	$383,461
CONTINGENCY @ 40%		$830	$1,229	$1,672	$5,014	$5,480	$5,923	$6,056	$121,124	$6,056	$153,384
	TOTAL - 210	$2,904	$4,301	$5,853	$17,549	$19,179	$20,731	$21,197	$423,934	$21,197	$536,845
220 - BALANCE of PLANT											
LABOR:	# of PEOPLE	43	115	187	256	346	416	452	452	452	
COST PER YR/ PERSON $52,700	COST	$2,266	$6,061	$9,855	$13,491	$18,234	$21,923	$23,820	$476,408	$23,820	$595,879
OPERATING SUPPLIES @ 5.0% of LABOR		$113	$303	$493	$675	$912	$1,096	$1,191	$23,820	$1,191	$29,794
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
as a PERCENT of CAPITAL COST	COST	$770	$770	$770	$3,080	$3,080	$3,080	$3,080	$61,600	$3,080	$79,310
Capital Cost = 154 MILLION											
SUBTOTAL MATERIAL & SUPPLIES		$883	$1,073	$1,263	$3,755	$3,992	$4,176	$4,271	$85,420	$4,271	$109,104
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	2.6	2.6	2.6	26	26	26	26	26	26	
@ $.05/Kwhr	COST	$130	$130	$130	$1,300	$1,300	$1,300	$1,300	$26,000	$1,300	$32,890
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$33	$40	$47	$141	$150	$157	$160	$3,203	$160	$4,091
	SUBTOTAL - 220	$3,313	$7,304	$11,295	$18,687	$23,676	$27,556	$29,552	$591,032	$29,552	$741,964
CONTINGENCY @ 30%		$994	$2,191	$3,388	$5,606	$7,103	$8,267	$8,865	$177,309	$8,865	$222,589
	TOTAL - 220	$4,306	$9,495	$14,683	$24,293	$30,778	$35,823	$38,417	$768,341	$38,417	$964,554
TOTAL ANNUAL O & M COST		$7,482	$14,307	$21,288	$43,234	$51,589	$58,546	$61,726	$1,234,515	$61,726	$1,554,412

DATE : 08-Nov-88

JOB 16039 - TUFF REPOSITORY - OPERATING COST ESTIMATE
MRS SYSTEM STUDY - CASE 9
($ 1,000 's - IIIQTR88)
REVISION "C"

100 - SITE		2028	2029 THRU 2051	2052	TOTAL CARE TAKING PERIOD	CLOSURE 2053 THRU 2062	TOTAL OPERATING COST
LABOR , MATERIAL & SUPPLIES		$78	$1,794	$78	$1,950	$260	$8,788
EMPLOYEE TRANSPORTATION	# of BUSES	9	2	1		1	
BUSES AT $100.0 K per YEAR	COST	$900	$4,600	$100	$5,600	$1,000	$44,200
	SUBTOTAL - 100	$978	$6,394	$178	$7,550	$1,260	$52,988
CONTINGENCY @ 20%		$196	$1,279	$36	$1,510	$252	$10,598
	TOTAL - 100	$1,174	$7,673	$214	$9,060	$1,512	$63,586
210 - WASTE HANDLING FACILITIES							
LABOR:	# of PEOPLE	69	12	6		0	
COST PER YR/ PERSON $52,700	COST	$3,636	$14,545	$316	$18,498	$0	$173,330
OPERATING SUPPLIES @ 5.0% of LABOR		$182	$727	$16	$925	$0	$8,667
MAINTENANCE MATERIAL	PERCENT	0.01%	0.01%	0.01%		0	
as a PERCENT of CAPITAL COST	COST	$26	$603	$26	$655	$0	$201,085
Capital Cost = 262 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$208	$1,330	$42	$1,580	$0	$209,752
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	0.4	0.4	0.4		0	
@ $.05/Kwhr	COST	$20	$460	$20	$500	$0	$13,150
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$8	$50	$2	$59	$0	$7,866
	SUBTOTAL - 210	$3,872	$16,385	$380	$20,637	$0	$404,097
CONTINGENCY @ 40%		$1,549	$6,554	$152	$8,255	$0	$161,639
	TOTAL - 210	$5,421	$22,939	$532	$28,892	$0	$565,736
220 - BALANCE of PLANT							
LABOR:	# of PEOPLE	252	64	32		19	
COST PER YR/ PERSON $52,700	COST	$13,280	$77,574	$1,686	$92,541	$10,013	$698,433
OPERATING SUPPLIES @ 5.0% of LABOR		$664	$3,879	$84	$4,627	$501	$34,922
MAINTENANCE MATERIAL	PERCENT	0.5%	0.5%	0.5%		0.1%	
as a PERCENT of CAPITAL COST	COST	$770	$17,710	$770	$19,250	$1,540	$100,100
Capital Cost = 154 MILLION							
SUBTOTAL MATERIAL & SUPPLIES		$1,434	$21,589	$854	$23,877	$2,041	$135,022
UTILITIES (Elect. Power)	Kwhr/Yr.(X 10^6)	11	11	11		5	
@ $.05/Kwhr	COST	$550	$12,650	$550	$13,750	$2,500	$49,140
LOCAL TAXES @ 3.75% OF MAT'L & SUPPLIES		$54	$810	$32	$895	$77	$5,063
	SUBTOTAL - 220	$15,318	$112,623	$3,123	$131,064	$14,630	$887,658
CONTINGENCY @ 30%		$4,595	$33,787	$937	$39,319	$4,389	$266,297
	TOTAL - 220	$19,914	$146,410	$4,060	$170,383	$19,019	$1,153,955
TOTAL ANNUAL O & M COST		$26,508	$177,021	$4,805	$208,334	$20,531	$1,783,278

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 9
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	120.10	ON SITE - ROADS	11.6	306.1	0.0	0.0	306.1	100%	306.1	612.2	35%	214.3	10%	82.7	0.0	(0.2)	909.0
	120.20	ON SITE - RAIL		INCLUDED ABOVE													
	120.30	ON SITE - COMMUNICATIONS	0.2	6.0	0.0	0.0	6.0	75%	4.5	10.5	35%	3.7	10%	1.4	0.0	0.4	16.0
	120.40	ON SITE - CLEARING	34.5	910.3	0.0	0.0	910.3	100%	910.3	1,820.6	35%	637.2	10%	245.8	0.0	0.4	2,704.0
	120.50	ON SITE - GRADING		INCLUDED ABOVE													
	120.60	ON SITE - LANDSCAPING	5.1	133.9	271.5	0.0	405.4	75%	100.4	505.8	35%	177.0	10%	68.3	0.0	(0.1)	751.0
	120.70	ON SITE - DRAINAGE CONTROL		0.0													
	120.80	ON SITE - FENCING	1.5	39.1	0.0	0.0	39.1	80%	31.3	70.4	35%	24.6	10%	9.5	0.0	0.5	105.0
	120.90	ON SITE - UTILITIES	7.8	207.0	0.0	0.0	207.0	75%	155.3	362.3	35%	126.8	10%	48.9	0.0		538.0
	121.01	ON SITE - HELIPORT PAD	0.2	5.3	0.0	0.0	5.3	80%	4.2	9.5	35%	3.3	10%	1.3	0.0	(0.1)	14.0
		SUBTOTAL 120 - ON SITE	60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9		$457.9	$0.0	$0.9	$5,037.0
	130.11	OFF SITE - ROADS (NEW)															
	130.13	OFF SITE - BRIDGES															
	130.21	OFF SITE - RAIL (NEW)															
	130.50	OFF SITE - UTILITIES															
	140.00	MONUMENTS															
		SUBTOTAL 130 - OFF SITE	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
4.3.1	TOTAL 100 - SITE		60.9	$1,607.7	$271.5	$0.0	$1,879.2		$1,512.1	$3,391.3		$1,186.9		$457.9	$0.0	$0.9	$5,037.0
	211.02	MHB I - BUILDING/STRUCTURES															
	211.03	MHB I - HOT CELL EQUIPMENT															
	211.04	MHB I - UTILITIES															
	211.05	MHB I - HVAC EQUIPMENT															
	211.06	MHB I - HANDL/PACK EQUIP															
	211.07	MHB I - SUPPORT FACILITIES															
		SUBTOTAL 211 - MHB I	0.0	$0.0	$0.0	$0.0	$0.0		$0.0	$0.0		$0.0		$0.0	$0.0	$0.0	$0.0
	212.02	MHB II - BUILDING/STRUCT	118.5	3,072.3	19.4	80.0	3,171.7	75%	2,304.2	5,475.9	35%	1,916.6	10%	739.3	813.2	(0.5)	8,944.5
	212.03	MHB II - HOT CELL EQUIP		INCLUDED ABOVE													
	212.04	MHB II - UTILITIES		INCLUDED ABOVE													
	212.05	MHB II - HVAC EQUIPMENT		INCLUDED ABOVE													
	212.06	MHB II - HANDL/PACK EQUIP		INCLUDED ABOVE													
	212.07	MHB II - SUPPORT FAC.		INCLUDED ABOVE													
		SUBTOTAL 212 - MHB II	118.5	$3,072.3	$19.4	$80.0	$3,171.7		$2,304.2	$5,475.9		$1,916.6		$739.3	$813.2	($0.5)	$8,944.5
	215.01	WASTE TREATMENT BUILDING	18.2	479.8	10.0	187.1	676.9	75%	359.9	1,036.8	35%	362.9	10%	140.0	154.0	0.3	1,694.0
	215.02	VEHICLE WASH FACILITY	0.9	23.7	0.0	0.0	23.7	75%	17.8	41.5	35%	14.5	10%	5.6	6.2	0.2	68.0
	215.03	DECONTAMINATION BUILDING	3.4	89.6	0.0	0.0	89.6	75%	67.2	156.8	35%	54.9	10%	21.2	23.3	(0.2)	256.0
	215.04	PERFORMANCE CONFIRM. FAC.	21.6	569.5	10.7	325.0	905.1	75%	427.1	1,332.2	35%	466.3	10%	179.9	197.8	(0.2)	2,176.0
		SUBTOTAL 215 - OTHER	44.1	$1,162.6	$20.7	$512.1	$1,695.4		$872.0	$2,567.4		$898.6		$346.7	$381.3	$0.1	$4,194.1
4.3.2.1	TOTAL 210 - WASTE HANDLING FAC.		162.6	$4,234.9	$40.1	$592.1	$4,867.1		$3,176.2	$8,043.3		$2,815.2		$1,086.0	$1,194.5	($0.4)	$13,138.6

TUFF REPOSITORY SURFACE FACILITIES
DEMOLITION COSTS ESTIMATE - MRS SYSTEM STUDY - CASE 9
(DOLLARS IN THOUSANDS - IIIQTR88)

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DAS CODE	WBS	DESCRIPTION	MANUAL HOURS	LABOR COST	MATERIAL COST	RADWASTE DISPOSAL COST	TOTAL DIRECT COST	INDIRECT COST @ %		SUBTOTAL	CONTINGENCY		CONSTRUCTION MANAGEMENT	PACKING & SORTING @ 10 %	ROUNDOFF ADJUSTMENT	TOTAL DEMOLITION COST
	220.10	HEALTH/MEDICAL FACILITIES	2.5	65.9	0.0	0.0	65.9	75%	49.4	115.3	35%	40.4	10% 15.6	17.1	0.6	189.0
	220.20	FIRE STATION	2.0	52.7	0.0	0.0	52.7	75%	39.5	92.2	35%	32.3	10% 12.5	13.7	0.3	151.0
	220.30	SECURITY FACILITIES	3.2	84.4	0.0	0.0	84.4	75%	63.3	147.7	35%	51.7	10% 19.9	21.9	(0.2)	241.0
	220.40	MAINTENANCE FACILITIES	8.1	213.5	0.0	0.0	213.5	75%	160.2	373.7	35%	130.8	10% 50.5	55.5	(0.5)	610.0
	220.50	ADMIN/PERSONNEL FACILITIES	12.6	332.2	0.0	0.0	332.2	75%	249.1	581.3	35%	203.4	10% 78.5	86.3	0.5	950.0
	220.60	MOCK-UP BUILDING	4.1	108.1	0.0	0.0	108.1	75%	81.1	189.2	35%	66.2	10% 25.5	28.1	0.0	309.0
	220.70	WAREHOUSE & RECEIVING FAC.	8.0	210.9	0.0	0.0	210.9	75%	158.2	369.1	35%	129.2	10% 49.8	54.8	0.1	603.0
	220.80	VISITOR CENTER FACILITY	1.0	26.4	0.0	0.0	26.4	75%	19.8	46.2	35%	16.2	10% 6.2	6.9	0.5	76.0
	220.90	STANDBY POWER GEN. FAC.	2.1	55.4	0.0	0.0	55.4	75%	41.5	96.9	35%	33.9	10% 13.1	14.4	(0.3)	158.0
	221.00	CHANGE HOUSE	2.8	73.8	0.0	0.0	73.8	75%	55.4	129.2	35%	45.2	10% 17.4	19.2		211.0
	221.10	EXPLOSIVE MAGAZINES	0.2	5.3	0.0	0.0	5.3	75%	4.0	9.3	35%	3.2	10% 1.2	1.4	(0.1)	15.0
	221.30	COOLING TOWER	0.3	7.9	0.0	0.0	7.9	100%	7.9	15.8	35%	5.5	10% 2.1	2.3	0.3	26.0
	221.41	SURFACE EXCV MATL HANDLING	3.8	100.2	0.0	0.0	100.2	75%	75.1	175.3	35%	61.3	10% 23.7	26.0	(0.3)	286.0
	221.90	SEWAGE FACILITY	1.8	47.5	0.0	0.0	47.5	100%	47.5	95.0	35%	33.2	10% 12.8	14.1	(0.1)	155.0
	222.20	MONOTORING FACILITY	4.6	121.3	0.0	0.0	121.3	75%	91.0	212.3	35%	74.3	10% 28.7	31.5	0.2	347.0
	222.30	STANDARD EQUIPMENT		0.0												
	222.42	BATCH PLANT	1.6	42.2	0.0	0.0	42.2	80%	33.7	75.9	35%	26.6	10% 10.2	11.3		124.0
4.3.2.2	TOTAL 220 - BALANCE OF PLANT		58.7	$1,547.5	$0.0	$0.0	$1,547.5		$1,176.7	$2,724.2		$953.4	$367.7	$404.5	$1.0	$4,450.8
4.3.2.3	230.12	M&M ACCESS - HOIST HOUSE	1.2	31.6	0.0	0.0	31.6	75%	23.7	55.3	35%	19.4	10% 7.5	8.2	0.2	90.6
4.3.3.1	230.13	SURFACE VENT. FACILITIES	7.7	203.0	0.0	0.0	203.0	75%	152.3	355.3	35%	124.4	10% 48.0	52.8	(0.3)	580.2
4.3.3.4	230.83	EXHAUST SHAFT FILTR. FAC.	27.0	711.8	0.0	0.0	711.8	75%	533.9	1,245.7	35%	436.0	10% 168.2	185.0	0.3	2,035.2
	TOTAL 230 - SURFACE SHAFT FAC.		35.9	$946.5	$0.0	$0.0	$946.5		$709.9	$1,656.4		$579.8	$223.7	$246.0	$0.2	$2,706.1
4.0	GRAND TOTAL SURFACE FACILITIES		318.1	$8,336.6	$311.7	$592.1	$9,240.4		$6,574.9	$15,815.3		$5,535.3	$2,135.3	$1,845.0	$1.7	$25,332.6

03-Nov-88

MRS SYSTEM STUDY - CASE 9
IMPLACEMENT CONTAINER COST ESTIMATE
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(MID 1988 DOLLARS)

WASTE TYPE		NUMBER of CONTAINERS	UNIT PRICE	EXTENTION ($1000s)	CONTINGENCY	TOTAL COSTS ($1000s)
WVHLW	DHLW	0	$0	$0	INCLUDED	$0
DHLW	DHLW	0	$0	$0	INCLUDED	$0
INTACT PWR		0	$0	$0	INCLUDED	$0
INTACT PWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED PWR		0	$0	$0	INCLUDED	$0
INTACT BWR and/or PWR/BWR MIXED		0	$0	$0	INCLUDED	$0
INTACT BWR - WESTERN UTILITIES		0	$0	$0	INCLUDED	$0
CONSOLIDATED BWR		0	$0	$0	INCLUDED	$0
PWR HARDWARE		0	$0	$0	INCLUDED	$0
BWR HARDWARE		0	$0	$0	INCLUDED	$0
PERF. CONFIRMATION 19 yrs. X 12 mo. X 1 Container/Mo.	3C	228	$28,000	$6,384	INCLUDED	$6,384
TOTAL EMPLACEMENT PHASE		228		$6,384	$0	$6,384
PERF. CONFIRMATION DURING CARETAKING 26 yrs. X 1 Container/Mo.	3C	312	$28,000	$8,736	INCLUDED	$8,736
TOTAL CONTAINER COSTS		540		$15,120	$0	$15,120
CONTACT HANDLED WASTE						$16,000
						$31,120

MRS STUDY CASES 8 AND 9
MANAGEMENT AND INTEGRATION COST ESTIMATE - UNDERGROUND FACILITIES
task:2605A138
FILE = ENG-8M9M.WK1 (RANGE=MGTINT)
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All costs are in thousands of dollars

				PROJECT PHASE WHERE COST IS ALLOCATED			
				PHASE 1	PHASE 2	PHASE 3	PHASE 4
02020	ARCHITECT-ENGINEER - SUBSURFACE						
		CONSTRUCTION		$37,107			
		EMPLACEMENT		$19,348			
		CARETAKER		$3,123			
		CLOSURE					$11,686
				$59,578	$0	$0	$11,686
01020	SUPPORT CONTRACTOR - SUBSURFACE						
	Assumed to be 25 % of A/E cost		25%	$14,894	$0	$0	$2,921
03020	CONSTRUCTION MANAGEMENT - SUBSURFACE			PHASE 1			
	Assumed to be 7 % of the total subsurface cost for phase 1.	* $318,045 =====>		$22,263			
		of which	85%	$18,924 is labor			
		and	15%	$3,339 is materials and equipment.			
		Labor converts to at $100k per FTE.		189.24 Man-years.			
04000	CONSULTANTS (SUBSURFACE PORTION OF TOTAL)			PHASE 1	PHASE 2	PHASE 3	PHASE 4
	Assumed to be $0.055 per labor man-hour per Weston Cost Estimating Guidelines for OGR Rod consolidation Study 1986.	TOTAL LABOR MAN-HRS			25,867,800 from p.21	5,105,100 from p.28 of prj2rpt	
		CONSULTANT COST			$1,423	$281	
11000	EMPLOYEE TRANSPORTATION				PHASE 2	PHASE 3	
	Applied during operations period (Phases 2 and 3)		DURATION		24.00	26.00	YEARS
	2000 man-hours per full time person (FTE)		PERSONS		539	106	FTE's
	Assumed to be 1 bus per 40 persons at an operating cost of $100,000 per bus per year for duration of phase.		40 PER BUS		$32,335	$6,913	COST FOR PHASE.

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 1 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	40.66	$1,666.30	$1,009.81	$857.44	$3,533.55
Ind. Labor & Material	13.42	$549.88	$0.00	$25.72	$575.60
State Sales Tax	0.00	$0.00	$37.87	$33.12	$70.99
QA/QC Impact	2.70	$110.81	$50.49	$44.16	$205.46
	56.78	$2,326.99	$1,098.17	$960.44	$4,385.60
Labor Contingency	17.03		Contractor Cost (0.15)		$657.84
			Contingency (0.30)		$1,513.02
Task 23011 Total	73.82				$6,556.46
Subject 23010 Total	73.82				$6,556.46
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.88	$109.47	$153.26	$28.25	$290.98
Ind. Labor & Material	0.62	$36.13	$0.00	$0.85	$36.98
State Sales Tax	0.00	$0.00	$5.75	$1.09	$6.84
QA/QC Impact	0.13	$7.28	$7.67	$1.46	$16.41
	2.63	$152.88	$166.68	$31.65	$351.21
Labor Contingency	0.79		Contractor Cost (0.15)		$52.69
			Contingency (0.30)		$121.17
Task 23085 Total	3.42				$525.07
Subject 23080 Total	3.42				$525.07
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	21.54	$751.41	$192.80	$291.79	$1,236.00
Ind. Labor & Material	7.11	$247.97	$0.00	$8.75	$256.72
State Sales Tax	0.00	$0.00	$7.23	$11.27	$18.50
QA/QC Impact	1.43	$49.97	$9.65	$15.03	$74.65
	30.08	$1,049.35	$209.68	$326.84	$1,585.87
Labor Contingency	7.52		Contractor Cost (0.15)		$237.89
			Contingency (0.25)		$455.94
Task 23105 Total	37.60				$2,279.70
Subject 23100 Total	37.60				$2,279.70
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	0.59	$19.29	$3.10	$12.44	$34.83
Ind. Labor & Material	0.19	$6.37	$0.00	$0.37	$6.74
State Sales Tax	0.00	$0.00	$0.12	$0.48	$0.60
QA/QC Impact	0.04	$1.28	$0.16	$0.64	$2.08
	0.82	$26.94	$3.38	$13.93	$44.25
Labor Contingency	0.21		Contractor Cost (0.15)		$6.63
			Contingency (0.25)		$12.72
Task 23115 Total	1.03				$63.60
Subject 23110 Total	1.03				$63.60
Category 23000 Total	115.86				$9,424.83
Area 20000 Total	115.86				$9,424.83
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	114.02	$8,435.46	$1,968.77	$1,463.47	$11,867.70
Ind. Labor & Material	37.63	$2,783.70	$0.00	$43.90	$2,827.60
State Sales Tax	0.00	$0.00	$73.83	$56.53	$130.36
QA/QC Impact	7.58	$560.96	$98.44	$75.37	$734.77
	159.22	$11,780.12	$2,141.04	$1,639.27	$15,560.43
Labor Contingency	47.77		Contractor Cost (0.15)		$2,334.07
			Contingency (0.30)		$5,368.35
Task 30010 Total	206.99				$23,262.85
Subject 30010 Total	206.99				$23,262.85
30020 Waste Handling Ramp					
30020 Waste Handling Ramp					
Direct Cost	42.66	$1,268.63	$2,499.86	$1,417.88	$5,186.37
Ind. Labor & Material	14.08	$418.65	$0.00	$42.52	$461.16
State Sales Tax	0.00	$0.00	$93.74	$54.77	$148.51
QA/QC Impact	2.84	$84.36	$125.00	$73.02	$282.38
	59.57	$1,771.64	$2,718.60	$1,588.21	$6,078.45
Labor Contingency	17.87		Contractor Cost (0.15)		$911.78
			Contingency (0.30)		$2,097.07
Task 30020 Total	77.44				$9,087.30
Subject 30020 Total	77.44				$9,087.30
30030 Tuff Ramp					
30030 Tuff Ramp					
Direct Cost	31.17	$924.44	$1,968.30	$1,097.47	$3,990.21
Ind. Labor & Material	10.29	$305.07	$0.00	$32.92	$337.99
State Sales Tax	0.00	$0.00	$73.81	$42.39	$116.20
QA/QC Impact	2.07	$61.48	$98.42	$56.52	$216.42
	43.53	$1,290.99	$2,140.53	$1,229.30	$4,660.82
Labor Contingency	13.06		Contractor Cost (0.15)		$699.12
			Contingency (0.30)		$1,607.98
Task 30030 Total	56.59				$6,967.92
Subject 30030 Total	56.59				$6,967.92

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	111.35	$8,271.38	$1,899.33	$1,444.29	$11,615.00
Ind. Labor & Material	36.75	$2,729.56	$0.00	$43.33	$2,772.88
State Sales Tax	0.00	$0.00	$71.22	$55.79	$127.01
QA/QC Impact	7.40	$550.05	$94.97	$74.38	$719.40
	155.50	$11,550.99	$2,065.52	$1,617.79	$15,234.30
Labor Contingency	46.65		Contractor Cost (0.15)		$2,285.14
			Contingency (0.30)		$5,255.84
Task 30080 Total	202.15				$22,775.28
Subject 30080 Total	202.15				$22,775.28
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	16.81	$1,098.60	$312.00	$235.73	$1,646.33
Ind. Labor & Material	5.55	$362.54	$0.00	$7.07	$369.61
State Sales Tax	0.00	$0.00	$11.70	$9.10	$20.80
QA/QC Impact	1.12	$73.06	$15.60	$12.14	$100.80
	23.48	$1,534.20	$339.30	$264.04	$2,137.54
Labor Contingency	5.87		Contractor Cost (0.15)		$320.63
			Contingency (0.25)		$614.54
Task 30106 Total	29.35				$3,072.71
Subject 30100 Total	29.35				$3,072.71
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	4.01	$111.11	$22.78	$91.11	$225.00
Ind. Labor & Material	1.32	$36.67	$0.00	$2.73	$39.40
State Sales Tax	0.00	$0.00	$0.85	$3.52	$4.37
QA/QC Impact	0.27	$7.39	$1.14	$4.69	$13.22
	5.60	$155.17	$24.77	$102.05	$281.99
Labor Contingency	1.40		Contractor Cost (0.15)		$42.30
			Contingency (0.25)		$81.08
Task 30116 Total	7.00				$405.37
Subject 30110 Total	7.00				$405.37
Category 30000 Total	579.53				$65,571.43
Area 30000 Total	579.53				$65,571.43
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41010 Common Facility (Shaft Pillar) Excavation					
41011 Main Drifts					
Direct Cost	37.12	$1,042.88	$1,049.82	$1,040.16	$3,132.86
Ind. Labor & Material	12.25	$344.15	$0.00	$31.20	$375.35
State Sales Tax	0.00	$0.00	$39.28	$40.18	$79.54
QA/QC Impact	2.47	$69.35	$52.49	$53.57	$175.41
	51.84	$1,456.38	$1,141.67	$1,165.11	$3,763.16
Labor Contingency	15.55		Contractor Cost (0.15)		$564.47
			Contingency (0.30)		$1,298.30
Task 41011 Total	67.39				$5,625.93
41012 Ventilation Drifts					
Direct Cost	23.33	$677.85	$1,479.62	$666.22	$2,823.69
Ind. Labor & Material	7.70	$223.69	$0.00	$19.99	$243.68
State Sales Tax	0.00	$0.00	$55.49	$25.73	$81.22
QA/QC Impact	1.55	$45.08	$73.98	$34.31	$153.37
	32.58	$946.62	$1,609.09	$746.25	$3,301.96
Labor Contingency	9.77		Contractor Cost (0.15)		$495.29
			Contingency (0.30)		$1,139.17
Task 41012 Total	42.35				$4,936.42
41013 Support Facilities					
Direct Cost	35.99	$996.66	$501.13	$921.49	$2,419.28
Ind. Labor & Material	11.88	$328.90	$0.00	$27.66	$356.57
State Sales Tax	0.00	$0.00	$18.80	$5.59	$24.38
QA/QC Impact	2.39	$66.28	$25.06	$47.46	$138.80
	50.26	$1,391.84	$544.99	$1,032.18	$2,969.01
Labor Contingency	15.08		Contractor Cost (0.15)		$445.35
			Contingency (0.30)		$1,024.32
Task 41013 Total	65.34				$4,438.68
41014 Training Areas					
Direct Cost	2.19	$60.53	$23.78	$43.12	$127.43
Ind. Labor & Material	0.72	$19.67	$0.00	$1.26	$21.26
State Sales Tax	0.00	$0.00	$0.89	$1.67	$2.56
QA/QC Impact	0.15	$4.03	$1.20	$2.22	$7.45
	3.05	$84.53	$25.87	$48.30	$158.70
Labor Contingency	0.92		Contractor Cost (0.15)		$23.80
			Contingency (0.30)		$54.75
Task 41014 Total	3.97				$237.25
41015 Performance Confirmation					
Direct Cost	2.19	$60.53	$12.28	$43.12	$115.93
Ind. Labor & Material	0.72	$19.67	$0.00	$1.26	$21.26
State Sales Tax	0.00	$0.00	$0.46	$1.67	$2.13
QA/QC Impact	0.15	$4.03	$0.62	$2.22	$6.87
	3.05	$84.53	$13.36	$48.30	$146.19
Labor Contingency	0.92		Contractor Cost (0.15)		$21.93
			Contingency (0.30)		$50.45
Task 41015 Total	3.97				$218.57
Subject 41010 Total	183.01				$15,456.85
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	52.95	$1,486.37	$3,116.55	$1,464.71	$6,067.63
Ind. Labor & Material	17.47	$490.50	$0.00	$43.94	$534.44

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
State Sales Tax	0.00	$0.00	$116.87	$56.57	$173.44
QA/QC Impact	3.52	$98.84	$155.83	$75.43	$330.10
	73.95	$2,075.71	$3,389.25	$1,640.65	$7,105.61
Labor Contingency	18.49		Contractor Cost (0.15)		$1,065.85
			Contingency (0.25)		$2,042.86
Task 41021 Total	92.43				$10,214.32
41022 Access Drifts					
Direct Cost	92.72	$2,567.63	$1,968.98	$2,459.02	$6,995.63
Ind. Labor & Material	30.60	$847.35	$0.00	$73.77	$921.09
State Sales Tax	0.00	$0.00	$73.84	$94.98	$168.82
QA/QC Impact	6.17	$170.75	$98.45	$126.64	$395.84
	129.49	$3,585.70	$2,141.27	$2,754.41	$8,481.38
Labor Contingency	32.37		Contractor Cost (0.15)		$1,272.20
			Contingency (0.25)		$2,438.40
Task 41022 Total	161.86				$12,191.98
41023 Ventilation Drifts					
Direct Cost	19.82	$559.68	$5,977.51	$461.68	$6,998.87
Ind. Labor & Material	6.54	$184.69	$0.00	$13.85	$198.54
State Sales Tax	0.00	$0.00	$224.16	$17.83	$241.99
QA/QC Impact	1.32	$37.22	$298.88	$23.78	$359.88
	27.68	$781.59	$6,500.55	$517.14	$7,799.28
Labor Contingency	6.92		Contractor Cost (0.15)		$1,169.89
			Contingency (0.25)		$2,242.30
Task 41023 Total	34.60				$11,211.47
41024 Emplacement Drifts					
Direct Cost	172.35	$4,772.57	$5,472.90	$3,485.47	$13,730.94
Ind. Labor & Material	56.88	$1,577.65	$0.00	$104.56	$1,679.51
State Sales Tax	0.00	$0.00	$205.23	$134.63	$339.86
QA/QC Impact	11.46	$317.38	$273.65	$179.50	$770.53
	240.69	$6,664.90	$5,951.78	$3,904.16	$16,520.84
Labor Contingency	60.17		Contractor Cost (0.15)		$2,478.13
			Contingency (0.25)		$4,749.75
Task 41024 Total	300.87				$23,748.72
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	74.79	$2,071.00	$6,840.60	$2,017.48	$10,929.08
Ind. Labor & Material	24.68	$683.43	$0.00	$60.52	$743.95
State Sales Tax	0.00	$0.00	$256.53	$77.05	$333.57
QA/QC Impact	4.97	$137.72	$342.02	$103.90	$583.64
	104.45	$2,892.15	$7,439.15	$2,259.82	$12,591.12
Labor Contingency	36.56		Contractor Cost (0.15)		$1,888.67
			Contingency (0.35)		$5,067.93
Task 41025 Total	141.01				$19,547.72
Subject 41020 Total	730.77				$76,914.21
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	0.00	$0.00	$3,180.85	$0.00	$3,180.85
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$119.28	$0.00	$119.28
QA/QC Impact	0.00	$0.00	$159.04	$0.00	$159.04
	0.00	$0.00	$3,459.17	$0.00	$3,459.17
Labor Contingency	0.00		Contractor Cost (0.15)		$518.88
			Contingency (0.35)		$1,392.31
Task 41035 Total	0.00				$5,370.36
Subject 41030 Total	0.00				$5,370.36
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	3.26	$90.29	$1,767.04	$87.96	$1,945.29
Ind. Labor & Material	1.08	$29.80	$0.00	$2.64	$32.44
State Sales Tax	0.00	$0.00	$66.27	$3.40	$69.67
QA/QC Impact	0.22	$6.00	$88.35	$4.53	$98.88
	4.55	$126.09	$1,921.66	$98.53	$2,146.28
Labor Contingency	1.59		Contractor Cost (0.15)		$321.84
			Contingency (0.35)		$865.88
Task 41045 Total	6.15				$3,332.10
Subject 41040 Total	6.15				$3,332.10
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	61.90	$1,869.91	$3,327.06	$2,121.39	$7,318.36
Ind. Labor & Material	20.43	$611.07	$0.00	$63.64	$680.71
State Sales Tax	0.00	$0.00	$124.76	$81.94	$206.70
QA/QC Impact	4.12	$124.35	$166.36	$109.25	$399.96
	86.44	$2,611.33	$3,618.18	$2,376.22	$8,605.73
Labor Contingency	25.93		Contractor Cost (0.15)		$1,290.86
			Contingency (0.30)		$2,968.98
Task 41060 Total	112.37				$12,865.57
Subject 41060 Total	112.37				$12,865.57
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	61.60	$1,705.62	$3,381.54	$112.73	$5,199.89
Ind. Labor & Material	20.33	$562.85	$0.00	$3.38	$566.23
State Sales Tax	0.00	$0.00	$126.80	$4.35	$131.15
QA/QC Impact	4.10	$113.42	$169.08	$5.81	$288.31
	86.02	$2,381.89	$3,677.42	$126.27	$6,185.58
Labor Contingency	21.51		Contractor Cost (0.15)		$927.83
			Contingency (0.25)		$1,778.36
Task 41070 Total	107.53				$8,891.77
Subject 41070 Total	107.53				$8,891.77
Category 41000 Total	1139.84				$122,830.86

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	1.11	$36.29	$6,079.28	$109.82	$6,225.39
Ind. Labor & Material	0.37	$11.68	$0.00	$3.29	$15.27
State Sales Tax	0.00	$0.00	$227.97	$4.24	$232.21
QA/QC Impact	0.07	$2.41	$303.96	$5.66	$312.03
	1.55	$50.68	$6,611.21	$123.01	$6,784.90
Labor Contingency	0.54			Contractor Cost (0.15)	$1,017.73
				Contingency (0.35)	$2,730.62
Task 42010 Total	2.09				$10,533.55
Subject 42010 Total	2.09				$10,533.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	0.00	$0.00	$3,732.49	$0.00	$3,732.49
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$139.97	$0.00	$139.97
QA/QC Impact	0.00	$0.00	$186.62	$0.00	$186.62
	0.00	$0.00	$4,059.08	$0.00	$4,059.08
Labor Contingency	0.00			Contractor Cost (0.15)	$608.86
				Contingency (0.35)	$1,633.78
Task 42020 Total	0.00				$6,301.72
Subject 42020 Total	0.00				$6,301.72
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	0.00	$0.00	$1,982.89	$0.00	$1,982.89
Ind. Labor & Material	0.00	$0.00	$0.00	$0.00	$0.00
State Sales Tax	0.00	$0.00	$74.36	$0.00	$74.36
QA/QC Impact	0.00	$0.00	$99.14	$0.00	$99.14
	0.00	$0.00	$2,156.39	$0.00	$2,156.39
Labor Contingency	0.00			Contractor Cost (0.15)	$323.47
				Contingency (0.35)	$867.94
Task 42030 Total	0.00				$3,347.78
Subject 42030 Total	0.00				$3,347.78
Category 42000 Total	2.09				$20,183.05
Area 40000 Total	1141.93				$143,013.91
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	116.15	$3,233.95	$990.69	$258.24	$4,482.88
Ind. Labor & Material	38.33	$1,067.20	$0.00	$7.75	$1,074.95
State Sales Tax	0.00	$0.00	$27.14	$6.97	$47.11
QA/QC Impact	7.72	$215.06	$49.53	$13.30	$277.89
	162.21	$4,516.21	$1,077.36	$289.26	$5,882.83
Labor Contingency	40.55			Contractor Cost (0.15)	$882.42
				Contingency (0.25)	$1,691.32
Task 51011 Total	202.76				$8,456.57
51012 Initial Equipment Inventory					
Direct Cost	0.00	$0.00	$0.00	$2,794.70	$2,794.70
Ind. Labor & Material	0.00	$0.00	$0.00	$83.84	$83.84
State Sales Tax	0.00	$0.00	$0.00	$107.95	$107.95
QA/QC Impact	0.00	$0.00	$0.00	$143.93	$143.93
	0.00	$0.00	$0.00	$3,130.42	$3,130.42
Labor Contingency	0.00			Contractor Cost (0.15)	$469.56
				Contingency (0.25)	$900.01
Task 51012 Total	0.00				$4,500.00
Subject 51010 Total	202.76				$12,956.57
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	500.98	$16,049.75	$2,167.46	$1,105.35	$19,322.56
Ind. Labor & Material	165.32	$5,296.42	$0.00	$33.16	$5,356.58
State Sales Tax	0.00	$0.00	$81.28	$42.69	$123.97
QA/QC Impact	33.32	$1,067.31	$108.38	$56.93	$1,232.62
	699.62	$22,413.48	$2,357.12	$1,238.13	$26,008.73
Labor Contingency	209.89			Contractor Cost (0.15)	$3,901.31
				Contingency (0.30)	$8,973.01
Task 51031 Total	909.51				$38,883.05
51032 Emplacement Area					
Direct Cost	4.86	$134.65	$406.56	$34.29	$575.50
Ind. Labor & Material	1.60	$44.43	$0.00	$1.03	$45.46
State Sales Tax	0.00	$0.00	$15.24	$1.32	$16.56
QA/QC Impact	0.32	$8.95	$20.33	$1.77	$31.05
	6.79	$188.03	$442.13	$38.41	$668.57
Labor Contingency	2.04			Contractor Cost (0.15)	$100.29
				Contingency (0.30)	$230.65
Task 51032 Total	8.83				$999.51
Subject 51030 Total	918.34				$39,882.56
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	47.48	$1,323.16	$217.48	$171.98	$1,712.62
Ind. Labor & Material	15.77	$436.64	$0.00	$5.16	$441.80
State Sales Tax	0.00	$0.00	$8.15	$6.64	$14.79
QA/QC Impact	3.18	$87.99	$10.88	$8.86	$107.73

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	66.73	$1,847.79	$236.51	$192.64	$2,276.94
Labor Contingency	16.68			Contractor Cost (0.15)	$341.54
				Contingency (0.25)	$654.62
Task 51040 Total	83.41				$3,273.10
Subject 51040 Total	83.41				$3,273.10
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	10.90	$301.77	$19.68	$208.18	$529.63
Ind. Labor & Material	3.60	$99.58	$0.00	$6.25	$105.83
State Sales Tax	0.00	$0.00	$0.74	$8.04	$8.78
QA/QC Impact	0.72	$20.07	$0.98	$10.72	$31.77
	15.22	$421.42	$21.40	$233.19	$676.01
Labor Contingency	4.57			Contractor Cost (0.15)	$101.40
				Contingency (0.30)	$233.22
Task 51050 Total	19.78				$1,010.63
Subject 51050 Total	19.78				$1,010.63
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	64.41	$1,783.54	$1,457.52	$539.73	$3,780.79
Ind. Labor & Material	21.26	$588.57	$0.00	$16.19	$604.76
State Sales Tax	0.00	$0.00	$54.65	$20.85	$75.50
QA/QC Impact	4.28	$118.61	$72.88	$27.80	$219.29
	89.95	$2,490.72	$1,585.05	$604.57	$4,680.34
Labor Contingency	26.98			Contractor Cost (0.15)	$702.05
				Contingency (0.30)	$1,614.71
Task 51060 Total	116.93				$6,997.10
Subject 51060 Total	116.93				$6,997.10
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	7.23	$200.10	$370.94	$119.41	$690.45
Ind. Labor & Material	2.38	$66.03	$0.00	$3.58	$69.61
State Sales Tax	0.00	$0.00	$13.21	$4.61	$18.52
QA/QC Impact	0.48	$13.31	$18.56	$6.15	$38.02
	10.09	$279.44	$403.41	$133.75	$816.60
Labor Contingency	2.52			Contractor Cost (0.15)	$122.49
				Contingency (0.25)	$234.77
Task 51070 Total	12.61				$1,173.86
Subject 51070 Total	12.61				$1,173.86
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.57	$53.28	$247.26	$2.79	$303.33
Ind. Labor & Material	0.52	$17.58	$0.00	$0.08	$17.66
State Sales Tax	0.00	$0.00	$9.27	$0.11	$9.38
QA/QC Impact	0.10	$3.54	$12.36	$0.14	$16.04
	2.19	$74.40	$268.89	$3.12	$346.41
Labor Contingency	0.55			Contractor Cost (0.15)	$51.97
				Contingency (0.25)	$99.60
Task 51080 Total	2.74				$497.98
Subject 51080 Total	2.74				$497.98
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	5.03	$171.29	$687.90	$91.40	$950.59
Ind. Labor & Material	1.66	$56.53	$0.00	$2.74	$59.27
State Sales Tax	0.00	$0.00	$25.80	$3.53	$29.33
QA/QC Impact	0.33	$11.39	$34.39	$4.71	$50.49
	7.02	$239.21	$748.09	$102.38	$1,089.68
Labor Contingency	1.76			Contractor Cost (0.15)	$163.45
				Contingency (0.25)	$313.29
Task 51090 Total	8.78				$1,566.42
Subject 51090 Total	8.78				$1,566.42
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	31.24	$864.93	$3,657.39	$234.96	$4,757.28
Ind. Labor & Material	10.31	$285.43	$0.00	$7.05	$292.48
State Sales Tax	0.00	$0.00	$137.15	$9.08	$146.23
QA/QC Impact	2.08	$57.52	$182.87	$12.10	$252.49
	43.62	$1,207.88	$3,977.41	$263.19	$5,448.48
Labor Contingency	13.09			Contractor Cost (0.15)	$817.26
				Contingency (0.30)	$1,879.73
Task 51100 Total	56.71				$8,145.47
Subject 51100 Total	56.71				$8,145.47
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	29.62	$830.61	$5.38	$89.76	$925.75
Ind. Labor & Material	9.78	$274.10	$0.00	$2.68	$276.79
State Sales Tax	0.00	$0.00	$0.20	$3.47	$3.67
QA/QC Impact	1.97	$55.24	$0.27	$4.62	$60.13
	41.37	$1,159.95	$5.85	$100.54	$1,266.34
Labor Contingency	10.34			Contractor Cost (0.15)	$189.95
				Contingency (0.25)	$364.08
Task 51110 Total	51.71				$1,820.37
Subject 51110 Total	51.71				$1,820.37
Category 51000 Total	1473.78				$77,324.06
52000 UTILITIES					
52010 Electrical					
52010 Electrical					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	36.68	$1,242.24	$2,883.45	$670.02	$4,795.71
Ind. Labor & Material	12.11	$409.64	$0.00	$20.10	$429.74
State Sales Tax	0.00	$0.00	$108.13	$25.88	$134.01
QA/QC Impact	2.44	$82.61	$144.17	$34.51	$261.29
	51.23	$1,734.79	$3,135.75	$750.51	$5,621.05
Labor Contingency	12.81		Contractor Cost (0.15)		$843.16
			Contingency (0.25)		$1,616.06
Task 52010 Total	64.04				$8,080.27
Subject 52010 Total	64.04				$8,080.27
52020 Communications					
52020 Communications					
Direct Cost	2.84	$96.75	$5.82	$19.63	$122.20
Ind. Labor & Material	0.64	$31.63	$0.00	$0.52	$32.52
State Sales Tax	0.00	$0.00	$0.22	$0.76	$0.98
QA/QC Impact	0.19	$6.43	$0.29	$1.01	$7.73
	3.96	$135.11	$6.33	$21.99	$163.43
Labor Contingency	1.19		Contractor Cost (0.15)		$24.52
			Contingency (0.30)		$56.36
Task 52020 Total	5.15				$244.34
Subject 52020 Total	5.15				$244.34
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	4.71	$130.32	$270.58	$277.30	$678.20
Ind. Labor & Material	1.55	$43.01	$0.00	$8.32	$51.33
State Sales Tax	0.00	$0.00	$10.15	$10.71	$20.86
QA/QC Impact	0.31	$8.67	$13.52	$14.28	$36.47
	6.57	$182.00	$294.25	$310.61	$786.86
Labor Contingency	1.97		Contractor Cost (0.15)		$118.03
			Contingency (0.30)		$271.47
Task 52040 Total	8.54				$1,176.36
Subject 52040 Total	8.54				$1,176.36
52050 Water					
52050 Water					
Direct Cost	4.42	$122.44	$12.17	$143.60	$278.21
Ind. Labor & Material	1.46	$40.41	$0.00	$4.31	$44.72
State Sales Tax	0.00	$0.00	$0.46	$5.55	$6.01
QA/QC Impact	0.29	$8.14	$0.61	$7.40	$16.15
	6.18	$170.99	$13.24	$160.86	$345.09
Labor Contingency	1.85		Contractor Cost (0.15)		$51.76
			Contingency (0.30)		$112.05
Task 52050 Total	8.03				$515.90
Subject 52050 Total	8.03				$515.90
Category 52000 Total	85.76				$10,016.87
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	67.35	$2,294.17	$2,251.28	$2,253.57	$6,799.02
Ind. Labor & Material	22.23	$757.08	$0.00	$67.61	$824.69
State Sales Tax	0.00	$0.00	$84.43	$87.04	$171.47
QA/QC Impact	4.48	$152.56	$112.56	$116.06	$381.18
	94.06	$3,203.81	$2,448.27	$2,524.28	$8,176.36
Labor Contingency	32.92		Contractor Cost (0.15)		$1,226.45
			Contingency (0.35)		$3,290.99
Task 53000 Total	126.98				$12,693.80
Subject 53000 Total	126.98				$12,693.80
Category 53000 Total	126.98				$12,693.80
Area 50000 Total	1686.51				$100,034.73

TOTAL LABOR HOURS AND COST FOR PHASE 1 OF PROJECT	3523.84 x 10^3 man-hrs	$318,044.90

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********** PROJECT PHASE 2 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	264.96	$8,674.56	$667.02	$3,894.97	$13,236.55
Ind. Labor & Material	87.44	$2,862.60	$0.00	$116.85	$2,979.45
State Sales Tax	0.00	$0.00	$23.01	$150.44	$175.45
QA/QC Impact	17.62	$576.86	$33.35	$200.59	$810.80
	370.02	$12,114.02	$725.38	$4,362.85	$17,202.25
Labor Contingency	111.00		Contractor Cost (0.15)		$2,580.34
			Contingency (0.30)		$5,234.78
Task 23011 Total	481.02				$25,017.37
Subject 23010 Total	481.02				$25,717.37
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.72	$3.35
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.35		Contractor Cost (0.15)		$36.21
			Contingency (0.30)		$83.28
Task 23085 Total	5.84				$360.85
Subject 23080 Total	5.84				$360.85
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.72	$3.35
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23105 Total	5.61				$346.96
Subject 23100 Total	5.61				$346.96
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.22	$105.23	$16.90	$67.86	$189.99
Ind. Labor & Material	1.06	$34.73	$0.00	$2.04	$36.77
State Sales Tax	0.00	$0.00	$0.63	$2.72	$3.35
QA/QC Impact	0.21	$7.00	$0.85	$3.50	$11.35
	4.49	$146.96	$18.38	$76.02	$241.36
Labor Contingency	1.12		Contractor Cost (0.15)		$36.21
			Contingency (0.25)		$69.39
Task 23115 Total	5.61				$346.96
Subject 23110 Total	5.61				$346.96
Category 23000 Total	498.09				$26,772.14
Area 20000 Total	498.09				$26,772.14
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	53.98	$1,494.60	$306.40	$1,225.65	$3,026.65
Ind. Labor & Material	17.81	$493.22	$0.00	$36.77	$529.99
State Sales Tax	0.00	$0.00	$11.49	$47.34	$58.83
QA/QC Impact	3.59	$99.39	$15.32	$63.12	$177.83
	75.38	$2,087.21	$333.21	$1,372.88	$3,793.30
Labor Contingency	22.61		Contractor Cost (0.15)		$568.99
			Contingency (0.30)		$1,308.70
Task 30010 Total	97.99				$5,670.99
Subject 30010 Total	97.99				$5,670.99
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	43.82	$1,213.49	$248.85	$995.44	$2,457.78
Ind. Labor & Material	14.46	$400.45	$0.00	$29.86	$430.31
State Sales Tax	0.00	$0.00	$9.33	$37.45	$47.78
QA/QC Impact	2.91	$80.70	$12.44	$51.26	$144.40
	61.20	$1,694.64	$270.62	$1,115.01	$3,080.27
Labor Contingency	18.36		Contractor Cost (0.15)		$462.05
			Contingency (0.30)		$1,062.71
Task 30080 Total	79.56				$4,605.03
Subject 30080 Total	79.56				$4,605.03
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.22	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$4.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64		Contractor Cost (0.15)		$230.73
			Contingency (0.25)		$472.22
Task 30106 Total	38.21				$2,211.11
Subject 30100 Total	38.21				$2,211.11

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	21.89	$606.08	$124.24	$496.96	$1,227.28
Ind. Labor & Material	7.66	$200.01	$0.00	$14.91	$214.92
State Sales Tax	0.00	$0.00	$7.66	$19.20	$23.86
QA/QC Impact	1.46	$40.30	$6.21	$25.59	$72.10
	30.57	$846.39	$135.11	$556.66	$1,538.16
Labor Contingency	7.64			Contractor Cost (0.15)	$230.73
				Contingency (0.25)	$442.27
Task 30116 Total	38.21				$2,211.11
Subject 30110 Total	38.21				$2,211.11
Category 30000 Total	253.97				$14,698.24
Area 30000 Total	253.97				$14,698.24
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41020 Spent Fuel Facility Excavation					
41021 Main Drifts					
Direct Cost	119.40	$3,351.50	$1,528.74	$3,302.65	$8,182.89
Ind. Labor & Material	39.40	$1,106.00	$0.00	$99.08	$1,205.08
State Sales Tax	0.00	$0.00	$57.33	$130.56	$187.89
QA/QC Impact	7.84	$222.88	$76.43	$170.09	$469.40
	166.74	$4,680.38	$1,662.50	$3,699.38	$10,042.26
Labor Contingency	41.68			Contractor Cost (0.15)	$1,506.33
				Contingency (0.25)	$2,887.15
Task 41021 Total	208.42				$14,435.74
41022 Access Drifts					
Direct Cost	394.87	$10,934.30	$5,275.98	$10,471.79	$26,682.07
Ind. Labor & Material	130.31	$3,608.32	$0.00	$314.15	$3,922.47
State Sales Tax	0.00	$0.00	$197.85	$404.47	$602.32
QA/QC Impact	26.26	$727.13	$263.80	$539.30	$1,530.23
	551.44	$15,269.75	$5,737.63	$11,729.71	$32,737.09
Labor Contingency	137.86			Contractor Cost (0.15)	$4,910.56
				Contingency (0.25)	$9,411.21
Task 41022 Total	689.30				$47,059.56
41023 Ventilation Drifts					
Direct Cost	177.21	$5,086.79	$3,319.89	$4,679.19	$13,085.87
Ind. Labor & Material	58.48	$1,678.64	$0.00	$140.38	$1,819.02
State Sales Tax	0.00	$0.00	$124.49	$180.73	$305.22
QA/QC Impact	11.78	$338.27	$165.99	$240.98	$745.24
	247.47	$7,103.70	$3,610.37	$5,241.28	$15,955.35
Labor Contingency	61.87			Contractor Cost (0.15)	$2,393.30
				Contingency (0.25)	$4,587.17
Task 41023 Total	309.34				$22,935.82
41024 Emplacement Drifts					
Direct Cost	1792.65	$49,639.36	$11,184.96	$36,252.30	$97,076.62
Ind. Labor & Material	591.58	$16,380.27	$0.00	$1,087.57	$17,468.56
State Sales Tax	0.00	$0.00	$419.44	$1,400.25	$1,819.69
QA/QC Impact	119.21	$3,301.02	$559.25	$1,866.99	$5,727.26
	2503.44	$69,321.37	$12,163.65	$40,607.11	$122,092.13
Labor Contingency	625.86			Contractor Cost (0.15)	$18,313.81
				Contingency (0.25)	$35,101.49
Task 41024 Total	3129.30				$175,507.43
41025 Emplacement Borehole Drilling/Lining					
Direct Cost	1199.66	$33,217.56	$28,407.83	$32,359.08	$93,984.47
Ind. Labor & Material	395.88	$10,961.79	$0.00	$970.77	$11,932.56
State Sales Tax	0.00	$0.00	$1,065.29	$1,249.87	$2,315.16
QA/QC Impact	79.78	$2,208.97	$1,420.39	$1,666.49	$5,295.85
	1675.33	$46,388.32	$30,893.51	$36,246.21	$113,528.04
Labor Contingency	586.37			Contractor Cost (0.15)	$17,029.20
				Contingency (0.35)	$45,695.03
Task 41025 Total	2261.70				$176,252.27
Subject 41020 Total	6598.06				$436,190.82
41030 DHLW Facility Excavation					
41035 Emplacement Borehole Drilling/Lining					
Direct Cost	610.36	$16,900.42	$14,028.01	$17,989.87	$48,918.30
Ind. Labor & Material	201.42	$5,577.14	$0.00	$539.70	$6,116.84
State Sales Tax	0.00	$0.00	$526.05	$694.86	$1,220.91
QA/QC Impact	40.59	$1,123.88	$701.40	$926.48	$2,751.76
	852.37	$23,601.44	$15,255.46	$20,150.91	$59,007.81
Labor Contingency	298.33			Contractor Cost (0.15)	$8,851.18
				Contingency (0.35)	$23,750.65
Task 41035 Total	1150.71				$91,609.64
Subject 41030 Total	1150.71				$91,609.64
41040 Other Waste Facility Excavation					
41045 Emplacement Borehole Drilling/Lining					
Direct Cost	65.20	$1,805.27	$1,533.83	$1,794.73	$5,133.83
Ind. Labor & Material	21.52	$595.74	$0.00	$53.84	$649.58
State Sales Tax	0.00	$0.00	$57.52	$68.32	$126.84
QA/QC Impact	4.34	$120.05	$76.70	$92.43	$289.18
	91.05	$2,521.06	$1,668.05	$2,010.32	$6,199.43
Labor Contingency	31.87			Contractor Cost (0.15)	$962.22
				Contingency (0.35)	$2,462.97
Task 41045 Total	122.92				$9,624.62
Subject 41040 Total	122.92				$9,624.62
41060 Excavated Material Handling					
41060 Excavated Material Handling					
Direct Cost	170.18	$5,127.43	$9,718.69	$3,067.73	$17,913.85
Ind. Labor & Material	56.16	$1,692.05	$0.00	$92.03	$1,784.08

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT (All costs in thousands of dollars)	MATERIALS	TOTAL
State Sales Tax	0.00	$0.00	$364.45	$118.49	$482.94
QA/QC Impact	11.32	$340.97	$485.94	$157.99	$984.90
	237.65	$7,160.45	$10,569.08	$3,436.24	$21,165.77
Labor Contingency	71.30		Contractor Cost (0.15)		$3,174.87
			Contingency (0.30)		$7,302.19
Task 41060 Total	308.95				$31,642.83
Subject 41060 Total	308.95				$31,642.83
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	720.00	$19,937.28	$6,786.00	$9,501.84	$36,225.12
Ind. Labor & Material	237.60	$6,579.30	$0.00	$285.06	$6,864.36
State Sales Tax	0.00	$0.00	$254.48	$367.01	$621.49
QA/QC Impact	47.88	$1,325.83	$339.30	$489.34	$2,154.47
	1005.48	$27,842.41	$7,379.78	$10,643.25	$45,865.44
Labor Contingency	251.37		Contractor Cost (0.15)		$6,879.81
			Contingency (0.25)		$13,186.31
Task 41070 Total	1256.85				$65,931.56
Subject 41070 Total	1256.85				$65,931.56
Category 41000 Total	9437.48				$634,999.47
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42010 Spent Fuel Waste Transport and Emplacement					
42010 Spent Fuel Waste Transport and Emplacement					
Direct Cost	268.52	$8,791.48	$31,649.46	$26,608.42	$67,049.36
Ind. Labor & Material	88.61	$2,901.18	$0.00	$798.25	$3,699.44
State Sales Tax	0.00	$0.00	$1,186.86	$1,027.75	$2,214.61
QA/QC Impact	17.86	$584.63	$1,582.47	$1,370.33	$3,537.43
	374.99	$12,277.30	$34,418.79	$29,804.75	$76,500.84
Labor Contingency	131.25		Contractor Cost (0.15)		$11,475.12
			Contingency (0.35)		$30,791.59
Task 42010 Total	506.24				$118,767.55
Subject 42010 Total	506.24				$118,767.55
42020 DHLW Transport and Emplacement					
42020 DHLW Transport and Emplacement					
Direct Cost	140.32	$4,600.73	$16,562.75	$13,924.67	$35,088.15
Ind. Labor & Material	46.37	$1,518.24	$0.00	$417.24	$1,935.48
State Sales Tax	0.00	$0.00	$621.10	$537.84	$1,158.94
QA/QC Impact	9.34	$305.95	$828.14	$717.12	$1,851.21
	196.24	$6,424.92	$18,011.99	$15,597.37	$40,034.28
Labor Contingency	68.68		Contractor Cost (0.15)		$6,005.14
			Contingency (0.35)		$16,113.79
Task 42020 Total	264.92				$62,153.21
Subject 42020 Total	264.92				$62,153.21
42030 Other Waste Transport and Emplacement					
42030 Other Waste Transport and Emplacement					
Direct Cost	14.71	$481.48	$1,733.34	$1,457.26	$3,672.08
Ind. Labor & Material	4.85	$158.89	$0.00	$43.22	$202.11
State Sales Tax	0.00	$0.00	$65.00	$56.21	$121.29
QA/QC Impact	0.98	$32.02	$86.66	$75.05	$193.73
	20.54	$672.39	$1,885.00	$1,632.32	$4,189.71
Labor Contingency	7.19		Contractor Cost (0.15)		$628.45
			Contingency (0.35)		$1,686.36
Task 42030 Total	27.73				$6,504.52
Subject 42030 Total	27.73				$6,504.52
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	8.85	$289.69	$651.33	$0.00	$941.02
Ind. Labor & Material	2.92	$95.60	$0.00	$0.00	$95.60
State Sales Tax	0.00	$0.00	$24.42	$0.00	$24.42
QA/QC Impact	0.59	$19.26	$32.57	$0.00	$51.83
	12.36	$404.55	$708.32	$0.00	$1,112.87
Labor Contingency	4.94		Contractor Cost (0.15)		$166.92
			Contingency (0.40)		$511.92
Task 42040 Total	17.30				$1,791.71
Subject 42040 Total	17.30				$1,791.71
Category 42000 Total	816.19				$189,216.99
Area 40000 Total	10253.67				$824,216.46
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	673.85	$18,659.94	$2,569.23	$1,377.71	$22,606.88
Ind. Labor & Material	225.37	$6,157.78	$0.00	$41.33	$6,199.11
State Sales Tax	0.00	$0.00	$96.35	$53.21	$149.56
QA/QC Impact	44.81	$1,240.89	$128.47	$70.95	$1,440.31
	941.04	$26,058.61	$2,794.05	$1,543.20	$30,395.86
Labor Contingency	235.26		Contractor Cost (0.15)		$4,559.38
			Contingency (0.25)		$8,738.82
Task 51011 Total	1176.29				$43,694.06
Subject 51010 Total	1176.29				$43,694.06
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	3138.52	$100,722.58	$4,300.61	$6,403.89	$111,427.08
Ind. Labor & Material	1035.71	$33,238.45	$0.00	$192.12	$33,430.57
State Sales Tax	0.00	$0.00	$161.28	$247.35	$408.63
QA/QC Impact	208.71	$6,698.05	$215.03	$329.80	$7,242.88

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	4382.95	$140,659.08	$4,676.92	$7,173.16	$152,509.16
				Contractor Cost (0.15)	$22,876.37
Labor Contingency	1314.89			Contingency (0.30)	$52,615.66
Task 51031 Total	5697.84				$228,001.19
51032 Emplacement Area					
Direct Cost	1637.56	$52,615.97	$1,307.97	$3,390.11	$57,314.05
Ind. Labor & Material	540.39	$17,363.27	$0.00	$101.70	$17,464.97
State Sales Tax	0.00	$0.00	$49.05	$130.64	$179.69
QA/QC Impact	108.90	$3,498.96	$65.40	$174.59	$3,738.95
	2286.85	$73,478.20	$1,422.42	$3,797.34	$78,697.96
				Contractor Cost (0.15)	$11,804.70
Labor Contingency	686.05			Contingency (0.30)	$27,150.81
Task 51032 Total	2972.90				$117,653.47
Subject 51030 Total	8670.74				$345,654.66
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	248.72	$6,887.17	$386.40	$845.18	$8,118.75
Ind. Labor & Material	82.08	$2,272.77	$0.00	$25.36	$2,298.13
State Sales Tax	0.00	$0.00	$14.49	$32.75	$47.24
QA/QC Impact	16.54	$458.00	$19.32	$43.53	$520.85
	347.34	$9,617.94	$420.21	$946.72	$10,984.87
				Contractor Cost (0.15)	$1,647.73
Labor Contingency	86.84			Contingency (0.25)	$3,158.15
Task 51040 Total	434.18				$15,790.75
Subject 51040 Total	434.18				$15,790.75
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	283.06	$7,838.05	$1,378.01	$2,905.45	$12,121.51
Ind. Labor & Material	93.41	$2,586.56	$0.00	$87.16	$2,673.72
State Sales Tax	0.00	$0.00	$51.68	$112.22	$163.90
QA/QC Impact	18.82	$521.23	$68.90	$149.63	$739.76
	395.30	$10,945.84	$1,498.59	$3,254.46	$15,698.89
				Contractor Cost (0.15)	$2,357.84
Labor Contingency	118.59			Contingency (0.30)	$5,412.12
Task 51050 Total	513.88				$23,469.85
Subject 51050 Total	513.88				$23,469.85
51060 Ventilation System (Development)					
51060 Ventilation System (Development)					
Direct Cost	367.44	$10,174.44	$6,507.66	$2,816.81	$19,498.91
Ind. Labor & Material	121.66	$3,357.57	$0.00	$84.50	$3,442.07
State Sales Tax	0.00	$0.00	$244.04	$108.80	$352.84
QA/QC Impact	24.43	$676.60	$325.38	$145.07	$1,147.05
	513.13	$14,208.61	$7,077.08	$3,155.18	$24,440.87
				Contractor Cost (0.15)	$3,666.14
Labor Contingency	153.94			Contingency (0.30)	$8,432.10
Task 51060 Total	667.07				$36,539.11
Subject 51060 Total	667.07				$36,539.11
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	28.03	$776.49	$2,508.17	$1,093.25	$4,377.91
Ind. Labor & Material	9.22	$256.24	$0.00	$32.80	$289.04
State Sales Tax	0.00	$0.00	$84.06	$42.23	$136.29
QA/QC Impact	1.86	$51.64	$125.41	$56.30	$233.35
	39.15	$1,084.37	$2,727.64	$1,224.58	$5,036.59
				Contractor Cost (0.15)	$753.42
Labor Contingency	9.79			Contingency (0.25)	$1,448.02
Task 51070 Total	48.93				$7,240.10
Subject 51070 Total	48.93				$7,240.10
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	1.54	$50.29	$494.11	$8.74	$553.14
Ind. Labor & Material	0.51	$16.60	$0.00	$0.26	$16.86
State Sales Tax	0.00	$0.00	$18.53	$0.34	$18.87
QA/QC Impact	0.10	$3.34	$24.70	$0.45	$28.49
	2.15	$70.23	$537.34	$9.79	$617.36
				Contractor Cost (0.15)	$92.60
Labor Contingency	0.54			Contingency (0.25)	$177.49
Task 51080 Total	2.68				$887.45
Subject 51080 Total	2.68				$887.45
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.73	$93.12	$2,193.87	$293.54	$2,580.53
Ind. Labor & Material	0.90	$30.73	$0.00	$8.81	$39.54
State Sales Tax	0.00	$0.00	$82.27	$11.34	$93.61
QA/QC Impact	0.18	$6.19	$109.69	$15.12	$131.00
	3.82	$130.04	$2,385.83	$328.81	$2,844.68
				Contractor Cost (0.15)	$426.70
Labor Contingency	0.95			Contingency (0.25)	$817.84
Task 51090 Total	4.77				$4,089.22
Subject 51090 Total	4.77				$4,089.22
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	340.06	$11,202.92	$1,986.01	$2,339.55	$15,528.48
Ind. Labor & Material	112.22	$3,696.66	$0.00	$70.19	$3,767.15
State Sales Tax	0.00	$0.00	$74.47	$90.37	$164.84
QA/QC Impact	22.61	$744.99	$99.30	$120.49	$964.78

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	474.90	$15,644.87	$2,159.78	$2,620.60	$20,425.25
Labor Contingency	142.47			Contractor Cost (0.15)	$3,063.79
				Contingency (0.30)	$7,046.72
Task 51100 Total	617.37				$30,535.76
Subject 51100 Total	617.37				$30,535.76
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	337.20	$9,344.87	$4.87	$694.95	$10,044.69
Ind. Labor & Material	111.28	$3,083.81	$0.00	$20.85	$3,104.66
State Sales Tax	0.00	$0.00	$0.18	$26.84	$27.02
QA/QC Impact	22.42	$621.43	$0.24	$35.79	$657.46
	470.90	$13,050.11	$5.29	$778.43	$13,833.83
Labor Contingency	117.73			Contractor Cost (0.15)	$2,075.07
				Contingency (0.25)	$3,977.23
Task 51110 Total	588.63				$19,886.13
Subject 51110 Total	588.63				$19,886.13
Category 51000 Total	12724.55				$527,787.09
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	107.83	$3,667.73	$7,084.99	$1,367.74	$12,120.46
Ind. Labor & Material	35.58	$1,210.35	$0.00	$41.03	$1,251.38
State Sales Tax	0.00	$0.00	$265.69	$52.83	$318.52
QA/QC Impact	7.17	$243.90	$354.25	$70.44	$668.59
	150.58	$5,121.98	$7,704.93	$1,532.04	$14,358.95
Labor Contingency	37.64			Contractor Cost (0.15)	$2,153.85
				Contingency (0.25)	$4,128.19
Task 52010 Total	188.22				$20,640.99
Subject 52010 Total	188.22				$20,640.99
52020 Communications					
52020 Communications					
Direct Cost	20.19	$687.98	$17.19	$75.70	$780.87
Ind. Labor & Material	6.66	$227.03	$0.00	$2.27	$229.30
State Sales Tax	0.00	$0.00	$0.64	$2.92	$3.56
QA/QC Impact	1.34	$45.75	$0.86	$3.90	$50.51
	28.19	$960.76	$18.69	$84.79	$1,064.24
Labor Contingency	8.46			Contractor Cost (0.15)	$159.62
				Contingency (0.30)	$367.17
Task 52020 Total	36.65				$1,591.05
Subject 52020 Total	36.65				$1,591.05
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	39.91	$1,105.15	$1,000.64	$857.51	$2,963.30
Ind. Labor & Material	13.17	$364.70	$0.00	$25.73	$390.43
State Sales Tax	0.00	$0.00	$37.53	$33.12	$70.65
QA/QC Impact	2.65	$73.49	$50.03	$44.16	$167.68
	55.74	$1,543.34	$1,088.20	$960.52	$3,592.06
Labor Contingency	16.72			Contractor Cost (0.15)	$538.81
				Contingency (0.30)	$1,239.27
Task 52040 Total	72.46				$5,370.14
Subject 52040 Total	72.46				$5,370.14
52050 Water					
52050 Water					
Direct Cost	14.28	$395.22	$39.36	$371.39	$805.97
Ind. Labor & Material	4.71	$130.42	$0.00	$11.14	$141.56
State Sales Tax	0.00	$0.00	$1.47	$14.34	$15.81
QA/QC Impact	0.95	$26.28	$1.97	$19.13	$47.38
	19.94	$551.92	$42.80	$416.00	$1,010.72
Labor Contingency	5.98			Contractor Cost (0.15)	$151.61
				Contingency (0.30)	$348.70
Task 52050 Total	25.92				$1,511.03
Subject 52050 Total	25.92				$1,511.03
Category 52000 Total	323.25				$29,113.21
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	962.34	$31,410.07	$8,017.41	$18,101.20	$57,528.68
Ind. Labor & Material	317.57	$10,365.32	$0.00	$243.04	$10,608.36
State Sales Tax	0.00	$0.00	$300.65	$699.16	$999.81
QA/QC Impact	64.00	$2,088.77	$400.88	$932.21	$3,421.86
	1343.91	$43,864.16	$8,718.94	$20,275.61	$72,858.71
Labor Contingency	470.37			Contractor Cost (0.15)	$10,928.80
				Contingency (0.35)	$29,325.62
Task 53000 Total	1814.27				$113,113.13
Subject 53000 Total	1814.27				$113,113.13
Category 53000 Total	1814.27				$113,113.13
Area 50000 Total	14862.08				$670,013.43

* TOTAL LABOR HOURS AND COST FOR PHASE 2 OF PROJECT. 25867.80 x 10^3 man-hrs $1,535,700.27 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 3 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	143.52	$4,698.72	$578.10	$2,133.86	$7,410.68
Ind. Labor & Material	47.36	$1,550.58	$0.00	$64.02	$1,614.60
State Sales Tax	0.00	$0.00	$21.88	$82.22	$104.10
QA/QC Impact	9.54	$312.46	$28.91	$109.89	$451.26
	200.43	$6,561.76	$628.69	$2,390.19	$9,580.64
Labor Contingency	60.13		Contractor Cost (0.15)		$1,437.10
			Contingency (0.30)		$3,305.33
Task 23011 Total	260.55				$14,323.07
Subject 23010 Total	260.55				$14,323.07
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$5.21	$42.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.46		Contractor Cost (0.15)		$39.21
			Contingency (0.30)		$90.21
Task 23085 Total	6.33				$390.89
Subject 23080 Total	6.33				$390.89
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$5.21	$42.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23105 Total	6.08				$375.85
Subject 23100 Total	6.08				$375.85
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	3.48	$114.00	$18.31	$73.51	$205.82
Ind. Labor & Material	1.15	$37.62	$0.00	$5.21	$42.83
State Sales Tax	0.00	$0.00	$0.69	$2.84	$3.53
QA/QC Impact	0.23	$7.58	$0.92	$3.79	$12.29
	4.87	$159.20	$19.92	$82.35	$261.47
Labor Contingency	1.22		Contractor Cost (0.15)		$39.21
			Contingency (0.25)		$75.17
Task 23115 Total	6.08				$375.85
Subject 23110 Total	6.08				$375.85
Category 23000 Total	279.04				$15,465.66
Area 20000 Total	279.04				$15,465.66
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	58.47	$1,619.15	$331.94	$1,327.78	$3,278.87
Ind. Labor & Material	19.30	$534.32	$0.00	$39.83	$574.17
State Sales Tax	0.00	$0.00	$12.45	$51.29	$63.74
QA/QC Impact	3.89	$107.67	$16.60	$68.38	$192.65
	81.66	$2,261.14	$360.99	$1,487.28	$4,109.41
Labor Contingency	24.50		Contractor Cost (0.15)		$616.41
			Contingency (0.30)		$1,417.75
Task 30010 Total	106.16				$6,143.57
Subject 30010 Total	106.16				$6,143.57
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	47.48	$1,314.61	$269.58	$1,078.39	$2,662.58
Ind. Labor & Material	15.67	$433.82	$0.00	$32.35	$466.17
State Sales Tax	0.00	$0.00	$10.11	$41.65	$51.76
QA/QC Impact	3.16	$87.42	$13.48	$55.54	$156.44
	66.30	$1,835.85	$293.17	$1,207.93	$3,336.95
Labor Contingency	19.89		Contractor Cost (0.15)		$500.55
			Contingency (0.30)		$1,151.42
Task 30080 Total	86.19				$4,988.75
Subject 30080 Total	86.19				$4,988.75
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	23.71	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$248.62
			Contingency (0.25)		$479.08
Task 30106 Total	41.39				$2,395.36
Subject 30100 Total	41.39				$2,395.36

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	23.11	$656.59	$134.59	$538.37	$1,329.55
Ind. Labor & Material	7.82	$216.67	$0.00	$16.15	$232.82
State Sales Tax	0.00	$0.00	$5.05	$20.79	$25.84
QA/QC Impact	1.58	$43.66	$6.73	$27.73	$78.12
	33.11	$916.92	$146.37	$603.04	$1,666.33
Labor Contingency	8.28		Contractor Cost (0.15)		$249.95
			Contingency (0.25)		$479.08
Task 30116 Total	41.39				$2,395.36
Subject 30110 Total	41.39				$2,395.36
Category 30000 Total	275.13				$15,923.04
Area 30000 Total	275.13				$15,923.04
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	416.00	$11,519.04	$3,642.21	$7,832.76	$22,994.01
Ind. Labor & Material	137.28	$3,801.28	$0.00	$234.98	$4,036.26
State Sales Tax	0.00	$0.00	$136.58	$302.57	$439.15
QA/QC Impact	27.66	$766.02	$182.11	$403.39	$1,351.52
	580.94	$16,086.34	$3,960.90	$8,773.67	$28,820.91
Labor Contingency	145.24		Contractor Cost (0.15)		$4,323.14
			Contingency (0.25)		$8,286.02
Task 41070 Total	726.18				$41,430.07
Subject 41070 Total	726.18				$41,430.07
Category 41000 Total	726.18				$41,430.07
42000 EMPLACEMENT/RETRIEVAL OPERATIONS					
42040 Selective Waste Retrieval					
42040 Selective Waste Retrieval					
Direct Cost	12.11	$396.43	$891.29	$0.00	$1,287.72
Ind. Labor & Material	4.00	$130.82	$0.00	$0.00	$130.82
State Sales Tax	0.00	$0.00	$33.43	$0.00	$33.43
QA/QC Impact	0.81	$26.36	$44.56	$0.00	$70.92
	16.91	$553.61	$969.28	$0.00	$1,522.89
Labor Contingency	6.76		Contractor Cost (0.15)		$228.23
			Contingency (0.40)		$700.53
Task 42040 Total	23.67				$2,451.85
Subject 42040 Total	23.67				$2,451.85
Category 42000 Total	23.67				$2,451.85
Area 40000 Total	749.85				$43,881.92
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	314.01	$8,694.85	$430.85	$661.04	$9,786.74
Ind. Labor & Material	103.62	$2,869.30	$0.00	$19.83	$2,889.13
State Sales Tax	0.00	$0.00	$16.16	$25.53	$41.69
QA/QC Impact	20.88	$578.21	$21.54	$34.04	$633.79
	438.51	$12,142.36	$468.55	$740.44	$13,351.35
Labor Contingency	109.63		Contractor Cost (0.15)		$2,002.70
			Contingency (0.25)		$3,838.53
Task 51011 Total	548.14				$19,192.58
Subject 51010 Total	548.14				$19,192.58
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	332.07	$10,508.00	$552.30	$947.15	$12,007.45
Ind. Labor & Material	109.58	$3,467.64	$0.00	$28.41	$3,496.05
State Sales Tax	0.00	$0.00	$20.71	$36.58	$57.29
QA/QC Impact	22.08	$698.78	$27.62	$48.78	$775.18
	463.73	$14,674.42	$600.63	$1,060.92	$16,335.97
Labor Contingency	139.12		Contractor Cost (0.15)		$2,450.40
			Contingency (0.30)		$5,635.91
Task 51031 Total	602.85				$24,422.28
51032 Emplacement Area					
Direct Cost	120.42	$3,859.76	$272.32	$306.53	$4,438.61
Ind. Labor & Material	39.74	$1,273.72	$0.00	$9.20	$1,282.92
State Sales Tax	0.00	$0.00	$10.21	$11.84	$22.05
QA/QC Impact	8.01	$256.67	$13.62	$15.79	$286.08
	168.17	$5,390.15	$296.15	$343.36	$6,029.66
Labor Contingency	50.45		Contractor Cost (0.15)		$904.45
			Contingency (0.30)		$2,080.24
Task 51032 Total	218.62				$9,014.35
Subject 51030 Total	821.47				$33,436.63
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	29.12	$806.33	$18.32	$29.42	$854.07
Ind. Labor & Material	9.61	$266.09	$0.00	$0.88	$266.97
State Sales Tax	0.00	$0.00	$0.68	$1.14	$1.82
QA/QC Impact	1.94	$53.62	$0.92	$1.52	$56.06

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	40.67	$1,126.04	$19.92	$32.96	$1,178.92
Labor Contingency	10.17		Contractor Cost (0.15)		$176.84
			Contingency (0.25)		$338.95
Task 51040 Total	50.83				$1,694.71
Subject 51040 Total	50.83				$1,694.71
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	101.96	$2,823.30	$1,026.22	$678.79	$4,528.31
Ind. Labor & Material	33.65	$931.69	$0.00	$20.36	$952.05
State Sales Tax	0.00	$0.00	$38.48	$26.22	$64.70
QA/QC Impact	6.78	$187.75	$51.32	$34.96	$274.03
	142.39	$3,942.74	$1,116.02	$760.33	$5,819.09
Labor Contingency	42.72		Contractor Cost (0.15)		$872.87
			Contingency (0.30)		$2,007.59
Task 51050 Total	185.10				$8,699.55
Subject 51050 Total	185.10				$8,699.55
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	30.37	$841.19	$2,717.17	$1,184.35	$4,742.71
Ind. Labor & Material	10.02	$277.59	$0.00	$35.53	$313.12
State Sales Tax	0.00	$0.00	$101.90	$45.75	$147.65
QA/QC Impact	2.02	$55.94	$135.86	$60.99	$252.79
	42.41	$1,174.72	$2,954.93	$1,326.62	$5,456.27
Labor Contingency	10.60		Contractor Cost (0.15)		$818.45
			Contingency (0.25)		$1,568.68
Task 51070 Total	53.01				$7,843.40
Subject 51070 Total	53.01				$7,843.40
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.83	$27.24	$341.85	$4.73	$373.82
Ind. Labor & Material	0.27	$8.69	$0.00	$0.14	$8.83
State Sales Tax	0.00	$0.00	$12.82	$0.18	$13.00
QA/QC Impact	0.06	$1.81	$17.10	$0.24	$19.15
	1.16	$38.04	$371.77	$5.29	$415.10
Labor Contingency	0.29		Contractor Cost (0.15)		$62.26
			Contingency (0.25)		$119.34
Task 51080 Total	1.45				$596.70
Subject 51080 Total	1.45				$596.70
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	2.96	$100.88	$800.05	$182.48	$1,083.41
Ind. Labor & Material	0.98	$33.29	$0.00	$5.47	$38.76
State Sales Tax	0.00	$0.00	$30.00	$7.05	$37.05
QA/QC Impact	0.20	$6.71	$40.00	$9.40	$56.11
	4.13	$140.88	$870.05	$204.40	$1,215.33
Labor Contingency	1.03		Contractor Cost (0.15)		$182.30
			Contingency (0.25)		$349.40
Task 51090 Total	5.17				$1,747.03
Subject 51090 Total	5.17				$1,747.03
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	212.40	$7,029.05	$1,189.77	$1,723.32	$9,942.14
Ind. Labor & Material	70.09	$2,319.59	$0.00	$51.70	$2,371.28
State Sales Tax	0.00	$0.00	$44.62	$66.56	$111.18
QA/QC Impact	14.12	$467.43	$59.49	$88.75	$615.67
	296.62	$9,816.07	$1,293.88	$1,930.33	$13,040.28
Labor Contingency	88.99		Contractor Cost (0.15)		$1,956.04
			Contingency (0.30)		$4,498.90
Task 51100 Total	385.61				$19,495.22
Subject 51100 Total	385.61				$19,495.22
51110 Control Room Facility					
51110 Control Room Facility					
Direct Cost	365.30	$10,123.60	$5.27	$752.87	$10,881.74
Ind. Labor & Material	120.55	$3,340.79	$0.00	$22.59	$3,363.38
State Sales Tax	0.00	$0.00	$0.20	$29.08	$29.28
QA/QC Impact	24.29	$673.22	$0.26	$38.77	$712.25
	510.15	$14,137.61	$5.73	$843.31	$14,986.65
Labor Contingency	127.54		Contractor Cost (0.15)		$2,248.00
			Contingency (0.25)		$4,308.66
Task 51110 Total	637.68				$21,543.31
Subject 51110 Total	637.68				$21,543.31
Category 51000 Total	2688.47				$114,249.13
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	52.00	$1,771.64	$3,041.76	$581.01	$5,394.41
Ind. Labor & Material	17.16	$584.64	$0.00	$17.43	$602.07
State Sales Tax	0.00	$0.00	$114.06	$22.44	$136.50
QA/QC Impact	3.46	$117.81	$152.09	$29.92	$299.82
	72.62	$2,474.09	$3,307.91	$650.80	$6,432.80
Labor Contingency	18.15		Contractor Cost (0.15)		$664.72
			Contingency (0.25)		$1,849.43
Task 52010 Total	90.77				$9,247.15
Subject 52010 Total	90.77				$9,247.15
52020 Communications					
52020 Communications					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	29.77	$1,014.34	$14.39	$92.28	$1,121.01
Ind. Labor & Material	9.85	$334.73	$0.00	$2.77	$337.50
State Sales Tax	0.00	$0.00	$0.54	$3.56	$4.10
QA/QC Impact	1.98	$67.45	$0.72	$4.75	$72.92
	41.58	$1,416.52	$15.65	$103.36	$1,535.53
Labor Contingency	12.47		Contractor Cost (0.15)		$230.34
			Contingency (0.30)		$529.77
Task 52020 Total	54.05				$2,295.64
Subject 52020 Total	54.05				$2,295.64
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	52.00	$1,439.88	$4,845.25	$1,026.47	$7,311.60
Ind. Labor & Material	17.16	$475.16	$0.00	$30.79	$505.95
State Sales Tax	0.00	$0.00	$181.70	$39.65	$221.35
QA/QC Impact	3.46	$95.75	$242.26	$52.86	$390.87
	72.62	$2,010.79	$5,269.21	$1,149.77	$8,429.77
Labor Contingency	21.79		Contractor Cost (0.15)		$1,264.46
			Contingency (0.30)		$2,908.27
Task 52040 Total	94.40				$12,602.50
Subject 52040 Total	94.40				$12,602.50
Category 52000 Total	239.23				$24,145.29
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	463.29	$15,204.22	$5,724.45	$8,055.66	$28,984.33
Ind. Labor & Material	152.88	$5,017.35	$0.00	$221.67	$5,239.02
State Sales Tax	0.00	$0.00	$214.67	$311.15	$525.82
QA/QC Impact	30.81	$1,011.08	$286.22	$414.87	$1,712.17
	646.98	$21,232.69	$6,225.34	$9,023.35	$36,481.38
Labor Contingency	226.44		Contractor Cost (0.15)		$5,472.21
			Contingency (0.35)		$14,683.75
Task 53000 Total	873.42				$56,637.34
Subject 53000 Total	873.42				$56,637.34
Category 53000 Total	873.42				$56,637.34
Area 50000 Total	3801.12				$195,031.76

* TOTAL LABOR HOURS AND COST FOR PHASE 3 OF PROJECT. 5105.15 x 10^3 man-hrs $270,302.38 *

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
********* PROJECT PHASE 4 **********					
20000 SURFACE FACILITIES:					
23000 SURFACE SHAFT FACILITIES					
23010 Men and Materials Facility					
23011 Headframe					
Direct Cost	99.36	$3,252.96	$250.13	$1,460.61	$4,963.70
Ind. Labor & Material	32.79	$1,073.48	$0.00	$43.82	$1,117.30
State Sales Tax	0.00	$0.00	$9.38	$56.42	$65.80
QA/QC Impact	6.61	$216.32	$12.51	$75.22	$304.05
	138.76	$4,542.76	$272.02	$1,636.07	$6,450.85
Labor Contingency	41.63		Contractor Cost (0.15)		$967.64
			Contingency (0.30)		$2,225.55
Task 23011 Total	180.38				$9,644.04
Subject 23010 Total	180.38				$9,644.04
23080 Confinement Exhaust Facility - 1					
23085 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.51		Contractor Cost (0.15)		$13.58
			Contingency (0.30)		$31.23
Task 23085 Total	2.19				$135.31
Subject 23080 Total	2.19				$135.31
23100 Exploratory Shaft Facility - 1					
23105 Other (Inspection hoist)					
Direct Cost	1.21	$39.46	$6.34	$25.45	$71.25
Ind. Labor & Material	0.40	$13.02	$0.00	$0.76	$13.78
State Sales Tax	0.00	$0.00	$0.24	$0.98	$1.22
QA/QC Impact	0.08	$2.62	$0.32	$1.31	$4.25
	1.68	$55.10	$6.90	$28.50	$90.50
Labor Contingency	0.42		Contractor Cost (0.15)		$13.58
			Contingency (0.25)		$26.02
Task 23105 Total	2.11				$130.10
Subject 23100 Total	2.11				$130.10
23110 Exploratory Shaft Facility - 2					
23115 Other (Inspection / escape hoist)					
Direct Cost	1.07	$35.08	$5.63	$22.62	$63.33
Ind. Labor & Material	0.35	$11.58	$0.00	$0.68	$12.27
State Sales Tax	0.00	$0.00	$0.21	$0.87	$1.08
QA/QC Impact	0.07	$2.33	$0.28	$1.17	$3.78
	1.50	$48.99	$6.12	$25.34	$80.45
Labor Contingency	0.37		Contractor Cost (0.15)		$12.07
			Contingency (0.25)		$23.13
Task 23115 Total	1.87				$115.65
Subject 23110 Total	1.87				$115.65
Category 23000 Total	186.55				$10,025.10
Area 20000 Total	186.55				$10,025.10
30000 SHAFTS/RAMPS - UNDERGROUND					
30000 SHAFTS/RAMPS - UNDERGROUND					
30010 Men and Materials Shaft					
30010 Men and Materials Shaft					
Direct Cost	15.18	$420.35	$86.18	$344.71	$851.24
Ind. Labor & Material	5.01	$138.72	$0.00	$10.34	$149.06
State Sales Tax	0.00	$0.00	$3.23	$13.31	$16.54
QA/QC Impact	1.01	$27.95	$4.31	$17.75	$50.01
	21.20	$587.02	$93.72	$386.11	$1,066.85
Labor Contingency	6.36		Contractor Cost (0.15)		$160.03
			Contingency (0.30)		$368.07
Task 30010 Total	27.56				$1,594.95
Subject 30010 Total	27.56				$1,594.95
30080 Emplacement Exhaust Shaft					
30080 Emplacement Exhaust Shaft					
Direct Cost	8.22	$227.53	$46.66	$186.65	$460.84
Ind. Labor & Material	2.71	$75.08	$0.00	$5.60	$80.68
State Sales Tax	0.00	$0.00	$1.75	$7.21	$8.96
QA/QC Impact	0.55	$15.13	$2.33	$9.61	$27.07
	11.48	$317.74	$50.74	$209.07	$577.55
Labor Contingency	3.44		Contractor Cost (0.15)		$86.63
			Contingency (0.30)		$199.25
Task 30080 Total	14.92				$863.43
Subject 30080 Total	14.92				$863.43
30100 Exploratory Shaft - 1					
30106 Other (Shaft conversion to vent intake duty)					
Direct Cost	4.10	$113.84	$23.29	$93.18	$230.11
Ind. Labor & Material	1.35	$37.50	$0.00	$2.80	$40.30
State Sales Tax	0.00	$0.00	$0.87	$3.60	$4.47
QA/QC Impact	0.27	$7.56	$1.16	$4.80	$13.52
	5.73	$158.70	$25.32	$104.38	$288.40
Labor Contingency	1.43		Contractor Cost (0.15)		$43.27
			Contingency (0.25)		$82.93
Task 30106 Total	7.16				$414.60
Subject 30100 Total	7.16				$414.60

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
30110 Exploratory Shaft - 2					
30116 Other (Shaft operation and maintenance)					
Direct Cost	3.65	$101.01	$20.71	$82.83	$204.55
Ind. Labor & Material	1.20	$33.33	$0.00	$2.48	$35.81
State Sales Tax	0.00	$0.00	$0.78	$2.20	$3.98
QA/QC Impact	0.24	$6.72	$1.04	$4.27	$12.03
	5.09	$141.06	$22.53	$92.78	$256.37
Labor Contingency	1.27		Contractor Cost (0.15)		$38.45
			Contingency (0.25)		$73.72
Task 30116 Total	6.37				$368.54
Subject 30110 Total	6.37				$368.54
Category 30000 Total	56.01				$3,241.52
Area 30000 Total	56.01				$3,241.52
40000 SUBSURFACE EXCAVATIONS					
41000 DEVELOPMENT					
41070 General Maintenance					
41070 General Maintenance					
Direct Cost	162.00	$4,485.60	$2,282.85	$637.20	$7,405.65
Ind. Labor & Material	53.46	$1,480.25	$0.00	$19.12	$1,499.37
State Sales Tax	0.00	$0.00	$85.61	$24.61	$110.22
QA/QC Impact	10.77	$298.29	$114.14	$32.82	$445.25
	226.23	$6,264.14	$2,482.60	$713.75	$9,460.49
Labor Contingency	56.56		Contractor Cost (0.15)		$1,419.08
			Contingency (0.25)		$2,719.90
Task 41070 Total	282.79				$13,599.47
Subject 41070 Total	282.79				$13,599.47
Category 41000 Total	282.79				$13,599.47
43000 BACKFILL					
43010 Men and Materials Shaft					
43010 Men and Materials Shaft					
Direct Cost	59.17	$1,638.80	$394.24	$336.07	$2,369.11
Ind. Labor & Material	19.53	$540.80	$0.00	$10.08	$550.88
State Sales Tax	0.00	$0.00	$14.79	$12.98	$27.77
QA/QC Impact	3.93	$108.98	$19.71	$17.31	$146.00
	82.63	$2,288.58	$428.74	$376.44	$3,093.76
Labor Contingency	33.05		Contractor Cost (0.15)		$464.07
			Contingency (0.40)		$1,423.13
Task 43010 Total	115.69				$4,980.96
Subject 43010 Total	115.69				$4,980.96
43020 Waste Handling Ramp					
43020 Waste Handling Ramp					
Direct Cost	23.60	$654.69	$659.97	$227.58	$1,542.24
Ind. Labor & Material	7.79	$216.05	$0.00	$6.83	$222.88
State Sales Tax	0.00	$0.00	$24.75	$8.79	$33.54
QA/QC Impact	1.57	$43.54	$33.00	$11.72	$88.26
	32.96	$914.28	$717.72	$254.92	$1,886.92
Labor Contingency	13.18		Contractor Cost (0.15)		$283.04
			Contingency (0.40)		$867.98
Task 43020 Total	46.15				$3,037.94
Subject 43020 Total	46.15				$3,037.94
43030 Tuff Ramp					
43030 Tuff Ramp					
Direct Cost	13.07	$362.86	$235.91	$256.98	$855.75
Ind. Labor & Material	4.31	$119.74	$0.00	$7.71	$127.45
State Sales Tax	0.00	$0.00	$8.85	$9.93	$18.78
QA/QC Impact	0.87	$24.13	$11.80	$13.23	$49.16
	18.25	$506.73	$256.56	$287.85	$1,051.14
Labor Contingency	7.30		Contractor Cost (0.15)		$157.67
			Contingency (0.40)		$483.52
Task 43030 Total	25.55				$1,692.33
Subject 43030 Total	25.55				$1,692.33
43080 Emplacement Exhaust Shaft					
43080 Emplacement Exhaust Shaft					
Direct Cost	4.15	$115.15	$24.09	$158.77	$298.01
Ind. Labor & Material	1.37	$38.00	$0.00	$4.76	$42.76
State Sales Tax	0.00	$0.00	$0.91	$6.13	$7.04
QA/QC Impact	0.28	$7.66	$1.20	$8.18	$17.04
	5.79	$160.81	$26.20	$177.84	$364.85
Labor Contingency	2.32		Contractor Cost (0.15)		$54.73
			Contingency (0.40)		$167.83
Task 43080 Total	8.11				$587.41
Subject 43080 Total	8.11				$587.41
43100 Exploratory Shaft - 1					
43100 Exploratory Shaft - 1					
Direct Cost	2.76	$76.57	$10.35	$203.90	$290.82
Ind. Labor & Material	0.91	$25.27	$0.00	$6.12	$31.39
State Sales Tax	0.00	$0.00	$0.38	$7.88	$8.26
QA/QC Impact	0.18	$5.09	$0.51	$10.50	$16.10
	3.86	$106.93	$11.24	$228.40	$346.57
Labor Contingency	1.54		Contractor Cost (0.15)		$51.99
			Contingency (0.40)		$159.43
Task 43100 Total	5.40				$557.99
Subject 43100 Total	5.40				$557.99
43110 Exploratory Shaft - 2					
43110 Exploratory Shaft - 2					

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
Direct Cost	0.60	$16.61	$2.11	$43.89	$62.61
Ind. Labor & Material	0.20	$5.48	$0.00	$1.32	$6.80
State Sales Tax	0.00	$0.00	$0.08	$1.70	$1.78
QA/QC Impact	0.04	$1.10	$0.10	$2.26	$3.46
	0.84	$23.19	$2.29	$49.17	$74.65
Labor Contingency	0.33		Contractor Cost (0.15)		$11.20
			Contingency (0.40)		$34.34
Task 43110 Total	1.17				$120.19
Subject 43110 Total	1.17				$120.19
43300 Development Areas					
43300 Development Areas					
Direct Cost	610.18	$17,067.67	$15,606.11	$9,658.09	$42,331.87
Ind. Labor & Material	201.36	$5,632.33	$0.00	$282.74	$5,915.07
State Sales Tax	0.00	$0.00	$585.22	$373.04	$958.26
QA/QC Impact	40.58	$1,135.00	$780.31	$497.39	$2,412.70
	852.11	$23,835.00	$16,971.64	$10,818.26	$51,624.90
Labor Contingency	340.84		Contractor Cost (0.15)		$7,743.74
			Contingency (0.40)		$23,747.45
Task 43300 Total	1192.96				$83,116.09
Subject 43300 Total	1192.96				$83,116.09
Category 43000 Total	1395.03				$94,092.91
Area 40000 Total	1677.82				$107,692.38
50000 UNDERGROUND SERVICE SYSTEMS					
51000 SUPPORT SYSTEM FACILITIES					
51010 Material Support, Receiving/warehousing					
51011 Facilities					
Direct Cost	180.35	$4,994.18	$724.73	$370.64	$6,089.55
Ind. Labor & Material	59.51	$1,648.08	$0.00	$11.12	$1,659.20
State Sales Tax	0.00	$0.00	$27.18	$14.32	$41.50
QA/QC Impact	11.99	$332.11	$36.24	$19.09	$387.44
	251.86	$6,974.37	$788.15	$415.17	$8,177.69
Labor Contingency	62.96		Contractor Cost (0.15)		$1,226.66
			Contingency (0.25)		$2,521.09
Task 51011 Total	314.82				$11,755.44
Subject 51010 Total	314.82				$11,755.44
51030 Maintenance Facility					
51031 Development Area					
Direct Cost	291.47	$9,343.50	$793.81	$644.80	$10,782.11
Ind. Labor & Material	96.19	$3,083.36	$0.00	$19.34	$3,102.70
State Sales Tax	0.00	$0.00	$29.77	$24.91	$54.68
QA/QC Impact	19.38	$621.34	$39.69	$33.21	$694.24
	407.04	$13,048.20	$863.27	$722.26	$14,633.73
Labor Contingency	122.11		Contractor Cost (0.15)		$2,195.07
			Contingency (0.30)		$5,048.63
Task 51031 Total	529.16				$21,877.43
Subject 51030 Total	529.16				$21,877.43
51040 Emergency Medical/Rescue Chamber					
51040 Emergency Medical/Rescue Chamber					
Direct Cost	82.43	$2,559.53	$153.95	$340.84	$3,054.32
Ind. Labor & Material	30.50	$844.64	$0.00	$10.23	$854.87
State Sales Tax	0.00	$0.00	$5.78	$13.17	$18.95
QA/QC Impact	6.15	$170.21	$7.70	$17.55	$195.46
	129.09	$3,574.38	$167.43	$381.79	$4,123.60
Labor Contingency	32.27		Contractor Cost (0.15)		$618.54
			Contingency (0.25)		$1,185.54
Task 51040 Total	161.36				$5,927.68
Subject 51040 Total	161.36				$5,927.68
51050 Ventilation System (Waste Emplacement)					
51050 Ventilation System (Waste Emplacement)					
Direct Cost	149.96	$4,152.46	$4,239.96	$3,155.52	$11,547.94
Ind. Labor & Material	49.49	$1,370.31	$0.00	$24.67	$1,394.98
State Sales Tax	0.00	$0.00	$158.99	$121.88	$280.87
QA/QC Impact	9.97	$276.14	$212.00	$162.51	$650.65
	209.42	$5,798.91	$4,610.95	$3,534.58	$13,944.44
Labor Contingency	62.83		Contractor Cost (0.15)		$2,091.67
			Contingency (0.30)		$4,810.84
Task 51050 Total	272.25				$20,846.95
Subject 51050 Total	272.25				$20,846.95
51070 Mine Water Control System					
51070 Mine Water Control System					
Direct Cost	10.51	$291.18	$940.56	$409.97	$1,641.71
Ind. Labor & Material	3.47	$96.09	$0.00	$12.30	$108.39
State Sales Tax	0.00	$0.00	$35.28	$15.84	$51.12
QA/QC Impact	0.70	$19.36	$47.02	$21.11	$87.49
	14.68	$406.63	$1,022.86	$459.22	$1,888.71
Labor Contingency	3.67		Contractor Cost (0.15)		$283.31
			Contingency (0.25)		$543.00
Task 51070 Total	18.35				$2,715.02
Subject 51070 Total	18.35				$2,715.02
51080 Fire Protection/Control					
51080 Fire Protection/Control					
Direct Cost	0.58	$18.86	$185.29	$3.28	$207.43
Ind. Labor & Material	0.19	$6.22	$0.00	$0.10	$6.32
State Sales Tax	0.00	$0.00	$6.95	$0.13	$7.08
QA/QC Impact	0.04	$1.25	$9.27	$0.17	$10.69

COST ACCOUNT	LABOR HOURS (hrs x 10^-3)	LABOR	EQUIPMENT	MATERIALS	TOTAL
		(All costs in thousands of dollars)			
	0.80	$26.33	$201.51	$3.68	$231.52
Labor Contingency	0.20			Contractor Cost (0.15)	$34.72
				Contingency (0.25)	$66.56
Task 51080 Total	1.01				$332.80
Subject 51080 Total	1.01				$332.80
51090 Operations Support Facility					
51090 Operations Support Facility					
Direct Cost	0.51	$17.46	$820.67	$101.95	$940.08
Ind. Labor & Material	0.17	$5.76	$0.00	$3.06	$8.82
State Sales Tax	0.00	$0.00	$30.78	$3.94	$34.72
QA/QC Impact	0.03	$1.16	$41.03	$5.25	$47.44
	0.72	$24.38	$892.48	$114.20	$1,031.06
Labor Contingency	0.18			Contractor Cost (0.15)	$154.66
				Contingency (0.25)	$296.43
Task 51090 Total	0.89				$1,482.15
Subject 51090 Total	0.89				$1,482.15
51100 Contamination Control System					
51100 Contamination Control System					
Direct Cost	117.76	$3,868.51	$705.29	$719.47	$5,293.27
Ind. Labor & Material	38.86	$1,276.21	$0.00	$21.58	$1,298.19
State Sales Tax	0.00	$0.00	$26.45	$27.79	$54.24
QA/QC Impact	7.83	$257.26	$35.26	$37.05	$329.57
	164.45	$5,402.38	$767.00	$805.89	$6,975.27
Labor Contingency	49.34			Contractor Cost (0.15)	$1,046.30
				Contingency (0.30)	$2,406.47
Task 51100 Total	213.79				$10,428.04
Subject 51100 Total	213.79				$10,428.04
Category 51000 Total	1511.62				$75,365.51
52000 UTILITIES					
52010 Electrical					
52010 Electrical					
Direct Cost	37.20	$1,267.40	$5,120.52	$265.88	$6,653.80
Ind. Labor & Material	12.28	$418.24	$0.00	$8.08	$426.32
State Sales Tax	0.00	$0.00	$192.02	$10.27	$202.29
QA/QC Impact	2.47	$84.28	$256.03	$13.69	$354.00
	51.95	$1,769.92	$5,568.57	$297.82	$7,636.31
Labor Contingency	12.99			Contractor Cost (0.15)	$1,145.44
				Contingency (0.25)	$2,195.45
Task 52010 Total	64.94				$10,977.20
Subject 52010 Total	64.94				$10,977.20
52020 Communications					
52020 Communications					
Direct Cost	5.33	$181.71	$2.58	$16.53	$200.82
Ind. Labor & Material	1.76	$59.96	$0.00	$0.50	$60.46
State Sales Tax	0.00	$0.00	$0.10	$0.64	$0.74
QA/QC Impact	0.35	$12.08	$0.13	$0.85	$13.06
	7.45	$253.75	$2.81	$18.52	$275.08
Labor Contingency	2.23			Contractor Cost (0.15)	$41.26
				Contingency (0.30)	$84.91
Task 52020 Total	9.68				$411.25
Subject 52020 Total	9.68				$411.25
52040 Chilled Water					
52040 Chilled Water					
Direct Cost	135.22	$3,744.02	$14,637.55	$6,959.17	$25,340.74
Ind. Labor & Material	44.65	$1,235.53	$0.00	$208.78	$1,444.31
State Sales Tax	0.00	$0.00	$548.91	$268.80	$817.71
QA/QC Impact	8.99	$248.98	$731.87	$358.40	$1,339.25
	188.83	$5,228.53	$15,918.33	$7,795.15	$28,942.01
Labor Contingency	56.65			Contractor Cost (0.15)	$4,341.31
				Contingency (0.30)	$9,985.00
Task 52040 Total	245.48				$43,268.32
Subject 52040 Total	245.48				$43,268.32
Category 52000 Total	320.10				$54,656.77
53000 MONITORING					
53000 MONITORING					
53000 MONITORING					
Direct Cost	129.04	$4,186.11	$1,233.76	$2,788.50	$8,208.37
Ind. Labor & Material	42.58	$1,381.42	$0.00	$83.66	$1,465.08
State Sales Tax	0.00	$0.00	$46.28	$107.71	$153.97
QA/QC Impact	8.58	$278.38	$61.69	$143.61	$483.68
	180.21	$5,845.91	$1,341.71	$3,123.48	$10,311.10
Labor Contingency	63.07			Contractor Cost (0.15)	$1,546.67
				Contingency (0.35)	$4,150.21
Task 53000 Total	243.28				$16,007.98
Subject 53000 Total	243.28				$16,007.98
Category 53000 Total	243.28				$16,007.98
Area 50000 Total	2075.00				$146,030.26

* TOTAL LABOR HOURS AND COST FOR PHASE 4 OF PROJECT. 3995.38 x 10^3 man-hrs $266,989.26 *

Appendix C
MRS SENSITIVITY STUDIES

MRS SENSITIVITY STUDIES FOR THE REPOSITORY

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1.0 INTRODUCTION

The MRS System Study for the Repository evaluated nine cases which contain variations on packaging, transportation, and repository and MRS functions. In Cases 1 and 2 of that study, it is assumed that there is no MRS. In Case 1, the spent fuel assemblies are shipped intact and then consolidated and containerized at the repository. In Case 2, the spent fuel assemblies are shipped intact to the repository, where they are containerized without consolidation. In Cases 6 through 9 of that report, spent nuclear fuel and DHLW are containerized at the MRS, and the repository does not perform a containerizing function.

In addition to the scenarios evaluated in the MRS System Study for the Repository, this report evaluates four additional variations associated with MRS Cases 1, 2, 6, 7, 8, and 9. A brief description and a summary of the results are provided for each sensitivity study in Sections 2 through 5 of this report. The MRS Sensitivity Studies 1, 2, 3, and 4 Reports are included in Appendix 1.

2.0 MRS SENSITIVITY STUDY NO. 1

2.1 Description

This sensitivity study evaluates two additional phased repository configurations: (1) two waste-handling buildings, as in Case 1 of the MRS System Study for the Repository, plus an outdoor cask storage facility for transportable storage casks, and (2) one waste-handling building, as in Case 2 of the MRS System Study for the Repository, plus an outdoor cask storage facility for transportable storage casks. In both instances, the cask storage facility has the capacity to accommodate transportable storage casks containing a total of 750 MTU of spent nuclear fuel. It should be noted that the amended Nuclear Waste Policy Act (NWPA)

may not allow for this additional storage. Implementation of this additional storage may require changes in the NWPA and in 10CFR60.

The scope of this sensitivity study includes (1) a description of the cask storage facility, the transportable storage casks, and the cask-handling equipment, (2) the development of general arrangement drawings and construction and operating cost estimates for the cask storage facility, and (3) a construction schedule, coordinating construction of the cask storage facility with other repository facilities in order to determine if the required waste receipt schedule is feasible.

2.2 Results

Transportable storage casks may be used to store the spent fuel assemblies for the first phase of repository operation while the waste-handling building is being completed. The construction schedule developed in this sensitivity study indicates that, with the construction and use of a transportable storage cask facility, the required waste receipt schedule for the years 2001 through 2003 is feasible.

The estimated costs of the cask storage facility are summarized as follows:

Cost Account	Cost ($1988)
Construction	$13 million
Operating	$3 million
Decommissioning	$1 million
Total	$17 million

3.0 MRS SENSITIVITY STUDY NO. 2

3.1 Description

This sensitivity study evaluates for Cases 6, 7, 8, and 9 of the MRS System Study for the Repository, the impact on the repository construction and operating cost of adding containerizing capabilities at the repository for 200 and 400 MTU/yr of DHLW.

3.2 Results

To containerize 400 MTU/yr of DHLW, the cost of additional staffing is $6 million and the container cost is $216 million for the 17 yr during which the DHLW is received and containerized. The additional capital cost is $4 million. Thus, the total additional repository operating and capital cost for this capability is $226 million.

To containerize 200 MTU/yr of DHLW, the cost of additional staffing is $6 million and the container cost is $108 million for the 17 yr during which the DHLW is received and containerized. The additional capital cost is $4 million. The total additional operating and capital cost of the repository for this capability is $118 million.

4.0 MRS SENSITIVITY STUDY NO. 3

4.1 Description

This sensitivity study evaluates, for Cases 1 and 2 of the MRS System Study for the Repository, the impact on the repository operating cost of receiving a portion of the spent fuel at the repository as overspill fuel from the reactors in the form of consolidated fuel in square open canisters.

4.2 Results

For Cases 1 and 2, the receipt of canistered overspill fuel at the repository has no impact on the design and construction cost of the repository and no significant impact on the repository operating cost, except for the cost due to the change in the number of containers.

For Case 1, the receipt of canistered overspill fuel at the repository results in 108 additional spent fuel containers and 67 fewer hardware containers than there would be if canistered overspill fuel were not received at the repository. The impact of the revised number of containers on the operating cost of the repository is a $1-million increase.

For Case 2, the receipt of canistered overspill fuel at the repository results in 1,172 fewer spent fuel containers than there would be if canistered overspill fuel were not received at the repository. The impact of the reduced number of containers on the operating cost of the repository is a $36-million cost reduction.

5.0 MRS SENSITIVITY STUDY NO. 4

5.1 Description

This sensitivity study estimates, for Cases 1 and 2 of the MRS System Study for the Repository, the differential construction and operating costs associated with the receipt of reactor overspill fuel in the form of intact fuel shipped in NUTECH horizontal modular storage (NUHOMS) canisters.

5.2 Results

Adding the capability of receiving and handling NUHOMS canisters at the repository will result in the following additional costs for both Cases 1 and 2:

Cost Account	Estimated Cost ($1988)
Construction	11 million
Operating	23 million
Decommissioning	1 million
Total	35 million

No additional spent fuel emplacement containers are needed as a result of receiving and handling NUHOMS canisters.

Appendix 1

MRS SENSITIVITY STUDIES 1, 2, 3, AND 4 REPORTS

MRS SENSITIVITY STUDY NO. 1:

TRANSPORTABLE STORAGE CASKS

MRS SENSITIVITY STUDY NO. 1

TRANSPORTABLE STORAGE CASKS

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1.0 INTRODUCTION

The MRS System Study for the Repository evaluated nine cases that involve variations on packaging, transportation, and repository and MRS functions. Case 1 in that study includes a phased repository, which contains two waste-handling buildings to receive spent nuclear fuel (SNF) and defense high-level waste (DHLW). For Case 1 the first waste-handling building, which is a less complex design than the second waste-handling building, is designed to facilitate a relatively short construction schedule to permit early receipt of SNF. For Case 2 in the MRS System Study for the Repository, the repository has only one waste-handling building.

The purpose of this sensitivity study is to evaluate two additional phased repository configurations: (1) two waste-handling buildings, as in Case 1 of the MRS System Study for the Repository, plus an outdoor cask storage facility for transportable storage casks, and (2) one waste-handling building, as in Case 2 of the MRS System Study for the Repository, plus an outdoor cask storage facility for transportable storage casks. In both instances, the cask storage facility has the capacity to accommodate transportable storage casks containing a total of 750 metric tons of uranium (MTU) of SNF. It should be noted that the amended Nuclear Waste Policy Act (NWPA) may not allow for this additional storage. Implementation of this additional storage may require changes in the NWPA and in 10CFR60.

The scope of this sensitivity study includes (1) a description of the cask storage facility, the transportable storage casks, and the cask-handling equipment, (2) the development of general arrangement drawings and construction and operating cost estimates for the cask storage facility, and (3) a construction schedule, coordinating construction of the cask storage facility with other repository facilities in order to determine if the following waste receipt schedule is reasonable:

2001	300 MTU SNF	All transportable casks
2002	300 MTU SNF	All transportable casks
2003	400 MTU SNF	150 MTU transportable casks 250 MTU waste-handling building
2004	900 MTU SNF	All waste-handling building

2.0 SUMMARY

Transportable storage casks may be used to store the SNF assemblies for the first phase of repository operation while the waste-handling building is being completed. The construction schedule developed in this sensitivity study indicates that, with the construction and use of a transportable storage cask facility, the required waste receipt schedule for the years 2001 through 2003 is feasible.

The transportable storage cask storage yard is located in a restricted area of the repository near the waste-handling building, but not so close as to interfere with its construction.

Three concrete pads provide storage for 72 casks (24 casks per pad), which is equivalent to the 750 MTU storage requirement for the first phase of repository operation in the years 2001, 2002, and 2003.

Each cask is 8 ft in diameter and about 18 ft high, has a capacity of 24 PWR or 60 BWR assemblies, and weighs 125 tons when loaded. The casks provide (1) the means to maintain subcriticality, (2) gamma and neutron shielding, and (3) protection from outside hazards. The casks are cooled by natural convection.

A building is provided for operating personnel to inspect and perform minor repairs on the cask connections. A facility transfer vehicle and a cask transporter, in conjunction with a 150-ton capacity building crane, permit onsite cask handling and

transportation between the inspection and repair building and the storage pads.

The estimated costs of the cask storage facility are summarized as follows:

Cost Account	Cost ($1988)
Construction	13 million
Operation	3 million
Demolition	1 million
Total	17 million

3.0 DESIGN BASES AND ASSUMPTIONS

- Spent fuel receipt rates in dual-purpose casks:
  - Year 2001 300 MTU
  - Year 2002 300 MTU
  - Year 2003 150 MTU.
- Cask capacity: 24 PWR intact assemblies (10.3 MTU) or 60 BWR intact assemblies (10.8 MTU).
- Cask weight: 125 tons (loaded).
- Cask dimensions: 18 ft long and 8 ft in diameter.
- 66-2/3% PWR assemblies by weight.
- 33-1/3% BWR assemblies by weight.
- Each PWR assembly contains 0.43 MTU.
- Each BWR assembly contains 0.18 MTU.

- All fuel assemblies are intact.

- Rail shipment (horizontal position) only.

- Vertical storage of casks.

- The transportable storage casks are assumed to be supplied by and returned to others; therefore, their costs are not included in this sensitivity study.

4.0 DESCRIPTION

4.1 Storage Capacity

Based on a total storage capacity of 750 MTU, the total number of casks to be received and stored over a 3-yr period is 72, of which 49 contain PWR assemblies and 23 contain BWR assemblies. The annual receipt rate (rounded off to whole numbers) is 29 casks for the first 2 yr and 14 casks for the third year.

4.2 Transportable Storage Casks

The transportable storage casks, which are being developed for the dry storage of spent fuel assemblies, are similar to existing spent fuel transportation casks, except that they are being designed to accommodate a larger quantity of SNF assemblies. The heat generated by the stored spent fuel is dissipated from the exterior of the cask to the atmosphere by natural convection. Metal storage casks being considered for use by U.S. utilities are designed primarily for storage only, although they may be evaluated and licensed for future transportation use. Because of the size and weight of the storage casks, the casks are designed to be transported by railcar, barge, or special heavy-haul truck.

A typical transportable storage cask is shown in Figure 1. A typical cask design can hold 24 PWR or 60 BWR intact spent fuel

assemblies. The outer diameter of the cask is about 8 ft; the length is assumed to be 18 ft; and the weight is assumed to be 125 tons. Surface dose rates would be about 20 mrem/hr or less, depending on the design shielding thickness and materials of construction. The age of the spent fuel would be a minimum of 5 yr after reactor discharge. The casks are designed to be stored on concrete pads and should require no additional protection from the environment. The casks could be stored in either a vertical position or a horizontal position on a cradle. The vertical storage position has several advantages: less space is required, there is better heat transfer, and the use of a cradle is not required. The horizontal storage position has the following advantages: because it is received in a horizontal position, the cask need not be rotated; and the monitoring ports are easily accessed. The vertical storage position as used by Virginia Electric and Power Company at its Surry Power Station, is assumed in this sensitivity study.

Typically, the cask consists of an interior basket (which houses and supports the spent fuel assemblies), a containment vessel, a gamma radiation shield, and a neutron radiation shield. Figure 2 shows a Castor V/21 cask as manufactured by Gesellschaft fur Nuklear Service (GNS). Heat is removed from the fuel by conduction through the components in the cask and by natural convection from the cask surface. Each cask has a valve at the bottom which permits the cask to be drained after spent fuel has been loaded underwater. After the spent fuel has been loaded, the cask removed from the pool, and the water drained, air is forced through the cask via the vent and drain valves until all moisture inside the cask has evaporated. The cask is backfilled to a pressure slightly above atmospheric with an inert gas (such as helium), and the valves are then closed to seal the cask. The helium pressure in the space between the lids is monitored to determine if there is any leakage from the cask. The helium also serves as a heat transfer medium.

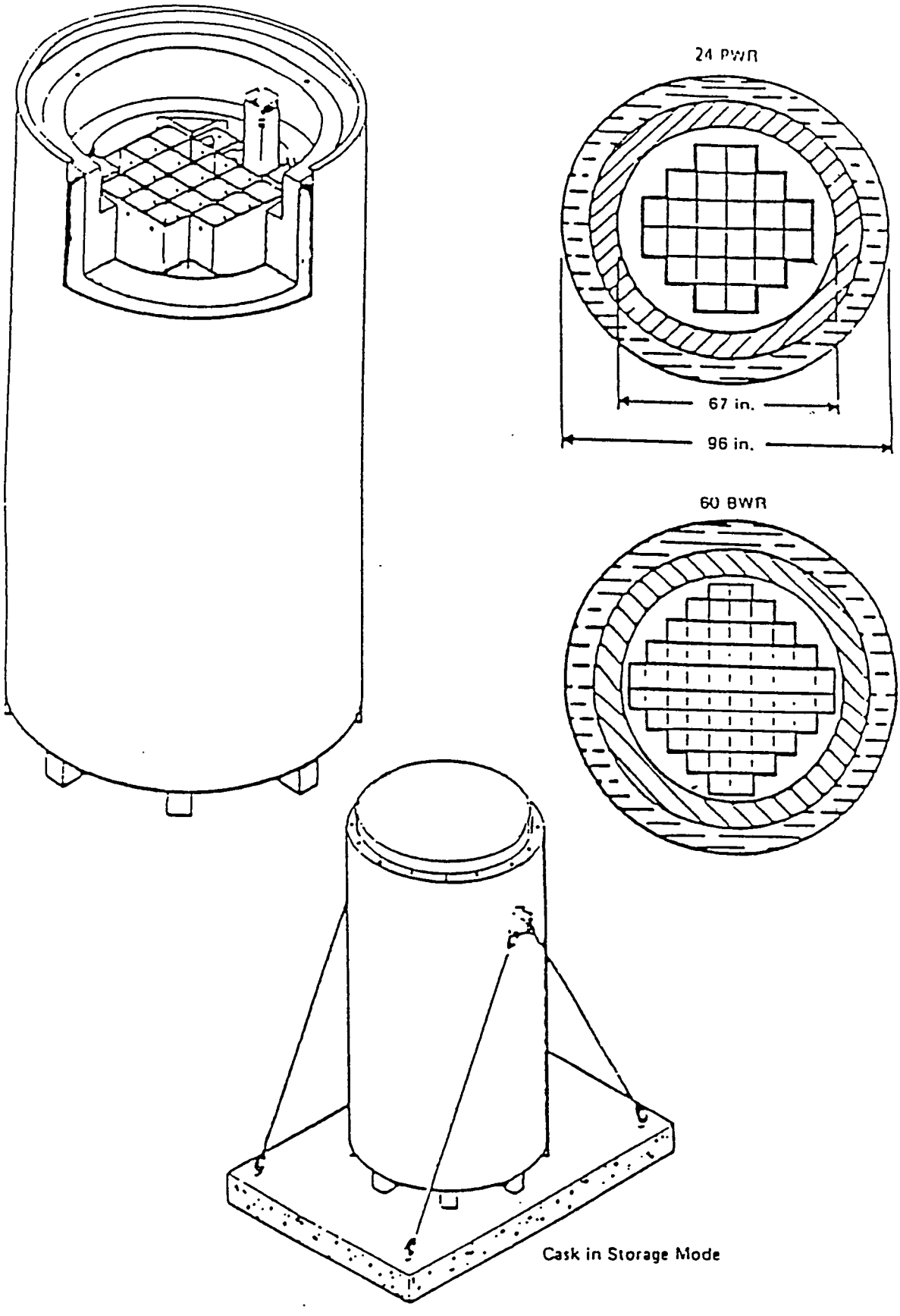


Figure 1. Typical Spent Fuel Transportable Storage Cask

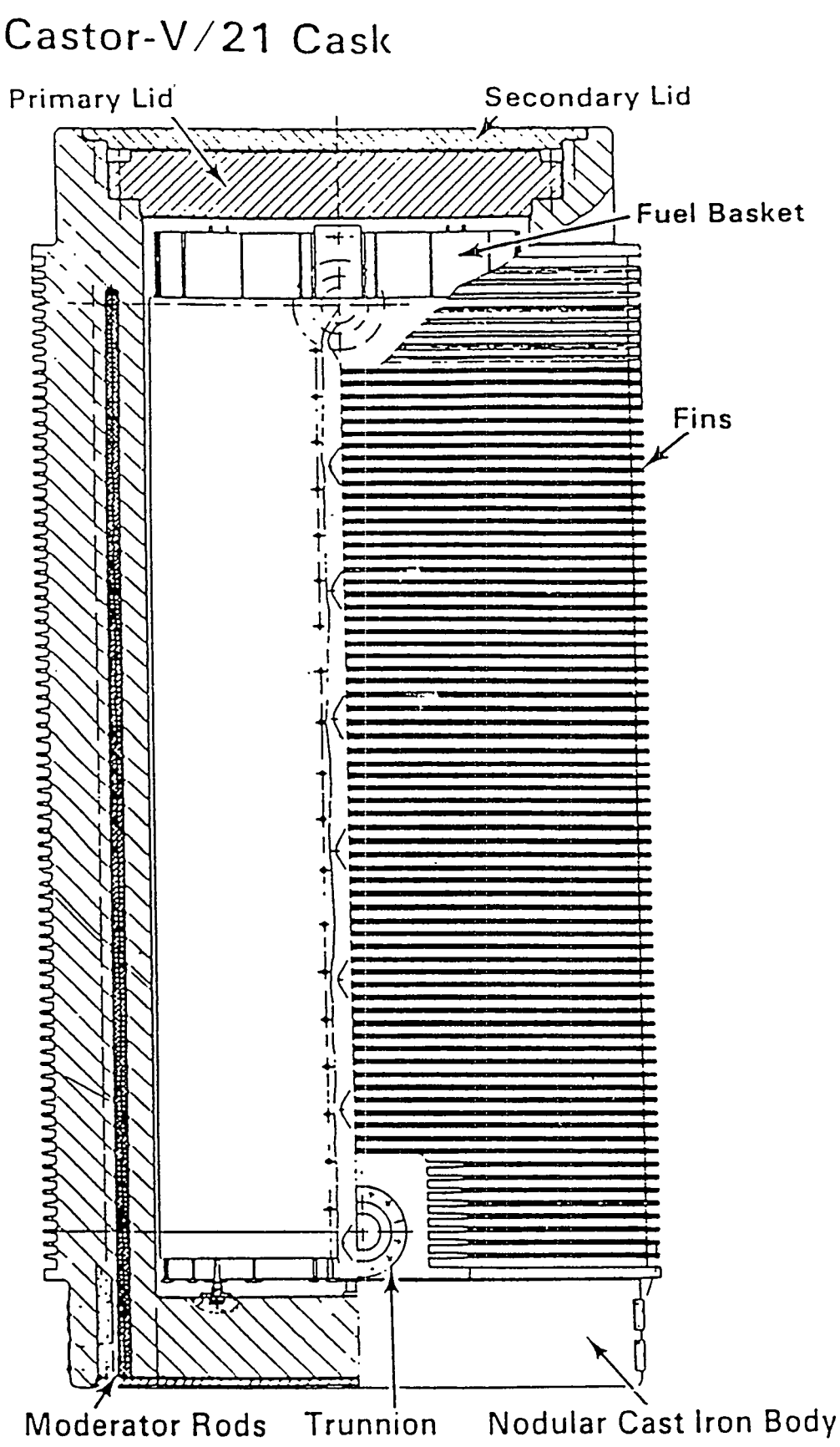


Figure 2. GNS Castor V/21 Cask

At the present time, there are several vendors in the process of developing storage casks for potential use in the U.S. Table 1 summarizes the key design features of the casks developed by three of these vendors.

The transportable storage cask concept offers several desirable features. For small increments of storage capacity, the casks cost less than a new wet storage pool or dry storage vault methods. The cask can be procured incrementally to match developing storage needs and can be sealed to provide a leaktight containment. Only periodic monitoring of internal temperatures and pressures and occasional sampling of the internal atmosphere are required.

The key features of the transportable storage casks are

- cask-tightness and barrier against activity release and loss of internal heat-transfer medium (helium),
- structural integrity and stability as a safety confinement against external impacts and cask-handling failures,
- criticality safety to ensure that the fuel inside the cask remains subcritical and that arrangements of an infinite number of casks can be stored in close proximity,
- sufficient gamma and neutron shielding such that no additional shielding is necessary for transportation and storage, and
- passive heat removal of the spent fuel decay heat by natural convection.

Other detailed features and characteristics are given in the topical reports for the specific casks.

TABLE 1

SPENT FUEL DRY STORAGE CASK DESIGN FEATURES

Characteristic	Transnuklear Models 1200	1700	2100	GNS (Castor) Models IC	V-B&C	REA[a] Model 2023
Capacity [number of assemblies (PWR/BWR)]	12/32	17	21	NA[b]/16	20-24/ 50-52	24/52
Weight (tons)	91	105	115	85	100-125	100
Diameter (ft)	7.7	8	8	NA	7.8	7.8
Length (ft)	17.3	16.1	16.1	18	16	16.1
Heat load (kW)	12	17	15	30	45-55	24-47
Surface dose rate (mrem/hr)	<20	<20	<20	10	10	20
Fuel age [yr (min)]	5	5	5	1	5	5
Materials	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Stainless steel, lead

a. Ridihalgh, Eggers and Associates.
b. Information not available.

4.3 Site Location

For this case study, spent fuel is received at the tuff repository in transportable storage casks while the construction of the waste-handling building is being completed. After initial cask receipt inspections, these casks are stored in the cask storage yard, which is in a restricted area. This cask storage yard is far enough away from constructions activities so that it does not interfere with these activities and not too far from the waste-handling building in order to minimize the cask transport distance when the repository is ready to process the stored spent fuel.

A recommended location is marked on the repository plot plan (Case 1), shown in Figure 3. The repository plot plan for Case 2 is similar to the Case 1 plot plan. A rail spur is used to route the waste shipment (rail engine and cask carrier) to the storage facility. Because of the weight of the metal casks, it is assumed that rail shipment is used.

4.4 Cask-Handling Operations

Table 2 gives the four major cask-handling operations with detailed steps listed for each operation. These activities are described below.

4.4.1 Admit Shipment

The shipment (rail engine and cask carrier) is identified, inspected, admitted through security station gate 3, and moved to the waste receiving and inspection area. There, the shipment is inspected to satisfy any safety, radiological, and security requirements.

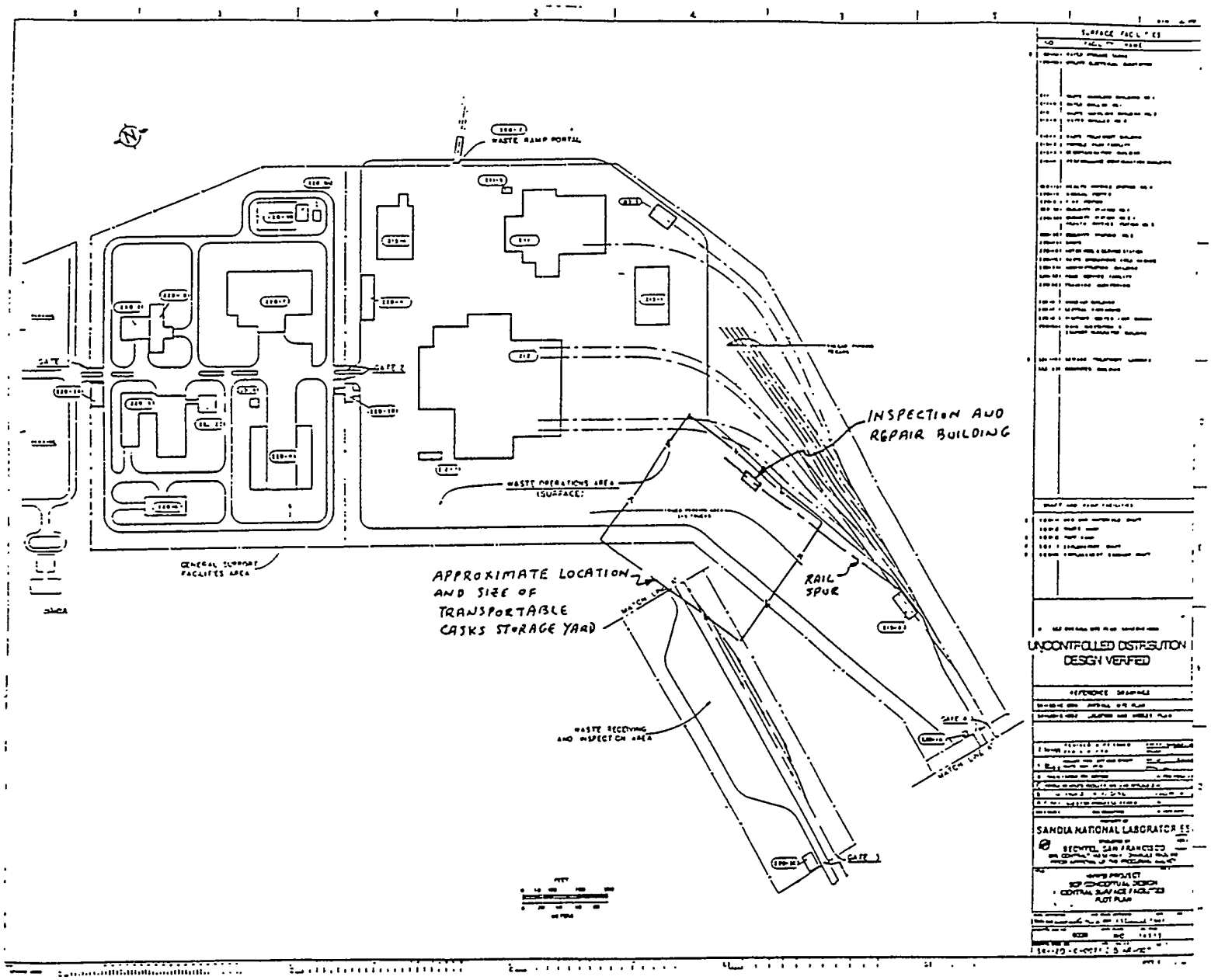


Figure 3. Cask Storage Yard Location

TABLE 2

CASK-HANDLING OPERATIONS

1.0	Admit Shipment
1.1	Identify and admit the shipment (rail engine and cask carrier) through security station gate 3, and inspect the security seals.
1.2	Move the shipment to the waste receiving and inspection area.
1.3	Inspect the rail engine and cask carrier to satisfy safety, radiological, and security requirements.
1.4	Record safety, radiological, and security inspection results.
2.0	Transfer Shipment to Inspection and Repair Building
2.1	Move the rail engine and cask carrier through security station gate 4 to the inspection and repair building.
2.2	Remove the transport cover hood, cask tie-downs, and shock absorbers.
2.3	Lift and rotate the cask to a vertical position, and place it in the inspection station.
2.4	Move the rail engine and empty cask carrier out of the building for return to the utilities.
3.0	Cask Preparation for Storage
3.1	Move the portable platforms to the cask
3.2	Check the condition of the seals and the flushing and cleaning connections.
3.3	Repair the flushing and cleaning connections, if necessary.
3.4	Check and adjust the tension of the bolts.
3.5	Install pressure and temperature sensors once the integrity of the seals has been validated and the space between the primary and secondary lids has been pressurized with helium.
3.6	Move the portable platforms away from the cask.
4.0	Cask Storage
4.1	Move the cask transporter with the facility transfer vehicle to the cask.

TABLE 2

CASK-HANDLING OPERATIONS
(Concluded)

4.2	Lift the cask with the crane on the cask transporter.
4.3	Pull the cask transporter to the storage concrete pad by means of the facility transfer vehicle.
4.4	Back the cask transporter up the concrete pad, and position the cask.
4.5	Lower the cask to its storage position.
4.6	Return the cask transporter and facility transfer vehicle to the inspection and repair building for the next cask.

4.4.2 Transfer Shipment to Inspection and Repair Building

If acceptable, the shipment is moved through security station gate 4 to the inspection and repair building. In the inspection and repair building, the cask is lifted and rotated to a vertical position by the building crane and a lifting yoke, as shown in Figure 4, and placed in the inspection station. The crane has a capacity of 150 tons, enabling it to handle the maximum cask weight of 125 tons plus the weight of the lifting yoke and crane hooks, which is assumed to be less than 25 tons. The crane is also equipped with an auxiliary hook of a 25-ton capacity to assist in the cask rotation and to lift light items such as the cask hoods and shock absorbers.

4.4.3 Cask Preparation for Storage

At the cask inspection station, the condition of the seals and the flushing and cleaning connections is checked. If these connections are damaged, minor repair work is performed. The bolts for the cask lids are checked and adjusted for tension. Pressure and temperature sensors are installed on the cask after the integrity of the seals has been verified and the space between the primary and secondary lids has been pressurized with helium. It is assumed that only minor repairs are performed in this building, and the building serves only as a weather cover for staff personnel. Major repairs, such as opening the lids to get at the cask interior, are not performed in this building. Portable platforms provide personnel with access to the top of the cask.

4.4.4 Cask Storage

There are several methods of handling the cask and transporting them from the inspection and repair building to the storage pads. For this sensitivity study, a cask transporter, as shown in Figure 5, and a facility transfer vehicle are used. The cask

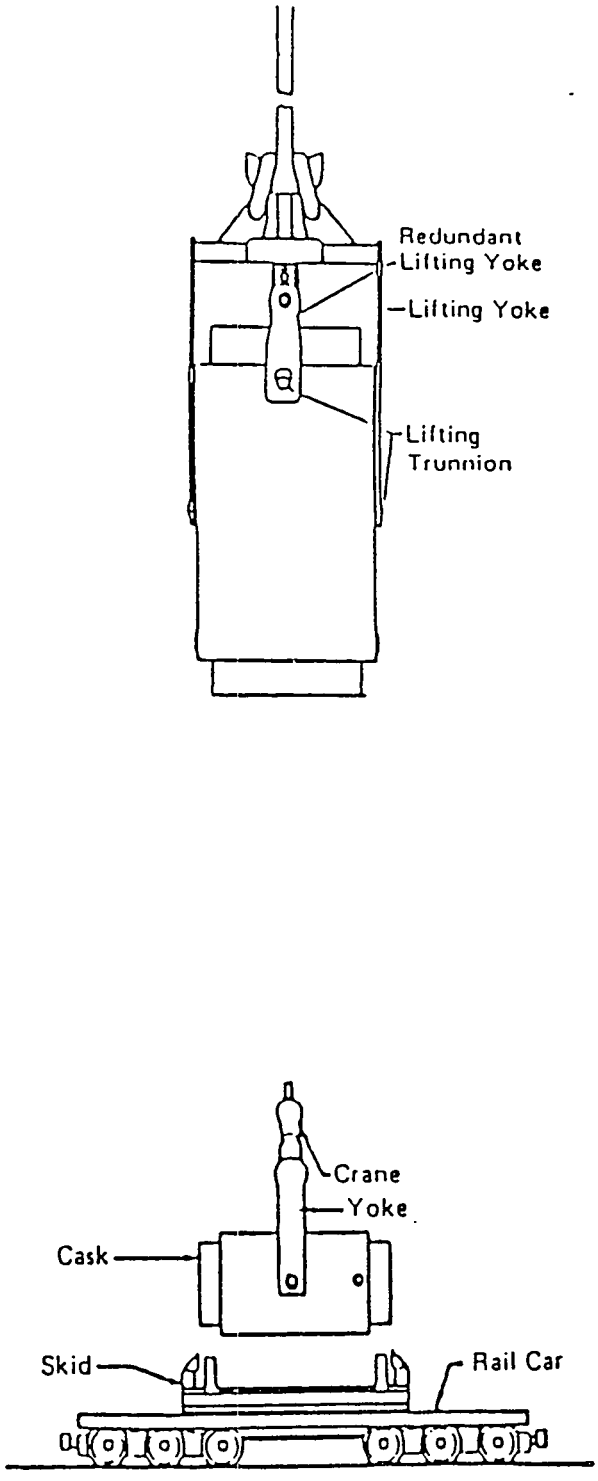


Figure 4. Lifting Cask Off Railcar (Cask Carrier)

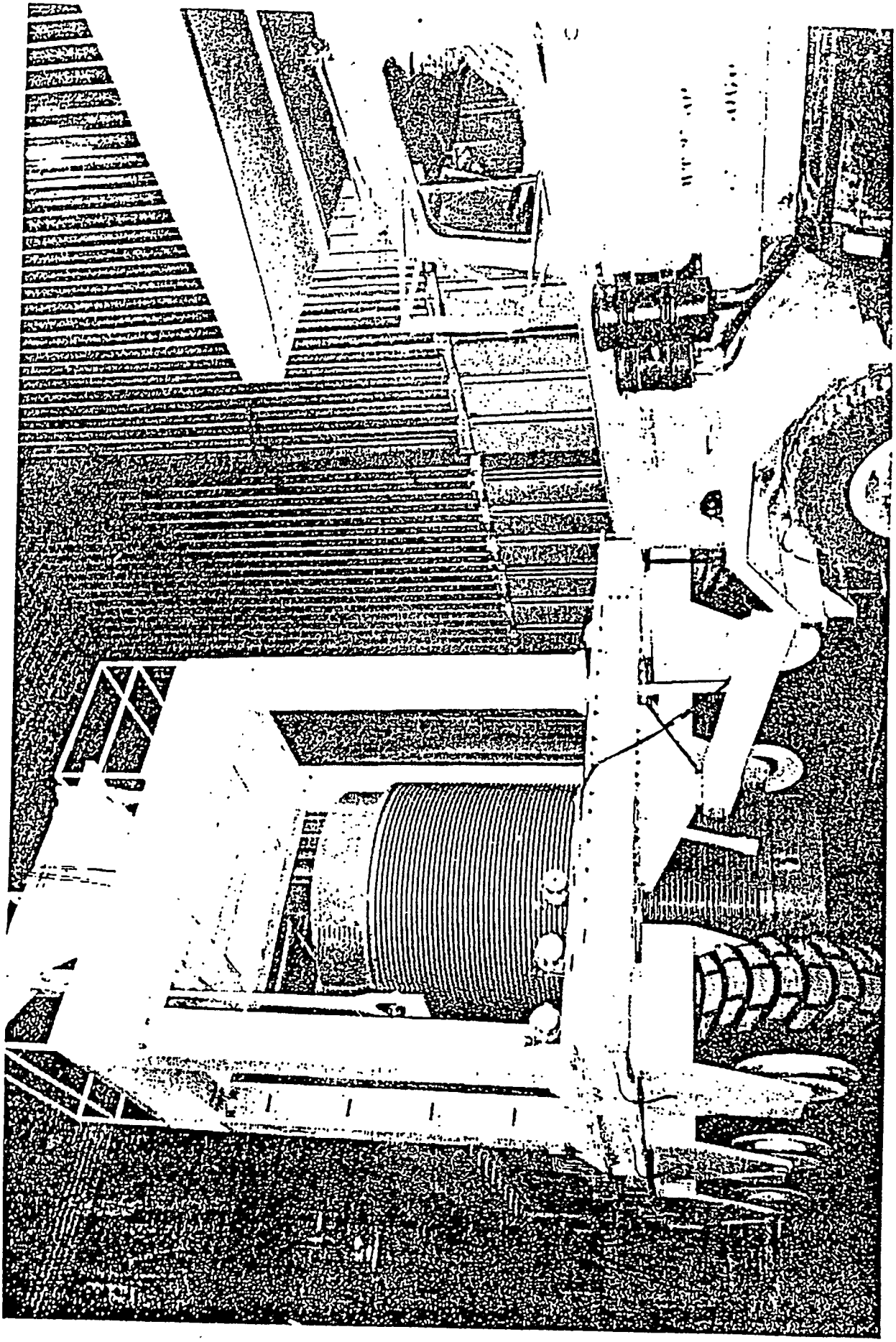


Figure 5. Cask Transporter

transporter is equipped with a crane and a lifting yoke. Virginia Electric and Power Company uses this cask transporter at its Surry Power Station for handling dry metal casks. The facility transfer vehicle that pulls the cask transporter to the storage pads is also used for the transfer of spent fuel (by pulling a rail car loaded with a transportable storage cask) from the cask storage pads to the waste-handling building during repository operation. This vehicle can be purchased early for use in the cask storage yard.

With the cask transporter positioned over the cask, the lifting yoke is engaged with the cask trunnions. The cask is lifted off the ground by the crane on the cask transporter. The cask transporter is pulled by the facility transfer vehicle to the storage pad and then backed up the ramp onto the concrete pad. The cask is lowered to its storage position. The facility transfer vehicle pulls the empty cask transporter back to the inspection and repair building for the next cask.

It is estimated that a total staff of eight people is needed for the cask storage facility. They are as follows:

- Security guard -- 4 (3 shifts/day, 365 days/yr),
- Health physicist -- 1, and
- Cask handlers -- 3.

4.5 Inspection and Repair Building

The inspection and repair building is a corrugated steel building equipped with a 150-ton capacity bridge crane. The building is approximately 60 ft wide, 100 ft long, and 80 ft high. The building serves as a weather cover for the operating staff when the storage cask is in the building for inspection and minor repairs. No major repairs are expected to be performed in this building.

The building is sized to receive the largest rail cask carrier. The engine can be decoupled and stationed outside the building during cask unloading. The building is wide enough to accommodate the rail cask carrier with sufficient space for a cask inspection station. The cask inspection station is equipped with platforms to provide access to the top of the cask for inspection and minor repairs. The building has sufficient headroom for the crane to lift and rotate the cask to a vertical position and place it in the inspection station. There is also space for the cask transporter with its facility transfer vehicle. Access doors are sufficiently high to permit the rail engine, the cask carrier, and the cask transporter to be moved in and out of the building.

Lighting, roof ventilation, toilets, showers, and other supporting utilities are provided in this building.

4.6 Cask Storage Yard

The cask storage yard, shown in Figure 6, requires dimensions of approximately 600 ft x 700 ft. The entire area may be cleared and grubbed and surrounded with a 10-ft-wide gravel road for security. The figure shows three concrete storage pads, each of which can store 24 8-ft-diameter metal casks. Sufficient cask spacing, as recommended by manufacturers, is required to afford access to heavy handling equipment and to allow unrestricted air convection. It must be possible to move one cask without disturbing others. Three concrete storage pads provide sufficient capacity to store the required 750 MTU of spent fuel over the 3-yr period. Additional storage pads can be provided in the easterly direction (Figure 3), if required.

Each concrete storage pad is 32 ft x 192 ft with a 20-ft ramp at each side. The pad is constructed of reinforced concrete 3 ft thick with a minimum 3,000-psi strength. The concrete pad is shown in Figure 7.

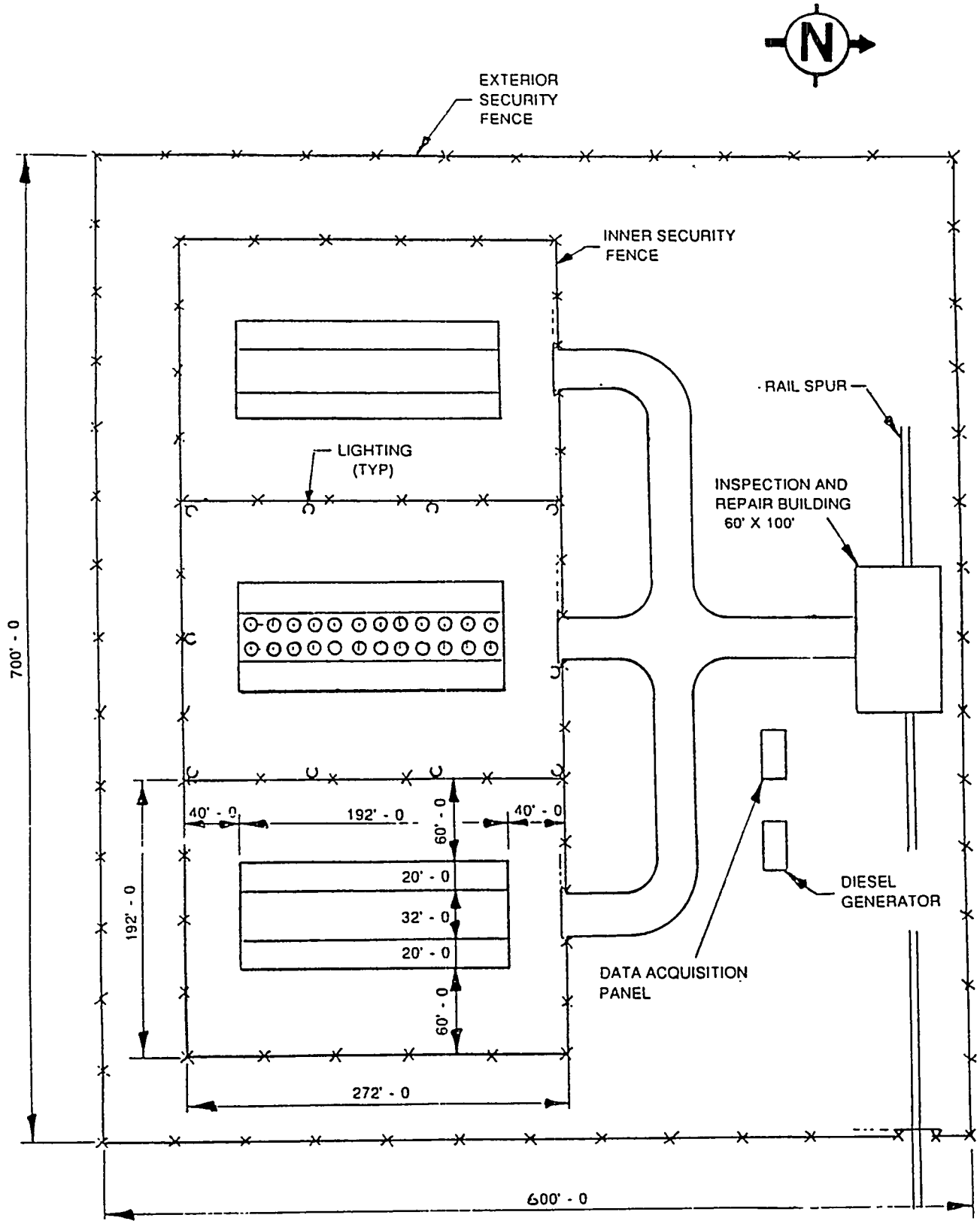


Figure 6. Cask Storage Yard

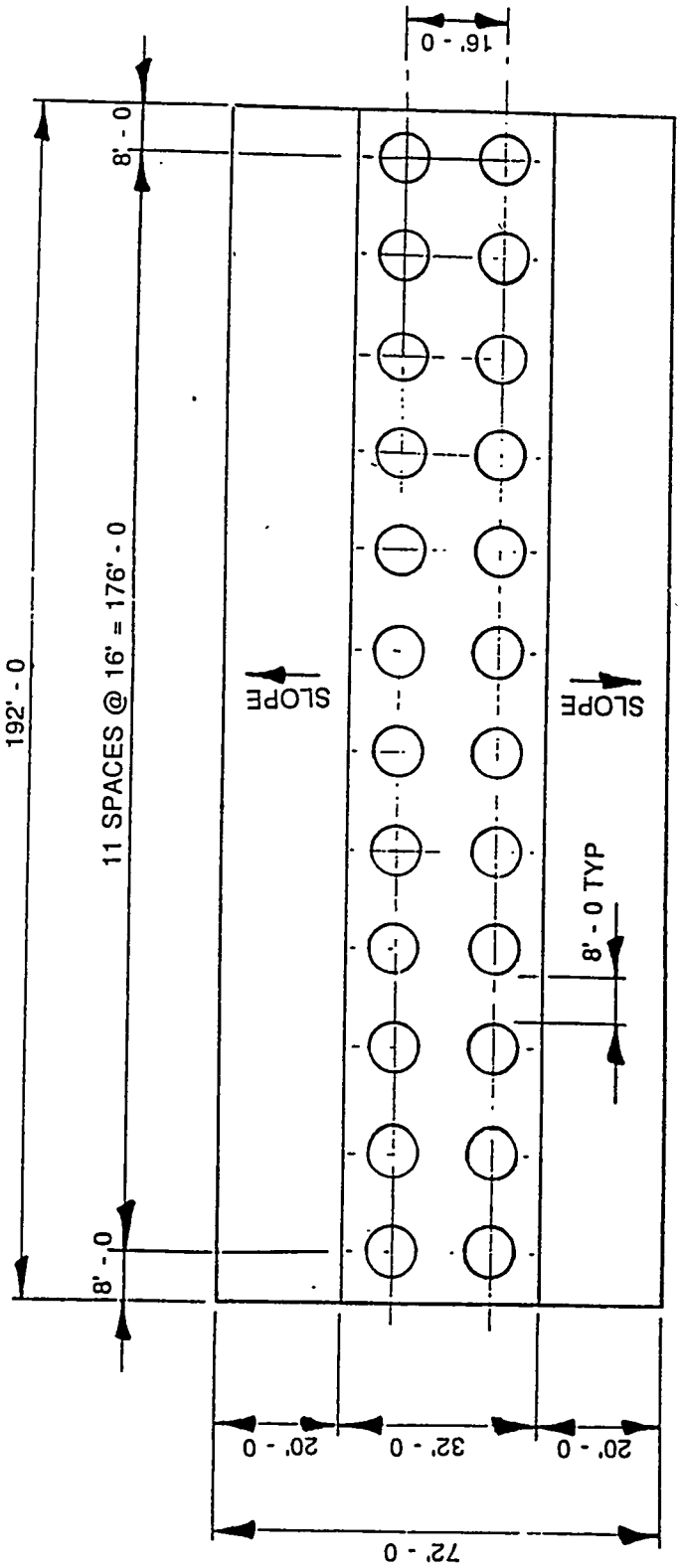


Figure 7. Cask Concrete Storage Pad

The cask storage yard is surrounded by an exterior security fence, with the required security detection. In addition, each concrete storage pad has an inner security fence with sufficient lighting.

Because the casks are sealed and designed for postulated accidents, no airborne or liquid radioactive releases are anticipated. There is no need for either an airborne or a liquid radioactivity monitor. Area radiation monitoring instrumentation is not required, because the cask storage yard is not normally occupied. Portable survey meters are used during periodic surveillance. Periodic inspection of cask seals is the only hands-on activity expected during storage. If any degradation of a seal is detected, the suspect cask is transported to the inspection and repair building for a more detailed investigation.

The type of monitoring equipment depends on the cask design and recommendations from the manufacturer. The REA cask has provisions for monitoring temperature and pressure. The Castor casks are fitted with pressure transmitters to monitor any leakage in the inner vessel. Wiring from the casks is connected to a data acquisition system. The data acquisition system can be located in the storage yard or in the inspection and repair building.

A diesel generator set supplies backup power to the lights and cask monitoring system. The alarms from each cask are monitored at the data-gathering panel. Intrusion detection alarms and selected trouble alarms from the backup power system and the cask-monitoring system are interfaced with the inspection and repair building.

4.7 Radiological Considerations

Additional shielding for the casks and/or the inspection and repair building will reduce dose rates. However, because this facility is located in a remote and controlled area of the repository site, additional shielding is not required. Although no credible mechanism has been identified that could cause the release of the

entire inventory of radioactive noble gases from a cask, such an event must be evaluated. The resultant dose to an individual at the nearest site boundary will be generally a small fraction of the allowable limit. There are no radioactive effluents from this facility.

The facility design must maintain occupational radiation exposures as low as reasonably achievable (ALARA). Storage cask design features that ensure ALARA radiation exposures include the following:

- No operator is required. Routine exposure, other than surveillance and inspection and maintenance, is eliminated.

- Casks are heavily shielded to minimize external dose rates, decontaminated in the plant to remove surface activity, and double-sealed to eliminate gaseous releases to the environment.

- Cooling systems that could become contaminated by leakage are not required.

- The facility is remotely located at the repository site.

- Wide spacing of the casks facilitates surveillance and reduces unnecessary exposures.

4.8 Decommissioning

Casks are easy to decommission at the end of this 3-yr period. When the repository is ready to accept waste, the spent fuel assemblies in these casks are transported to the waste-handling building for packaging or consolidation. Because no cask leakage is anticipated, there should be no residual contamination on the concrete storage pads.

5.0 COSTS AND CONSTRUCTION SCHEDULE

5.1 Capital and Operating Costs

nhe costs associated with the cask storage facility are summarized in Table 3. They include the capital cost of the storage area; the cost of the cask transporter, the facility transfer vehicle, and other equipment; operating costs (additional labor, operating supplies, and maintenance material); and costs to demolish the facility.

The price basis and assumptions for this estimate are the same as those for the MRS System Study for the Repository. In the case of the proposed cask transporter and facility transfer vehicle, a purchase price of $1 million is assumed. This is an extrapolation of cost information from two similar facilities elsewhere.

Operating costs for the facility include the cost of security and operating staff, their operating supplies (on the same basis as the MRS System Study for the Repository), and maintenance materials for the equipment and storage facility. The activities and their durations for the 4 yr of storage facility operation include the following:

Year	Activity	Duration
2001	Cold Operations	4 mo
2001	Receive SNF	8 mo
2002	Receive SNF	12 mo
2003	Receive SNF	6 mo
2003	Transfer SNF to WHB	6 mo
2004	Transfer SNF to WHB	12 mo

TABLE 3

SENSITIVITY STUDY NO. 1
SUMMARY OF LIFE-CYCLE COSTS
(in Millions of 1988 Constant Dollars*)

Cost Category Description	Construction	Operations	Decommissioning	Total
Management and Integration				
Architect/Engineer	1.0	0	0	
Construction Management	1.0	0	0	
Other	0	0	0	
Subtotal	2.0	0	0	2.0
Surface Facilities				
Site	0	0	0	
Waste-Handling Facilities	11.0	3.0	1.0	
Balance of Plant	0	0	0	
Subtotal	11.0	3.0	1.0	15.0
Subsurface Facilities				
Shafts and Ramps	0	0	0	
Excavation and Emplacement	0	0	0	
Service Systems	0	0	0	
Subtotal	0	0	0	0
Total	13.0	3.0	1.0	17.0

* Unescalated for the life of the repository.

It is assumed that the storage facility will be emptied by December 2004. The facility will then be under care and maintenance, with no significant additional operating costs during the remaining years of repository operation. The cost of demolition of the facility after closure is also included in Table 3.

5.2 Construction Schedule

For the purposes of this sensitivity study, it is assumed that the storage facility for transportable storage casks is planned, designed, and licensed as part of the total repository under 10 CFR 60. In other words, the decision to have such a facility is made at approximately the same time that the advanced conceptual design of the repository is authorized.

The significant activities are summarized on Table 4 and are further described as follows.

The cask storage facility could begin operations as early as April 2000 if (1) the NRC grants authorization to start construction of the repository in January 1998, and (2) the construction of the offsite rail line can begin as soon as construction authorization is granted. The time required for construction, verification, acceptance, and cold operations of the cask storage facility is 10 mo. Based on the earliest start date for the facilities, this period is February 1998 through December 1998. The time required for construction, verification, acceptance, and cold operation of the offsite rail line is 26 mo. Based on the earliest start date for the rail line, this period is February 1998 through March 2000.

The capacity of the proposed storage facility will not be exceeded if (1) the waste emplacement operations begin in early 2003 and (2) the first waste is received at the transportable cask storage facility in early 2001.

TABLE 4

MRS SENSITIVITY STUDY NO. 1 SCHEDULE ACTIVITY DURATION SUMMARY

Activity	Duration (mo)	Date		Note
		Beginning	Complete	
Construction authorization	0	Jan '98	-	
Site preparation--onsite	10	Feb '98	Nov '98	
Storage facility construction	6	Mar '98	Aug '98	(May be postponed up to 2 yr)
Verification, acceptance, and cold operation	4	Sep '98	Dec '98	
Offsite railroad--construction	25	Feb '98	Feb '00	
Offsite railroad--verification, acceptance, and cold operation	6	Oct '99	Mar '00	
Storage facility ready to receive casks		Apr '00		
Receive 300 MTU	12	Jan '01	Dec '01	
Receive 300 MTU	12	Jan '02	Dec '02	
Receive 150 MTU	6	Jan '03	June '03	

6.0 REFERENCES

DOE (Department of Energy), August 2, 1988. MRS Systems Studies, Task A Report, Final Draft.

DOE (Department of Energy), August 19, 1988. MRS Systems Study, Task A Clarification.

GNSI, General Nuclear Systems, Inc. Avon, Connecticut. January 1985, Revision 1. Typical Safety Analysis Report for the Castor V/21 Cask, Independent Spent Fuel Storage Installation (Dry Storage).

Ridihalgh, Eggers and Associates, Inc. Topical Report for the REA 2023 Dry Storage Cask for BWR Spent Fuel.

MRS SENSITIVITY STUDY NO. 2:

CONTAINERIZING DHLW AT THE REPOSITORY FOR CASES 6, 7, 8, AND 9 OF THE MRS SYSTEM STUDY

MRS SENSITIVITY STUDY NO. 2

CONTAINERIZING DHLW AT THE REPOSITORY FOR
CASES 6, 7, 8, AND 9 OF THE MRS SYSTEM STUDY

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1.0 INTRODUCTION

The MRS System Study for the Repository evaluated nine cases containing variations in packaging, transportation, and repository and MRS functions. In Cases 6, 7, 8, and 9 of that study, spent fuel assemblies and defense high-level waste (DHLW) are containerized at the MRS and shipped by rail to the repository for emplacement. In Cases 6 and 7, the spent fuel assemblies are not consolidated; in Cases 8 and 9, the spent fuel assemblies are consolidated at the MRS. In Cases 6 and 8, defective containers are shipped back to the MRS for repair; in Cases 7 and 9, the defective containers are repaired at the repository.

The purpose of this sensitivity study is to evaluate for Cases 6, 7, 8, and 9 of the MRS System Study for the Repository the impact on the repository construction and operating cost of adding containerizing capabilities at the repository for 200 and 400 MTU/yr of DHLW.

2.0 SUMMARY

To containerize 400 MTU/yr of DHLW, the cost of additional staffing is $6 million and the container cost is $216 million for the 17 yr during which the DHLW is received and containerized. The additional capital cost is $4 million. Thus, the total additional repository operating and capital cost for this capability is $226 million.

To containerize 200 MTU/yr of DHLW, the cost of additional staffing is $6 million and the container cost is $108 million for the 17 yr during which the DHLW is received and containerized. The additional capital cost is $4 million. The total additional operating and capital cost of the repository for this capability is $118 million.

3.0 DISCUSSION

The addition of DHLW containerization at the repository results in two additional operating costs: additional staffing costs and DHLW container costs. It is estimated that the repository staff requires four additional persons to add DHLW containerizing at the repository, whether the DHLW receipt rate is 200 or 400 MTU/yr. These include a weld/decon cell process operator, a hot maintenance engineer, an electrical/mechanical repairman, and an additional health physics technician. The annual cost of this additional staffing is estimated to be $350,000. For the 17 yr during which this waste is received, the additional staffing costs $6 million.

Based on a receipt of 400 MTU/yr of DHLW and 0.5 MTU/container, 800 containers per year, or a total of 12,680 containers of DHLW, are received at the repository during its operating life. The years during which the containers are received at the repository are shown in Table 1.

At a cost of $17,000 per DHLW container, the cost (to the nearest million dollars) of 12,680 containers is $216 million.

The container cost for 200 MTU of DHLW is one half the container cost of 400 MTU of DHLW, or $108 million.

The capital cost of the repository increases by $4 million as a result of adding the capability to containerize either 200 MTU/yr or 400 MTU/yr of DHLW at the repository. This additional capital cost consists of the costs for additional building space and additional equipment.

TABLE 1

WASTE RECEIVED AT THE REPOSITORY

Year	MTU - First Repository			HLW Containers	
	Spent Fuel	HLW	Cum.	DHLW	WVHLW
2003	400	0	400	0	0
2004	400	0	800	0	0
2005	400	0	1200	0	0
2006	900	0	2100	0	0
2007	1800	0	3900	0	0
2008	3000	400	7300	800	0
2009	3000	400	10700	800	0
2010	3000	400	14100	800	0
2011	3000	400	17500	800	0
2012	3000	400	20900	800	0
2013	3000	400	24300	800	0
2014	3000	400	27700	800	0
2015	3000	400	31100	800	0
2016	3000	400	34500	800	0
2017	3000	400	37900	800	0
2018	3000	400	41300	800	0
2019	3000	400	44700	800	0
2020	3000	400	48100	800	0
2021	3000	400	51500	800	0
2022	3000	400	54900	800	0
2023	3000	400	58300	680	28
2024	3000	400	61700	0	188
2025	3000	180	64880	0	84
2026	2700	0	67580	0	0
2027	2420	0	70000	0	0
TOTALS	63020	6980	70000	12680	300

MRS SENSITIVITY STUDY NO. 3:

REACTOR OVERSPILL FUEL

MRS SENSITIVITY STUDY NO. 3

REACTOR OVERSPILL FUEL

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1.0 INTRODUCTION

The MRS System Study for the Repository evaluated nine cases containing variations in packaging, transportation, and repository and MRS functions. In Cases 1 and 2 of that study, it is assumed that there is no MRS. In Case 1, the spent fuel assemblies are shipped intact and then consolidated and containerized at the repository. In Case 2, the spent fuel assemblies are shipped intact to the repository, where they are containerized without consolidation.

The purpose of this sensitivity study is to evaluate, for Cases 1 and 2 of the MRS System Study for the Repository, the impact on the repository operating cost of receiving a portion of the spent fuel at the repository as overspill fuel from the reactors in the form of consolidated fuel in square open canisters.

2.0 SUMMARY

For Cases 1 and 2, the receipt of canistered overspill fuel at the repository has no impact on the repository design and its construction cost, and no significant impact on the repository operating cost, except for the cost due to the change in the number of containers.

For Case 1, the receipt of canistered overspill fuel at the repository results in 108 additional spent fuel containers and 67 fewer hardware containers than there would be if canistered overspill fuel were not received at the repository. The impact of the revised number of containers on the operating cost of the repository is a $1-million increase.

For Case 2, the receipt of canistered overspill fuel at the repository results in 1,172 fewer spent fuel containers than there would be if canistered overspill fuel were not received at the

repository. The impact of the reduced number of containers on the operating cost of the repository is a $36-million cost reduction.

3.0 ASSUMPTIONS

- The annual receipt rate of reactor overspill (MTU) is shown in Table 1. The overspill fuel is part of the 3,000 MTU received at the repository.

- The overspill fuel is packaged at the reactors in square canisters that have the same outer dimensions as intact fuel assemblies.

- Two fuel assemblies are consolidated into each canister.

- Canistered fuel is shipped from the reactors to the repository in the same casks that are used to ship intact fuel for Cases 1 and 2.

- Canistered fuel is packaged at the repository in the same containers that are used for intact fuel for Cases 1 and 2.

- Hardware disposal and its associated costs are considered to be the responsibility of the reactor operators.

- For Case 1, there are 6 intact BWR SNF assemblies or canisters per container.

- For Case 1, there are 18 consolidated BWR SNF assemblies per container.

- For Case 1, there are 3 intact PWR SNF assemblies or canisters per container.

TABLE 1

ANNUAL RECEIPT OF REACTOR OVERSPILL (MTU)
TUFF 1ST REPOSITORY/NO MRS
NO NEW ORDERS, END OF LIFE

Year	PWR	BWR
2003	0	0
2004	0	0
2005	0	0
2006	1	14
2007	0	0
2008	28	0
2009	7	5
2010	13	34
2011	11	368
2012	390	71
2013	11	129
2014	394	19
2015	290	0
2016	393	57
2017	133	194
2018	57	28
2019	31	65
2020	404	252
2021	137	10
2022	90	0
2023	144	0
2024	78	0
2025	602	64
2026	0	61

- For Case 1, there are 6 consolidated PWR SNF assemblies per container.

- For Case 2, there are 4 PWR SNF assemblies or canisters per hybrid container in the PWR-only configuration.

- For Case 2, there are 4 BWR SNF assemblies or canisters per hybrid container.*

- For Case 2, there are 3 PWR SNF assemblies or canisters per hybrid container.

- Each BWR assembly contains 0.18 MTU.

- Each PWR assembly contains 0.43 MTU.

4.0 CASE 1

Based on the receipt rates shown in Table 1, a total of 7,617 BWR assemblies and 7,474 PWR assemblies are received as overspill fuel during the life of the repository. With 2 assemblies per canister and 6 canisters per BWR container, 635 BWR containers are required for the overspill fuel. With 2 assemblies per canister and 3 canisters per PWR container, 1,246 PWR containers are required for the overspill fuel. The total number of containers (BWR and PWR) required for overspill fuel is 1,881.

Without the receipt of overspill fuel, 95% of the 7,617 BWR assemblies are consolidated at the repository and the required number of BWR containers is calculated as follows:

*The use of the hybrid container is preferred. After all of the BWR assemblies, along with the PWR assemblies, have been packaged in the hybrid containers, the remaining PWR assemblies are packaged in PWR containers. (Hybrid containers can accommodate all of the BWR assemblies but not all of the PWR assemblies.)

Consolidated BWR Fuel:
7,617 assemblies x 0.95 E 18 assemblies/container = 402 containers.

Intact BWR Fuel:
7,617 assemblies x 0.05 E 6 assemblies/container = 63 containers.

Total BWR containers = 402 + 63 = 465 containers.

Hardware
For every 108 BWR fuel assemblies that are consolidated, one hardware container is required.

7,617 assemblies x 0.95 E 108 = 67 hardware containers.

Without the receipt of overspill fuel, 95% of the 7,474 PWR assemblies are consolidated at the repository, and the required number of PWR containers is calculated as follows:

Consolidated PWR Fuel
7,474 assemblies x 0.95 E 6 assemblies/container =
1,183 containers.

Intact PWR Fuel
7,474 assemblies x .05 E 3 assemblies/container = 125 containers.

Total PWR containers = 1,183 + 125 = 1,308 containers.

Without the receipt of overspill fuel, the total number of containers (BWR and PWR) required for the 7,617 BWR assemblies and the 7,474 PWR assemblies is 1,773.

Thus, for Case 1, the receipt of overspill fuel at the repository results in 108 more spent fuel containers and 67 fewer hardware containers than there would be if no overspill fuel were received.

The cost of each spent fuel container is $29,000, and the cost of each hardware container is $26,000. The impact on the operating cost (to the nearest million dollars) of the repository resulting from the receipt of the overspill fuel is

($29,000 x 108) - ($26,000 x 67) = $1 million additional cost.

5.0 CASE 2

Based on the receipt of 7,617 BWR assemblies as overspill fuel during the life of the repository, 2 assemblies per canister, and 4 BWR canisters per hybrid container, 952 hybrid containers are required for BWR overspill fuel.

Based on 2 assemblies per canister and 3 PWR canisters per hybrid container, 952 hybrid containers will accommodate 5,712 PWR assemblies as canistered overspill fuel. The remaining 1,762 PWR assemblies (7,474 - 5,712) are packaged in hybrid containers as in the PWR-only configuration. Based on 2 assemblies per canister and 4 PWR canisters per hybrid container (in the PWR-only configuration), 220 hybrid containers will accommodate the 1,762 PWR assemblies.

Thus, the total number of containers required for overspill fuel is 952 (BWR and PWR configuration) plus 220 (PWR-only configuration), or 1,172.

Without the receipt of overspill fuel at the repository, 2,344 containers (twice as many as with the receipt of overspill fuel) are required because fuel is not consolidated 2 to 1. Therefore, for Case 2, the receipt of overspill fuel at the repository results in 1,172 fewer containers than there would be if no overspill fuel were received.

The reduction of the number of shipping casks received, along with the increase (Case 1) or reduction (Case 2) of containers required due receipt of overspill fuel from the reactors in the form of consolidated fuel in square open canisters, has no impact on the design of the repository or its construction cost. The only significant operating cost impact is considered to be that due to the change in the number of containers and their associated costs.

The cost of each spent fuel container is $31,000. The impact on operating cost (to the nearest million dollars) of the repository resulting from the receipt of the overspill fuel is $31,000 x 1,172, or a reduction of $36 million.

MRS SENSITIVITY STUDY NO. 4:

NUTECH/NUHOMS SHIPMENTS

MRS SENSITIVITY STUDY NO. 4

NUTECH/NUHOMS SHIPMENTS

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1.0 INTRODUCTION

The MRS System Study for the Repository evaluated nine cases containing variations in packaging, transportation, and repository and MRS functions. In Cases 1 and 2 of that study, it is assumed that there is no MRS. In Case 1, the spent fuel assemblies are shipped intact and then consolidated and containerized at the repository. In Case 2, the spent fuel assemblies are shipped intact to the repository, where they are containerized without consolidation.

The purpose of this sensitivity study is to estimate, for Cases 1 and 2 of the MRS System Study for the Repository, the differential construction and operating costs associated with the receipt of reactor overspill fuel in the form of intact fuel shipped in NUTECH horizontal modular storage (NUHOMS) canisters.

2.0 SUMMARY

Adding the capability of receiving and handling NUHOMS canisters at the repository will result in the following additional costs for both Cases 1 and 2:

Cost Account	Estimated Cost ($1988)
Construction	11 million
Operation	23 million*
Decommissioning	1 million
Total	35 million

No additional spent fuel emplacement containers are needed as a result of receiving and handling NUHOMS canisters.

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*The estimated $23 million for operating costs includes $5 million for offsite disposal of empty NUHOMS canisters, but does not include costs for transportation to and from the repository or for the specially designed casks that will be required.

3.0 ASSUMPTIONS

- The annual receipt rates of reactor overspill fuel are shown in Table 1. The overspill fuel is part of the 3,000 MTU received at the repository each year.

- The overspill fuel is shipped in NUHOMS-24P Dry Shielded Canisters, which have the characteristics listed in Table 2. A cut-away view of the canister is shown in Figure 1.

- This sensitivity study assumes that a partially full NUHOMS canister would be shipped to the repository during years in which the amount of reactor overspill would only partially fill the canister.

- The NUHOMS canisters are shipped to the repository in shielded casks that have similar outer dimensions and weight as spent fuel rail casks in Cases 1 and 2. Also, the casks are handled in a manner similar to those in Cases 1 and 2.

- Reactor overspill fuel is containerized at the repository in the same type of containers that are used for other spent fuel in Cases 1 and 2.

- Disposal of the empty NUHOMS canisters is the responsibility of the repository. The shipping casks for NUHOMS canisters will be returned in an empty condition to the offsite owners.

- Remote operations will be necessary for cutting the seal welds on the tops of the NUHOMS canisters and for packaging the empty NUHOMS canisters for disposal.

- Each BWR assembly contains 0.18 MTU and each PWR assembly contains 0.43 MTU.

TABLE 1

ANNUAL RECEIPT RATES OF REACTOR OVERSPILL FUEL
SHIPPED IN NUHOMS CANISTERS

YEAR	Receipt Rate (MTU/yr) PWR	BWR
2003	0	0
2004	0	0
2005	0	0
2006	1	14
2007	0	0
2008	28	0
2009	7	5
2010	13	34
2011	11	368
2012	390	71
2013	11	129
2014	394	19
2015	290	0
2016	393	57
2017	133	194
2018	57	28
2019	31	65
2020	404	252
2021	137	10
2022	90	0
2023	144	0
2024	78	0
2025	602	64
2026	0	61

TABLE 2

CHARACTERISTICS OF NUHOMS-24P CANISTERS*

Item	Value or Type
Length	4.64 m (186.5 in.)
Diameter	1.71 m (67.24 in.)
Wall Thickness	16 mm (0.625 in.)
Capacity	24 PWR or 52 BWR assemblies (intact)
Weight (Loaded)	36,290 kg (80,000 lb)
Average End Surface Dose Rate	Less than 200 mrem/hr
Material	Stainless steel with lead end-shields

* Source: McConaghy, 1988.

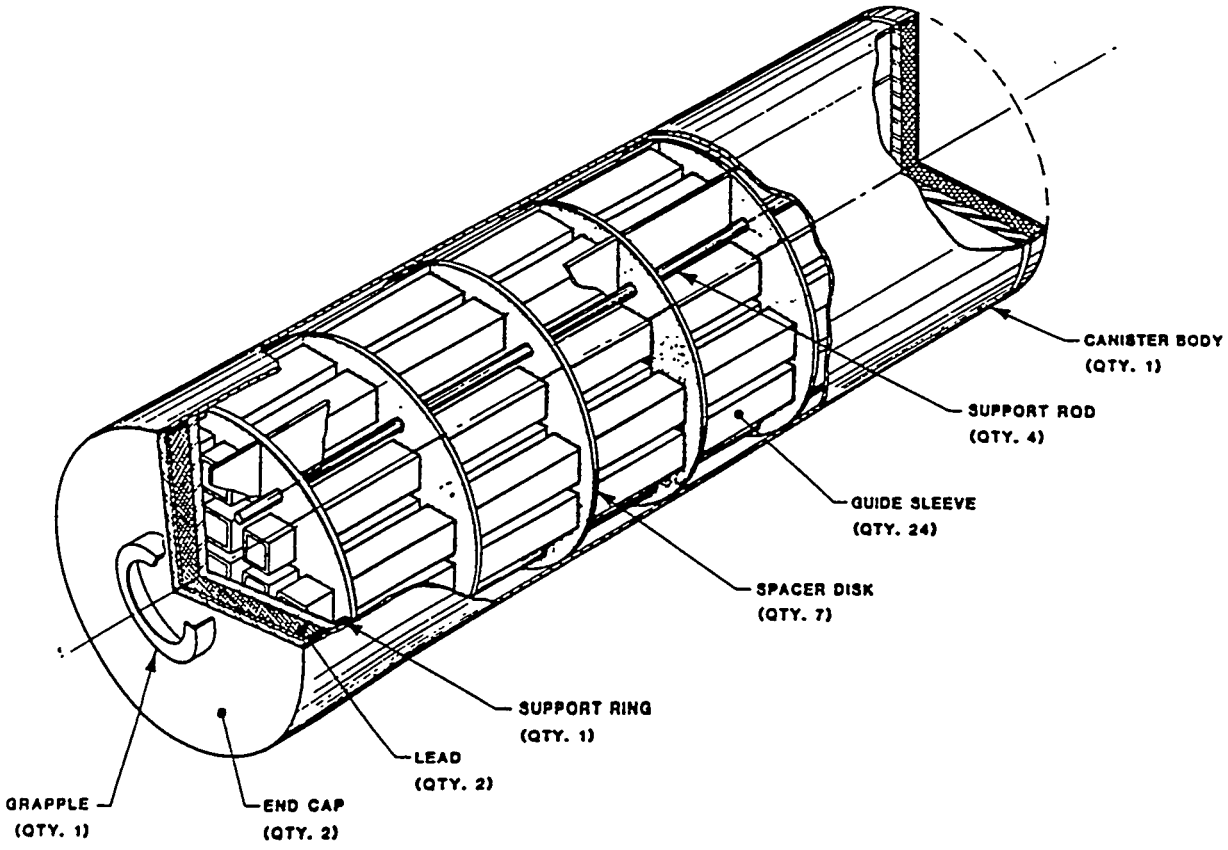


Figure 1. NUHOMS-24P Canister
(from McConaghy et al., 1988)

- Other assumptions are the same as those identified in the MRS System Study for Cases 1 and 2.

4.0 ANALYSIS

The annual rates of receipt of NUHOMS canisters at the repository are shown in Table 3. The receipt rate varies each year up to a maximum of 66 canisters in the year 2020.

The NUHOMS cask-receiving, spent fuel unloading, and cask shipping operations at the repository are similar to those for receiving, unloading and shipping spent fuel rail casks in Cases 1 and 2. However, handling of the NUHOMS canisters will require the following additional operations compared to the spent fuel handling in Cases 1 and 2:

- The NUHOMS canisters have redundant seal welds that must be cut before spent fuel assemblies can be removed.

- After fuel unloading, the canisters will be removed from their shipping casks into a shielded hot cell.

- The NUHOMS canisters will be packaged in specially designed cylindrical liners for offsite disposal.

- Additional maintenance, training, procedure development, supervision, and other support activities will be necessary for handling NUHOMS canisters.

The additional operations described above will require additional space and equipment in the waste-handling building. The additional structures and space requirements for Cases 1 and 2 are shown in Figures 2 and 3, respectively. An additional cask receiving and shipping bay, an extension to the unloading hot cell, and an additional unloading port will be needed for both Cases 1 and 2.

TABLE 3

ANNUAL RECEIPT RATES OF
REACTOR OVERSPILL FUEL IN NUHOMS CANISTERS

	PWR SPENT FUEL			BWR SPENT FUEL			
YEAR	MTU	Assem-blies	NUHOMS Canisters	MTU	Assem-blies	NUHOMS Canisters	TOTAL NUHOMS CANISTERS
2003	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0
2006	1	2	1	14	78	2	3
2007	0	0	0	0	0	0	0
2008	28	65	3	0	0	0	3
2009	7	16	1	5	28	1	2
2010	13	30	1	34	189	4	5
2011	11	26	1	368	2,044	39	40
2012	390	907	38	71	394	8	46
2013	11	26	1	129	717	14	15
2014	394	916	38	19	106	2	40
2015	290	674	28	0	0	0	28
2016	393	914	38	57	317	6	44
2017	133	309	13	194	1,078	21	34
2018	57	133	6	28	156	3	9
2019	31	72	3	65	361	7	10
2020	404	940	39	252	1,400	27	66
2021	137	319	13	10	56	1	14
2022	90	209	9	0	0	0	9
2023	144	335	14	0	0	0	14
2024	78	181	8	0	0	0	8
2025	602	1,400	58	64	356	7	65
2026	0	0	0	61	339	7	7
			313			149	462

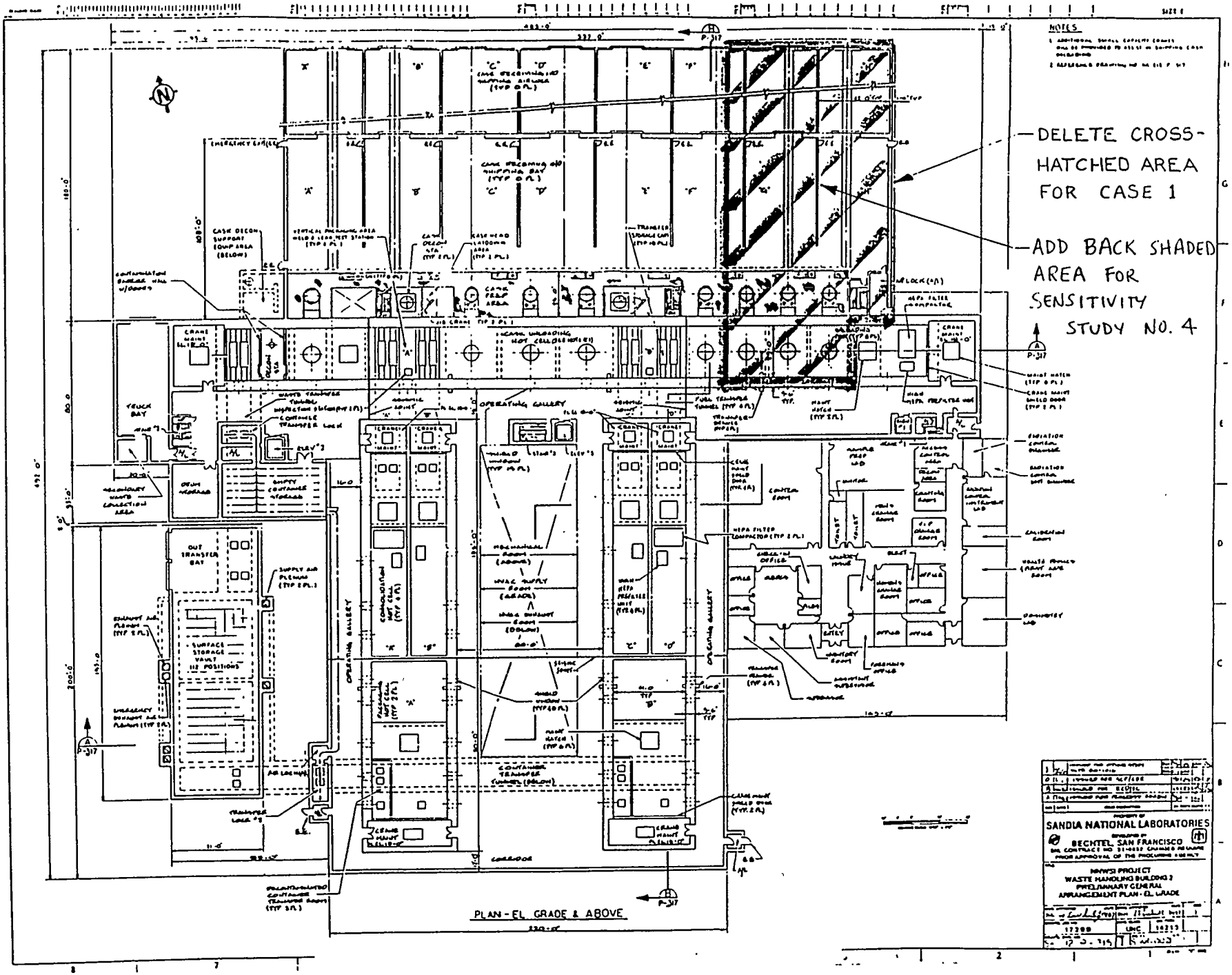


Figure 2. Additional Structures to Accommodate NUHOMS Canisters in Case 1

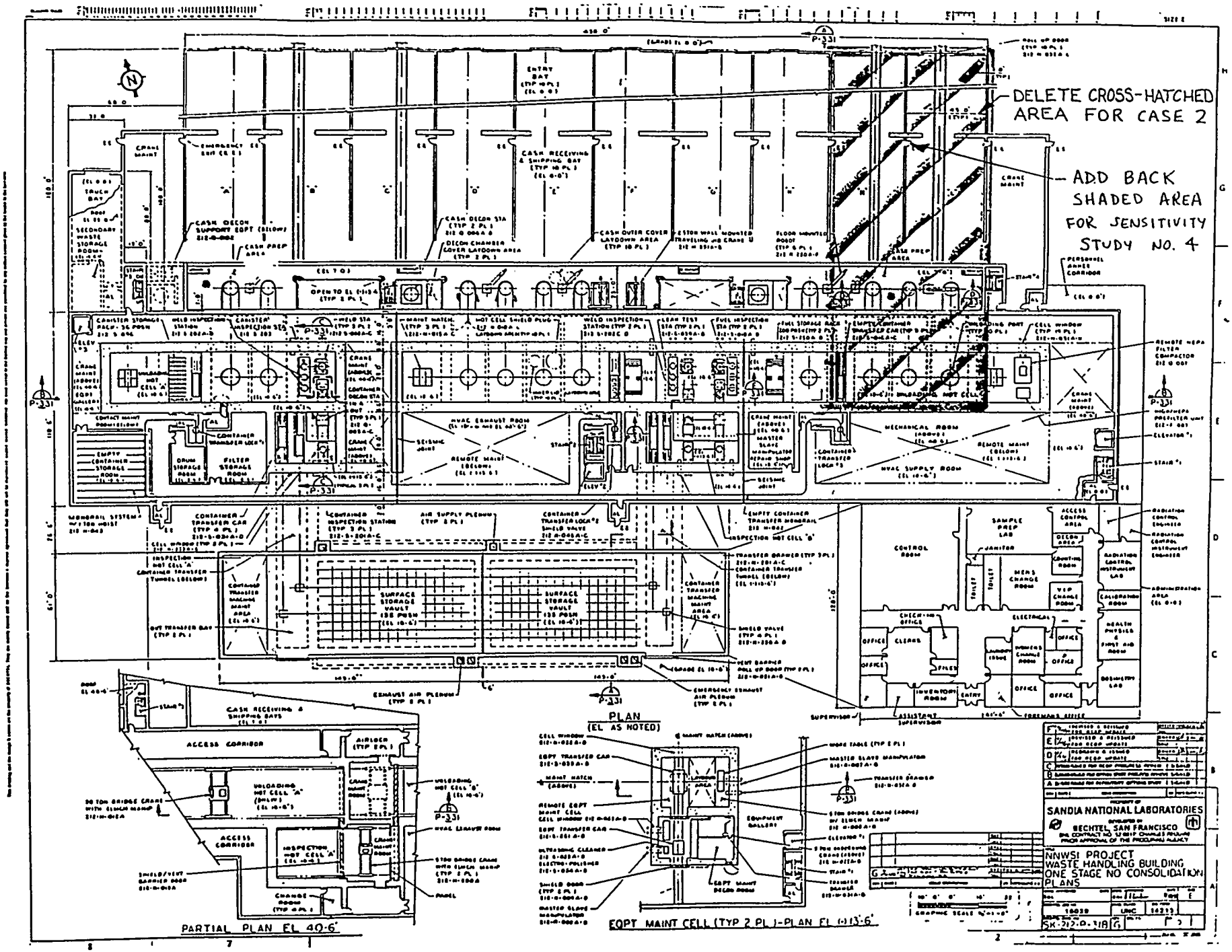


Figure 3. Additional Structures to Accommodate NUHOMS Canisters in Case 2

The following additional equipment is required to receive, handle, and dispose of NUHOMS canisters:

- cask transfer car,
- remotely operated seal weld cutter on gantry crane,
- electromechanical manipulator, and
- upgrade capacity of unloading hot cell bridge crane from 20 tons to 30 tons.

Additional repository operating personnel will be needed to perform the additional tasks associated with handling NUHOMS canisters. About 200 manhours of labor are estimated to be needed for the additional work associated with handling and processing each NUHOMS canister.

When a NUHOMS cask is received at the repository, it will be transferred into the waste-handling building and prepared for unloading in a manner similar to that for spent fuel rail casks. However, after the cask is positioned under the port in the unloading hot cell, the seal welds on the NUHOMS canister will need to be cut. A remotely operated seal weld cutter will be positioned over the top of the canister by an in-cell gantry crane, which will support and control a seal weld cutting or grinding machine. Local vacuum or ventilation exhaust systems will be used to collect dust generated during cutting and grinding operations. The first seal weld will be cut and the first cover will be removed from the canister top and placed in the hot cell using a jib crane. The second seal weld will then be cut and the shielded top of the NUHOMS canister will be removed into the hot cell. The spent fuel assemblies can then be unloaded with the overhead bridge crane as in Cases 1 and 2.

After unloading the spent fuel assemblies, the empty NUHOMS canister will be removed from the cask and placed in the unloading hot cell. The lifting operation will be performed by an unloading

hot cell bridge crane with a capacity of 30 tons. The empty NUHOMS cask will be transferred back into the cask preparation area and shipped offsite in a manner similar to that for other empty casks. A specially designed cylindrical cask with liner will be placed on the cask transfer car and positioned under the unloading port. The empty NUHOMS canister, including the shielded top and cover, will be placed in the cask liner (using the hot cell bridge crane) and packaged for disposal. The liner will be sealed in a manner similar to that for other packages for site-generated waste. The electromechanical manipulator will support the cutting, rigging, and packaging operations. The empty NUHOMS canister (in the liner and cask) will be transferred into the cask receiving and shipping bay where it will be prepared for shipment offsite and disposed of as with site-generated waste. The estimated quantity of additional waste is about 400 ft^3/NUHOMS canister.

Additional equipment maintenance, operator training, procedure development, supervision, and other supporting activities will also be necessary.

5.0 ESTIMATED CAPITAL AND OPERATING COSTS

The additional costs associated with handling NUHOMS canisters at the repository include capital costs of the additional space and equipment, operating costs (additional labor, supplies, and maintenance material), and decommissioning costs. No additional waste emplacement containers are needed as a result of receiving and handling NUHOMS canisters.

For both Cases 1 and 2, the additional costs are estimated to be $11 million for capital costs, $23 million for operating costs, and $1 million for decommissioning. These estimates are in 1988 dollars, unescalated for the life of the repository.

The price basis and assumptions for this estimate are the same as for the MRS System Study for the Repository. In the case of the proposed specialized equipment to handle the NUHOMS canisters, a purchase price of $2 million is assumed. This is an extrapolation of cost information from more conventional equipment elsewhere.

Operating costs for the facility include the cost of operating staff, their operating supplies, and maintenance materials for the equipment and facility (on the same basis as the MRS System Study). The operating staff costs for processing the NUHOMS canisters were calculated by multiplying the number of additional required manyears by the cost per manyear. It is estimated that 200 additional manhours are required to process each NUHOMS canister, and a total of 462 NUHOMS canisters are received at the repository (see Table 3). Thus, a total of 92,400 manhours (46 manyears) are required to process the NUHOMS canisters over the life of the repository.

The estimated $23 million for operating costs includes $5 million for offsite disposal of empty NUHOMS canisters but does not include costs for transportation to and from the repository or for the specially designed casks that will be required.

The annual receipt rates of NUHOMS canisters are very variable and it is assumed that additional staff (peaking at 5 persons) will be used for the period 2011 to 2026. Before then, the few canisters will be handled by using overtime.

6.0 REFERENCES

McConaghy, W. J., R. A. Lehnert, and R. J. Deese, 1988. Design and Operation of a Large Capacity Horizontal Concrete Modular Storage System for Irradiated Nuclear Fuel, NUTECH, San Jose, CA.

Appendix D

DOCUMENTATION OF BASES AND ASSUMPTIONS

This appendix consists of a variety of historical documents. The quality and legibility of many are quite poor, but the reproductions were made from the available originals.

United States Government | Department of Ener

memorandum

05073

#6 DATE: August 2, 1988 Final Report for system task A 8/3/88.

REPLY TO ATTN OF: RW-30

SUBJECT: MRS Systems Studies, Task A Report

TO: S. Kale, RW-20

This is in response to your memorandum of July 15, 1988, which provided comments on the proposed final report for Task A of the MRS System Studies. Our responses to your comments have been developed in coordination with your staff and are given in Attachment 1 to this memorandum. These responses have been incorporated into the revised Task A report, shown in Attachment 2.

During the course of meetings and discussions with study participants to resolve these comments, two additional items were discussed and resulted in changes to the Task A report. These are:

- Section H, Sensitivity Analyses, has been modified to include a comparison of the effect of using the waste acceptance schedules shown in the draft Mission Plan Amendment versus the waste acceptance schedules used in Part II of Task A. While we believe this comparison will show little effect on system trade-offs, it is included to address explicitly how altering the facility ramp-up rates impact the system.

- In section G, item 6, the assumption on the amount of fuel that would not be consolidated, when the reference system incorporates consolidation, has been changed from 10% to 5%. Results from PCDP efforts and previous PNL estimates show that the percentage should be below 3%. Accordingly, 5% was selected for the purposes of these studies as a more realistic, but still conservative, estimate of the amount of fuel that would not be consolidated.

Your concurrence with these revisions is kindly requested, as noted below.

Ralph Stein

Ralph Stein
Acting Associate Director Office of
Systems Integration
and Regulations

Attachments

A.H. Kale I concur with the attached Task A report.
8/2/88

cc: S. Rousso, RW-10
T. Isaacs, RW-40
K. Klein, RW-30
J. Saltzman, RW-20
C. Kouts, RW-323
E. Regnier, RW-331
W. Danker, RW-321
M. Frei, RW-22
J. Hale, RW-222
D. Siefken, Weston

ATTACHMENT 1

Response to Comments of the
Office of Facilities Siting and Development
on the
Proposed Final Report for Task A of the MRS Systems Study

1. As recommended, a variation will be added under Section G that addresses having the MRS also serve the second repository, and that assumes that the second repository is in the East.

2. As recommended, the assumptions that a two-phase MRS will accept spent fuel three years earlier than the single-phase case and that the three-phase MRS will accept spent fuel one year earlier that the two-phase case should be confirmed during Task B.

3. The focus of the facility design studies is on the evaluation of the alternative facility configurations and system scenarios described in section I of the Task A report, including sensitivity studies. The impacts of the various logistics cases given in sections II and III of the Task A report upon facility designs are expected to be second-order effects. As time permits, and where appropriate, these effects can be addressed within the scope of Tasks B-E. Subsets of the cases can be selected where appropriate to do bounding analyses.

4. As recommended, the spent fuel projection basis is the "No New Orders" case.

5. As recommended, one-, two-, and three-phased construction in the no-MRS option will be included as sensitivity cases in Section G.

6. Task G is assessing the impacts and costs to utilities of the various system scenarios.

7. Pool storage at an MRS will be examined in Task C.

8. The waste package design is dependent on the scenario assumptions on spent fuel packaging. Three different waste package configurations will be assumed, as noted in the attachment. These designs are the reference waste package design from chapter 7 of the SCP, a "hybrid" design that could be used for packaging intact fuel at the repository, and a third configuration suitable for those cases where the MRS ships canisters to the repository. These canister and container configurations should be confirmed in task E and C. These will be added to the task A assumptions.

9. The same proportion of HLW (relative to the total HLW inventory) will be assigned to the first repository as the proportion of spent fuel (relative to the total spent fuel inventory) assigned to the first repository.

10. In the cases in which the MRS consolidates, the non-fuel bearing components will be packaged in normal waste package containers, except if the MRS canisters spent fuel and the containers are applied at the repository, in which case the hardware waste is packaged in the same type of canisters used for PWR assemblies.

11. As recommended, the two assumptions will be added to Section F.

12. At-reactor overspill refers to at-reactor storage requirements that exceed currently estimated pool capacities, assuming full-core-reserve discharge capacity is maintained.

ATTACHMENT 2

MRS SYSTEMS STUDY

TASK A

SCENARIO DEVELOPMENT AND SYSTEM LOGISTICS

SCENARIOS AND LOGISTICS FOR MRS SYSTEMS STUDY

INTRODUCTION

A number of specific studies that are needed to reexamine the role of the MRS facility in the waste management system have been identified in the "Action Plan for Systems Studies to Support the MRS Commission", dated May 31, 1988. The first task identified in that plan is the development of system scenarios and logistics to be used as the basis for the other studies. This report presents the scenarios and logistics to be used.

I. FACILITY CONFIGURATIONS AND SYSTEM SCENARIOS

A number of different configurations can be assumed for both the MRS and the repository, as listed in Table 1. The facility design subtask shall evaluate each of the 4 MRS (not including the no-MRS case) and 4 repository configurations shown in Table 1. These facility configurations can be combined with several different assumptions on factors such as MRS treatment of HLW, MRS location, western strategy, and MRS phased development to create many system scenarios. The various assumptions to be considered are discussed below.

A. ALLOCATION OF SPENT FUEL PACKAGING FUNCTIONS

One of the key variables to be studied is the role of the MRS facility in the packaging of spent fuel. The facility configurations for the MRS and repository that are shown in Table 1 can be combined in a number of ways as shown in Table 2. These combinations of packaging functions are as follows (see section B below for the corresponding waste package assumptions):

1. There is no MRS facility and the repository provides all of the packaging of spent fuel. This "No-MRS-Case" shall be used as a point of comparison of all other options. The repository shall be assumed to consolidate and containerize the spent fuel (except for 5% which will be containerized intact).

2. Same as 1, except the repository is assumed to package fuel without consolidation.

3. The MRS facility provides storage capabilities only and the repository provides all of the packaging functions. The repository shall be assumed to consolidate and containerize the spent fuel as in 1 above.

4. Same as 3, except the repository is assumed to package fuel without consolidation.

5. The MRS facility provides storage capabilities and also consolidates and places the spent fuel into canisters. The repository shall then place the canisters into containers.

TABLE 1

FACILITY CONFIGURATIONS

A. MRS

1	NO MRS
2	STORAGE-ONLY MRS
3	CONSOLIDATE & CANISTER
4	CONTAINERIZE INTACT
5	CONSOLIDATE & CONTAINERIZE

B. REPOSITORY

1	CONTAINERIZE INTACT
2	CONSOLIDATE & CONTAINERIZE
3 *	CHECK CONTAINERS
4 *	CHECK & REPAIR CONTAINERS

*For the marked repository facility configurations, sensitivity analyses will be conducted to determine the effects of adding packaging capability for small amounts (approx. 200 MTU) of HLW.

TABLE 2

FEASIBLE COMBINATIONS OF SPENT FUEL PACKAGING FUNCTIONS

	MRS PACKAGING FUNCTIONS	REPOSITORY PACKAGING FUNCTIONS
1	NONE (NO MRS)	CONSOLIDATE & CONTAINERIZE
2	NONE (NO MRS)	CONTAINERIZE INTACT
3	NONE (STORE ONLY)	CONSOLIDATE & CONTAINERIZE
4	NONE (STORE ONLY)	CONTAINERIZE INTACT
5	CONSOLIDATE & CANISTER	CONTAINERIZE
6	CONTAINERIZE INTACT	CHECK CONTAINERS
7	CONTAINERIZE INTACT	CHECK & REPAIR CONTAINERS
8	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS
9	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR CONTAINERS

6. The MRS facility does not consolidate, but packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are returned to the MRS for repair.

7. The MRS facility does not consolidate, but packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are repaired at the repository.

8. The MRS facility consolidates and packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are returned to the MRS for repair.

9. The MRS facility consolidates and packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are repaired at the repository.

B. ASSUMPTIONS ON MRS AND REPOSITORY PACKAGING

The waste package assumptions to be used are dependent on the assumed allocation of spent fuel packaging functions as described above. Table 3 provides a listing of the assumptions to be used on the configuration of the repository disposal containers and the product to be produced by the MRS. These configurations are shown in Figures 1-4. (These assumptions should be confirmed in tasks E and C.)

C. MRS TREATMENT OF DHLW AND WVHLW

Another key variable is the role to be played by the MRS facility in the packaging of defense high-level-waste (DHLW) and West Valley high-level-waste (WVHLW). . The following cases shall be studied:

1. All DHLW and WVHLW which is to be accepted by the system is sent directly to the repository. This shall be considered the base case for comparison. It is the only option in cases where the MRS does not containerize spent fuel (no-MRS, MRS storage-only, or MRS canistering with repository containerizing), as it is then assumed that DHLW and WVHLW would remain at their locations until the repository is available to containerize the HLW canisters.

2. All DHLW and WVHLW is sent to the MRS facility where it is placed into tuff-specific containers and later shipped to the repository. This case shall not be considered when the MRS does not containerize spent fuel.

3. DHLW and WVHLW are sent to the repository for containerization, unless the MRS facility is substantially nearer to their locations and has containerization capability.

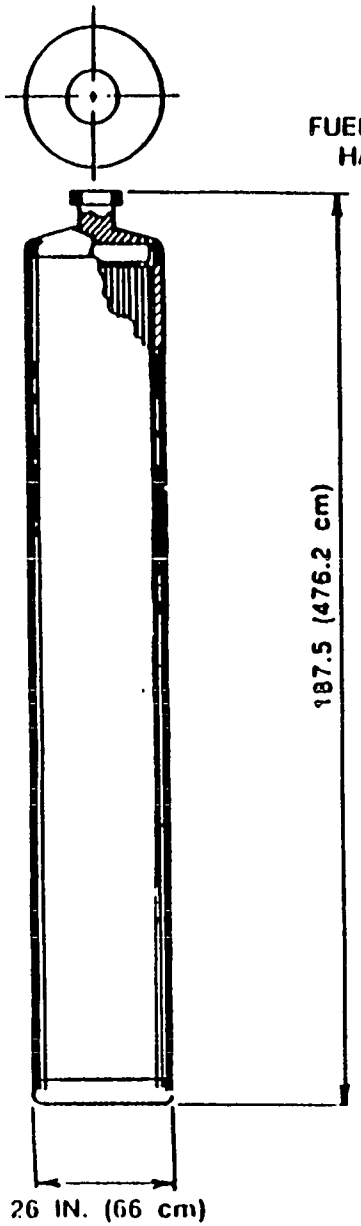
TABLE 3

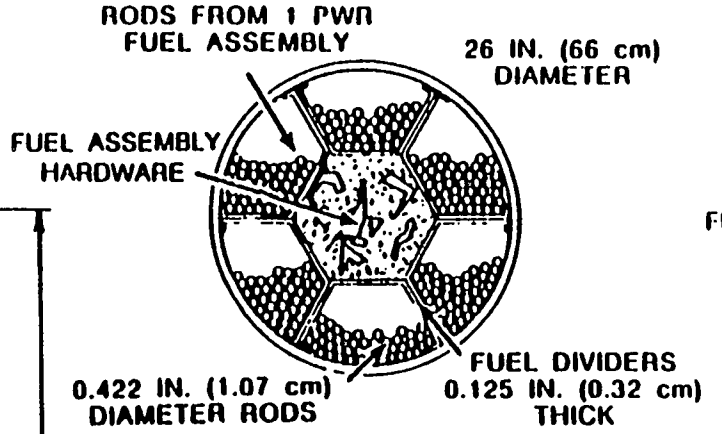
TABULATION OF MRS STUDY CASES WITH CANISTER/CONTAINER DESIGNS

NO.	MRS PACKAGING FUNCTIONS	MRS PRODUCT	REPOSITORY PACKAGING FUNCTIONS	REPOSITORY DISPOSAL CONTAINER
1	NONE (NO MRS)	NONE	CONSOLIDATE & CONTAINERIZE	FIGURES 1A, 1B, 1C, 1D
2	NONE (NO MRS)	NONE	CONTAINERIZE INTACT (3)	FIGURES 2A, 2B, 2C
3	NONE (STORE ONLY) (1)	BARE FUEL ASSEMBLIES	CONSOLIDATE & CONTAINERIZE	FIGURES 1A, 1B, 1C, 1D
4	NONE (STORE ONLY) (1)	BARE FUEL ASSEMBLIES	CONTAINERIZE INTACT (2), (3)	FIGURES 2A, 2B, 2C
5	CONSOLIDATE & CANISTER (7)	FIGURES 4A, 4B	CONTAINERIZE	FIGURES 3A, 3B
6	CONTAINERIZE INTACT (3)	FIGURES 2A, 2B, 2C	CHECK CONTAINERS (3)	FIGURES 2A, 2B, 2C
7	CONTAINERIZE INTACT (3)	FIGURES 2A, 2B, 2C	CHECK & REPAIR CONTAINERS (3), (6)	FIGURES 2A, 2B, 2C
8	CONSOLIDATE & CONTAINERIZE (4)	FIGURES 1A, 1B, 1C, 1D	CHECK CONTAINERS	FIGURES 1A, 1B, 1C, 1D
9	CONSOLIDATE & CONTAINERIZE (4)	FIGURES 1A, 1B, 1C, 1D	CHECK & REPAIR CONTAINERS (6)	FIGURES 1A, 1B, 1C, 1D

NOTES:
(1) IF CANISTERS ARE NECESSARY FOR MRS STORAGE PHASES, FIGURES 4A AND 4B APPLY.
(2) IF MRS CANISTERS ARE EMPLOYED, REPOSITORY DISPOSAL CONTAINER FIGURES 3A, 3B APPLY.
(3) FIGURE 2A IS THE PREFERRED CONFIGURATION WHEN THE SUPPLY OF PWR'S, BWR'S ALLOW. FIGURE 2C DEPICTS CONFIGURATION WITH FAILED FUEL IN PREPACKED AT-REACTOR CANISTERS.
(4) FUEL ASSEMBLY HARDWARE PLACED IN CENTRAL VOID AS SHOWN IN FIGURES 1A, 1B.
(5) FOR ALL REPOSITORY DISPOSAL CONTAINER CONFIGURATIONS A MAXIMUM PACKAGE HEAT LOADING AT THE TIME OF EMPLACEMENT OF 3,500 W IS ASSUMED.
(6) AT REPOSITORY CONTAINER REPAIR FUNCTION TO BE BASED ON REMEDIAL WELD REPAIR SUFFICIENT TO ALLOW TRANSPORTATION RETURN BACK TO THE MRS FOR RE-WORK.
(7) FUEL ASSEMBLY HARDWARE PLACED IN FIGURE 4A CANISTERS

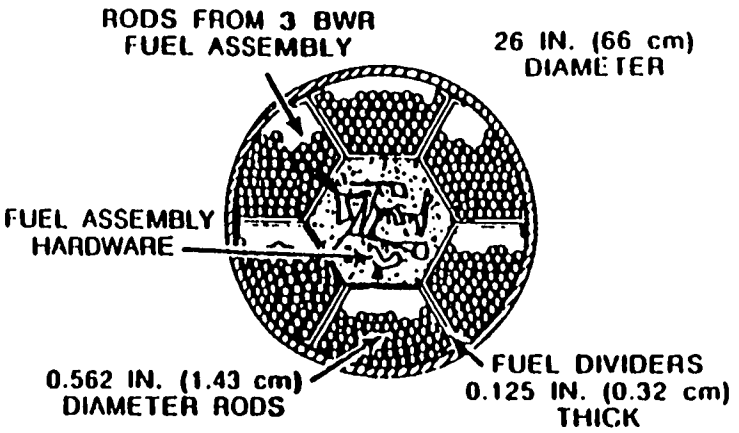
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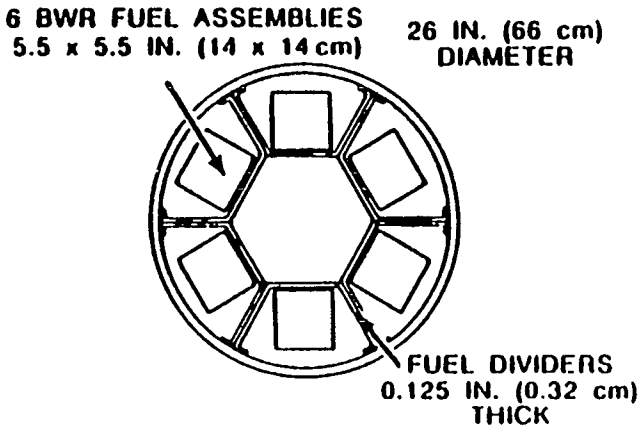
CONFIGURATION 1.
SIX CONSOLIDATED PWR ASSEMBLIES

FIGURE 1A

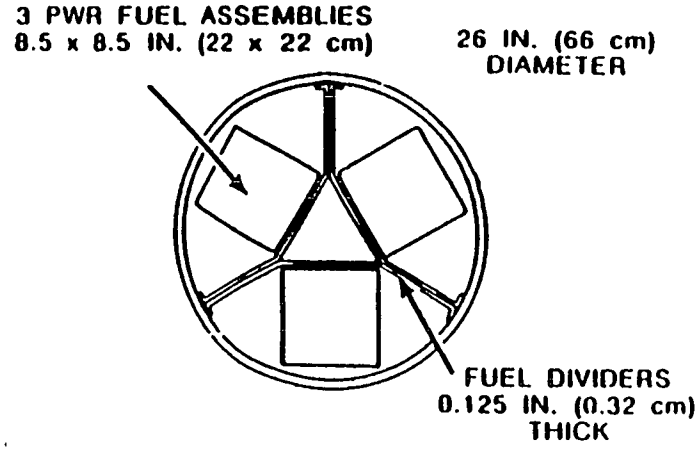


CONFIGURATION 2.
EIGHTEEN CONSOLIDATED BWR ASSEMBLIES

FIGURE 1B



CONFIGURATION 3.
SIX INTACT BWR ASSEMBLIES



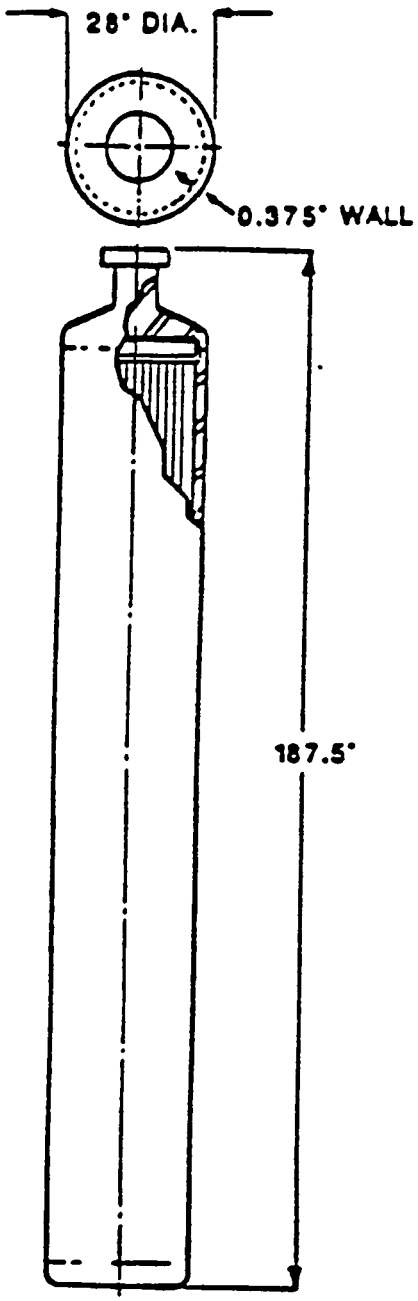
CONFIGURATION 4.
THREE INTACT PWR ASSEMBLIES

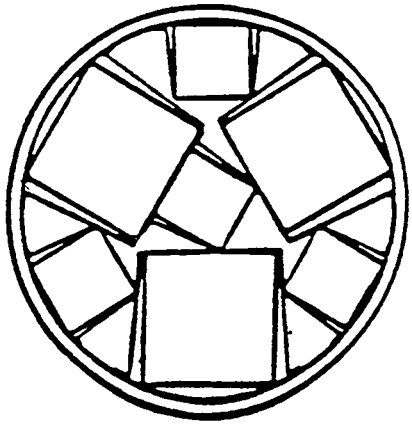
PWR - PRESSURIZED WATER REACTION
BWR - BOILING WATER REACTOR

FIGURE 1C

FIGURE 1D

FIGURE 1
REPOSITORY REFERENCE DESIGN CONTAINERS

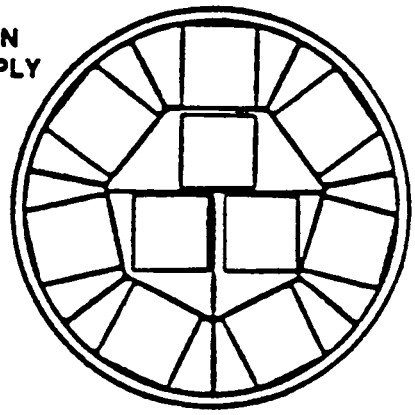




3 PWRS + 4 BWRS
(LOADED WEIGHT-9,800 lb)

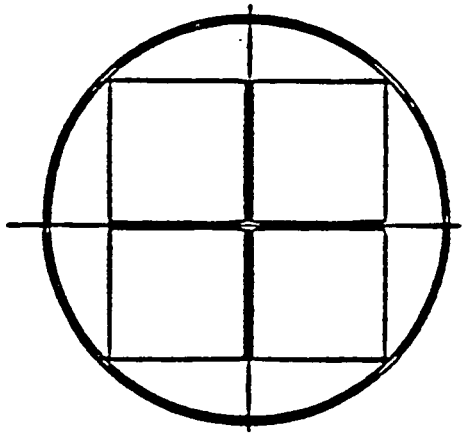
FIGURE 2A

NOTE:
PREFERRED CONFIGURATION WHEN THE SUPPLY OF PWR'S AND BWR'S ALLOW.



10 BWRS
(LOADED WEIGHT-9,500 lb)

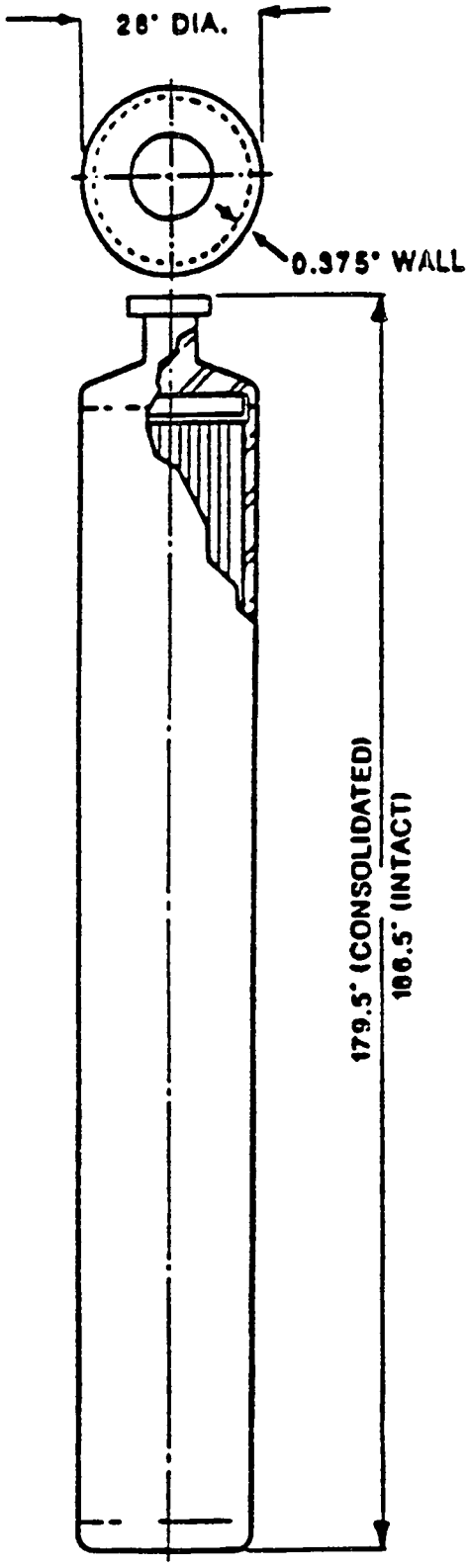
FIGURE 2B



4 PWRS
(LOADED WEIGHT-8,500 lb)

FIGURE 2C

FIGURE 2
INTACT FUEL CONFIGURATIONS



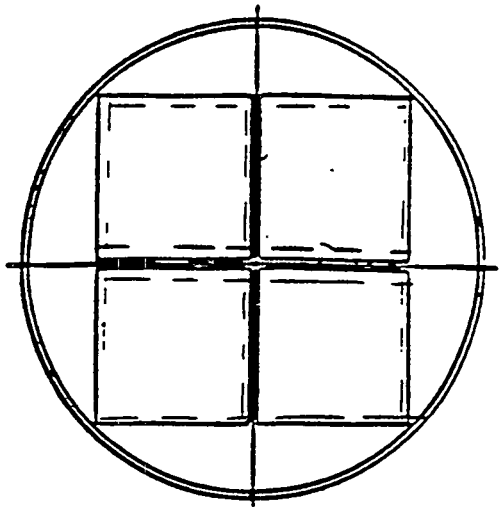


FIGURE 3A

4 INTACT PWRS
(LOADED WEIGHT-10,350 lb.)
OR
6 CONS. PWRS (POWER LIMITED)
(LOADED WEIGHT-12,300 lb.)
OR.
20 CONS. BWRS
(LOADED WEIGHT-16,900 lb.)

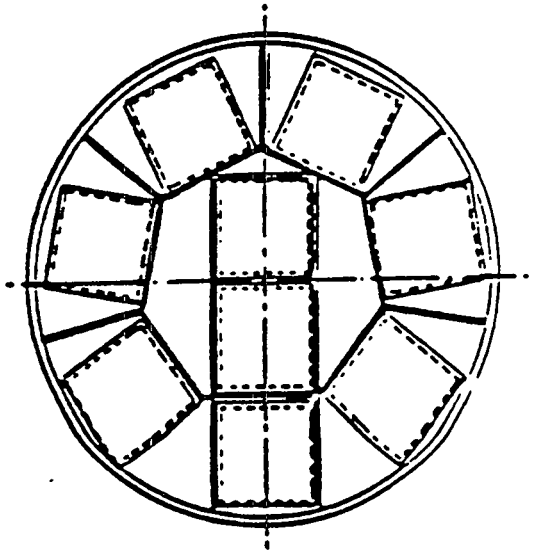


FIGURE 3B

8 INTACT BWRS
(LOADED WEIGHT-11,650 lb.)

FIGURE 3
CANISTERED FUEL CONFIGURATIONS

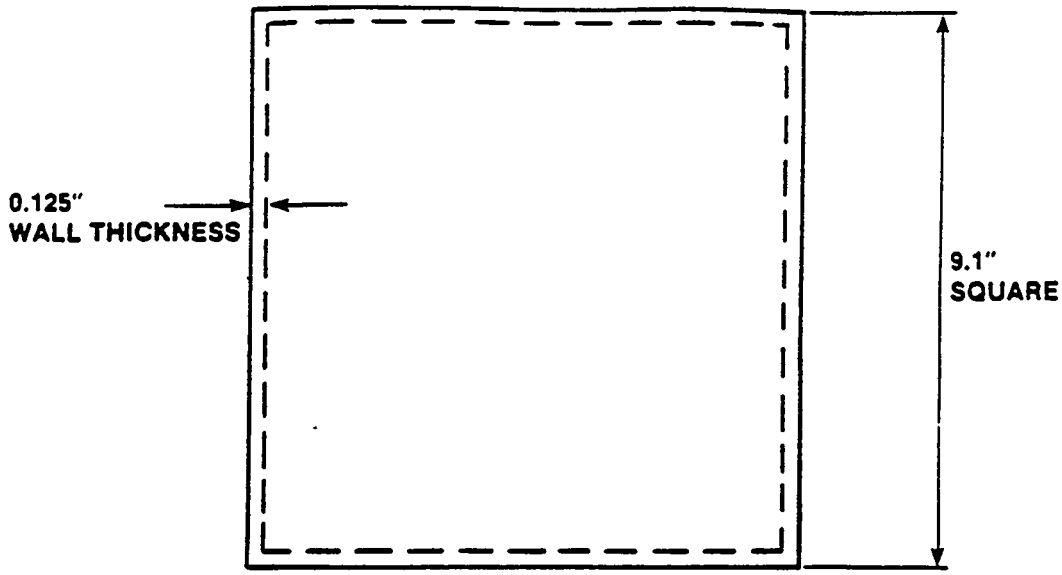


FIGURE 4A - PWR - INTACT & CONSOLIDATED, AND
BWR - CONSOLIDATED

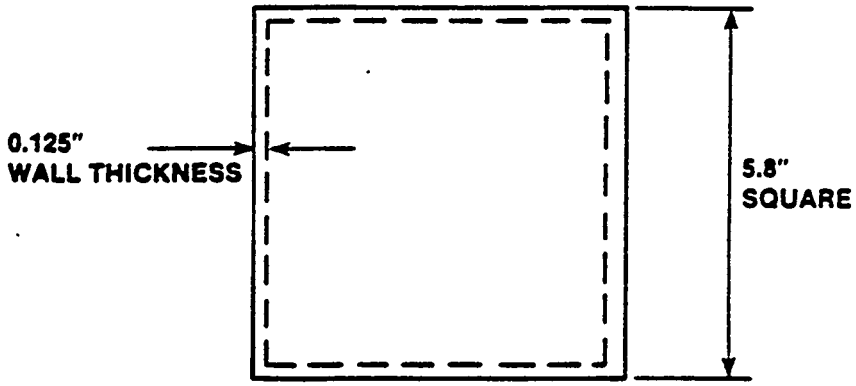


FIGURE 4B - BWR INTACT

FIGURE 4
MRS CANISTERS

D. MRS LOCATION

Two cases of MRS facility location shall be considered, as follows:

1. A generic eastern site. A site centrally located with respect to eastern reactors shall be assumed.

2. A generic western site. An arbitrary western location shall be assumed.

(100 degrees longitude shall be used as the dividing line between east and west.)

E. WESTERN STRATEGY WITH EASTERN MRS

In cases where the MRS facility is assumed to be in the east, there is the consideration of whether western fuel should go to the MRS facility. In the case of a western MRS facility, it is assumed that all spent fuel could be shipped to the MRS as there would be no major transportation penalties involved. For an eastern MRS facility, the following cases shall be considered:

1. All spent fuel goes directly to the MRS facility.

2. Western fuel (that originating at reactors west of 100 degrees longitude) is shipped directly to the repository, if it is available, and all eastern fuel is shipped to the MRS facility. In cases where the MRS facility is in operation prior to the repository and western fuel is due to be accepted, that western fuel is assumed to be shipped to the MRS facility.

F. MRS PHASING

Three cases shall be considered for the phasing of deployment of MRS facility capabilities, as follows:

1. The MRS facility shall be developed as a single-phase facility with receiving, handling, storage and packaging (the scope of which is defined by the particular scenario under consideration) functions beginning operations at the same time.

2. The MRS facility shall be developed as a two-phase facility with receiving, handling, and storage beginning before packaging capability is ready for operations. It shall be assumed that the initial storage would be in MRS storage casks, but with the fuel in the form in which it was received (i.e., intact fuel assemblies) merely transferred from the transportation casks into the storage casks.

3. The MRS facility shall be developed as a three-phase facility. This is an extension of the two-phase concept described above, with the addition of an earlier phase consisting of the storage of dual-purpose (transport and storage) casks on

paid. The dual-purpose casks would arrive loaded for reactors and could be utility-supplied or DOE-supplied.

G. OTHER ASSUMPTIONS

The following are additional key assumptions about the system:

1. The first repository is assumed to be at Yucca Mountain, Nevada.

2. The MRS is assumed to serve only the first repository.

3. The spent fuel projection is based on the 1987 reactor-specific data base corresponding to the 1987 EIA no-new-orders case.

4. Total DHLW quantity is 17,470 canisters equal to .5 MTU each. The DHLW canisters to be produced at DWPF at Savannah River shall be taken to be the standard configuration for all DHLW. WVHLW is assumed to be in 300 canisters from 640 MTU of reprocessed spent fuel.

5. The Yucca repository is assumed to be limited to 70,000 MTU capacity. DHLW and WVHLW will be assigned to the first repository in the same proportion as the proportion of spent fuel assigned to the first repository.

6. All spent fuel will be assumed to be shipped from the reactors intact. In consolidation cases, 5% of the spent fuel will not be consolidated by the MRS or the repository.

7. Consistent with the results contained in "Additional Information on Monitored Retrievable Storage" (DOE/RW-0166), it is assumed that no packaging functions will be performed at the reactor sites.

8. Spent fuel will be shipped from reactors on an oldest-fuel-first basis, modified as needed to ensure full cask loads.

9. From-MRS dedicated trains are assumed to consist of 5 cars. In the cases where the MRS consolidates, the hardware waste will be assumed to be packaged with the spent fuel in waste containers (cases 8 and 9 in Table 3) or in the same canisters used for PWR assemblies (case 5 in Table 3).

10. A consolidation ratio of 2:1 shall be assumed.

B. SENSITIVITY ANALYSES

The following variations to the above assumptions shall be considered in sensitivity analyses:

1. For the scenarios where the MRS facility is assumed to containerize the spent fuel, and HLW is assumed to be shipped to either the repository or the MRS (whichever is nearer), sensitivity analyses will be conducted to determine the effects of adding packaging capabilities to the repository for small amounts (approximately 200 MTU/year) of HLW.

2. Sensitivity analyses will be conducted to determine the effects of accepting various amounts of at-reactor consolidated fuel (including spent fuel hardware) into the system. These analyses will assume 25%, 50%, and 100% of additional at-reactor storage requirements (beyond currently estimated pool capacities) is consolidated at the reactor sites. Similar analyses will also be conducted for the same percentages of additional at-reactor storage requirements, assuming dry storage into canisters that are similar to the NUHOMS dry spent fuel storage canister.

3. A sensitivity case will be included to address having the MRS serving a second repository, with the repository located in the east.

4. Sensitivity analyses will be conducted of the possibility of one-, two-, and three-phased construction of the repository in the no-MRS scenarios.

5. Sensitivity cases will be included for cases which assume the facility ramp-up rates are as given in the Draft 1988 Mission Plan Amendment.

II. SYSTEM LOGISTICS

Table 4 lists the different combinations of facility start dates and MRS phasing assumptions to be considered.

Cases 1-7 assume a repository start date of 2003, cases 8-16 assume a repository delayed until 2008, and cases 17-25 assume a repository delayed until 2013. For each set, cases are included for no MRS, a one-phase MRS, a two-phase MRS, and a three-phase MRS. Cases 5-7, 12-16, and 21-25 are unconstrained cases, meaning that the constraints on MRS deployment set by the NWPAA are relaxed by siting and developing the MRS through the NWPAA-Negotiator process (e.g., MRS operations are not tied to repository construction authorization and, in some of these cases, MRS inventory may go above 15,000 MTU and might exceed 10,000 MTU before the repository is operational). Cases 14, 16, 23, and 25 are identical to the cases immediately preceding them, except that the MRS facility is delayed an additional 5 years.

The two-phase MRS is assumed to permit spent fuel acceptance three years earlier than the corresponding single-phase case. The three-phase MRS is assumed to start acceptance one year earlier than the two-phase case. (These schedule assumptions should be confirmed during task B.)

The attached waste acceptance schedules are based on the 25 start-date combinations shown in Table 4. Waste acceptance schedules 1-25 correspond to the 25 start-date combinations and assume that all HLW is shipped directly to the repository and that a western strategy is used for spent fuel shipments. Waste-acceptance schedules 26-47 are similar to schedules 1-25 except that no western strategy is assumed (i.e., all spent fuel goes to the MRS) and the no MRS cases are not repeated. Waste acceptance schedules 48-69 assume a western fuel strategy, but assume that all HLW goes to the MRS. Schedules 70-91 assume no western strategy and assume that all HLW goes to the MRS. Note that only some of these schedules are applicable to each of the system scenarios described above.

The attached waste acceptance schedules are based on the 25 start-date combinations shown in Table 4. Waste acceptance schedules 1-25 correspond to the 25 start-date combinations and assume that all HLW is shipped directly to the repository and that a western strategy is used for spent fuel shipments. Waste acceptance schedules 26-47 are similar to schedules 1-25 except that no western strategy is assumed (i.e., all spent fuel goes to the MRS) and the no MRS cases are not repeated. Waste acceptance schedules 48-69 assume a western fuel strategy, but assume that all HLW goes to the MRS. Schedules 70-91 assume no western strategy and assume that all HLW goes to the MRS. Note that only some of these schedules are applicable to each of the system scenarios described above.

Table 4

FACILITY START DATES

	Repository CA	MRS Phases	MRS Dates	Repository Oper.
1.	1998	0	no MRS	2003
2.	1998	one	2003 operations	2003
3.	1998	two	2000 storage, 2003 packaging*	2003
4.	1998	three	1999 initial storage, 2000 full storage, 2003 packaging**	2003
5.	1998***	one	2000	2003
6.	1998***	two	1997, 2000	2003
7.	1998***	three	1996, 1997, 2000	2003
8.	2003	0	no MRS	2008
9.	2003	one	2008 operations	2008
10.	2003	two	2005, 2008	2008
11.	2003	three	2004, 2005, 2008	2008
12.	2003***	one	2000	2008
13.	2003***	two	1997, 2000	2008
14.	2003***	two	2002, 2005	2008
15.	2003***	three	1996, 1997, 2000	2008
16.	2003***	three	2001, 2002, 2005	2008
17.	2008	0	no MRS	2013
18.	2008	one	2013 operations	2013
19.	2008	two	2010, 2013	2013
20.	2008	three	2009, 2010, 2013	2013
21.	2008***	one	2000	2013
22.	2008***	two	1997, 2000	2013
23.	2008***	two	2002, 2005	2013
24.	2008***	three	1996, 1997, 2000	2013
25.	2008***	three	2001, 2002, 2005	2013

*: In the two phase cases, initial storage would be in the same form as received, but transferred to MRS storage casks from transportation casks. Packaging refers to start of full MRS facility packaging capability in phase two.

**: In the three phase cases initial storage would be in (dual purpose) transportable storage casks on pads, full storage would be the start of use of MRS storage casks, and the third phase would begin with the start of full MRS facility packaging capability.

***: These cases are those to be considered without the NWPAA constraint requiring repository construction authorization prior to MRS construction. Other NWPAA constraints on MRS capacity are also relaxed in these cases.

III. TRANSPORTATION CASES TO BE STUDIED

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The various schedules described above and the various system scenarios described earlier can be combined to produce a lengthy list of transportation cases to be studied, as shown in Table 5. As noted in Table 5, this list of feasible combinations, which would need to be examined for transportation impacts, would involve 1216 different combinations. Rather than attempting to analyze all of these cases, a preliminary evaluation was made to eliminate many of them from further consideration.

First, it would appear that the cases with the repository checking and repairing containers shipped from the MRS would not be substantially different from those cases with the repository merely checking containers. This could be expected since the MRS facility would likely be producing only a few defective containers and because the return of defective containers for repair at the MRS could be done in the otherwise empty casks returning to the MRS with minimal transportation impacts. Hence, the repository check and repair cases will be analyzed and the repository check-only cases will not.

Also, Table 5 contains three options for HLW destinations-the MRS, the repository, or whichever is nearer to the HLW locations. It would appear that in terms of facility impacts, the to-repository or to-MRS cases would bound the effects of the "nearer" cases. This would also appear to be true in terms of transportation impacts. Further, facility-specific schedules for HLW shipments and the relative priorities for their shipments are not readily available. Hence, the "nearer" cases will not be examined in detail, but will be considered as sensitivity cases.

By eliminating the cases described above, Table 5 can be reduced to Table 6, which has 468 cases to be examined for transportation impacts.

Subsequent tasks in the MRS System Study shall review the list of cases shown in Table 6, as well as the other study assumptions listed above, and shall recommend deletions and revisions to this document, as appropriate, to the Integration Branch for coordination across tasks.

TABLE 5
POTENTIAL SCENARIO AND SCHEDULE COMBINATIONS
INITIALLY CONSIDERED FOR MRS STUDY

#	MRS PACKAGING FUNCTIONS	REPOSITORY PACKAGING FUNCTIONS	MLW DESTINATION	MRS LOCATION	WESTERN STRATEGY	APPLICABLE SCHEDULE CASES	NUMBER OF SCENARIO/SCHEDULE COMBINATIONS
1	NONE (NO MRS)	CONTAINERIZE INTACT	REPOSITORY	N/A	N/A	1,8,17	3
2	NONE (NO MRS)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	N/A	N/A	1,8,17	3
3	NONE (STORE ONLY)	CONTAINERIZE INTACT	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
4	NONE (STORE ONLY)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
5	NONE (STORE ONLY)	CONTAINERIZE INTACT	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
6	NONE (STORE ONLY)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
7	NONE (STORE ONLY)	CONTAINERIZE INTACT	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
8	NONE (STORE ONLY)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
9	CONSOLIDATE & CANISTER	CONTAINERIZE INTACT	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
10	CONSOLIDATE & CANISTER	CONTAINERIZE INTACT	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
11	CONSOLIDATE & CANISTER	CONTAINERIZE INTACT	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
12	CONTAINERIZE INTACT	CHECK CONTAINERS	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
13	CONTAINERIZE INTACT	CHECK CONTAINERS	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
14	CONTAINERIZE INTACT	CHECK CONTAINERS	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
15	CONTAINERIZE INTACT	CHECK CONTAINERS	MRS	EASTERN	ALL SF TO MRS	70-91	22
16	CONTAINERIZE INTACT	CHECK CONTAINERS	MRS	EASTERN	MOST W. TO REP.	48-69	22
17	CONTAINERIZE INTACT	CHECK CONTAINERS	MRS	WESTERN	ALL SF TO MRS	70-91	22
18	CONTAINERIZE INTACT	CHECK CONTAINERS	NEARER	EASTERN	ALL SF TO MRS	26-47,70-91	44
19	CONTAINERIZE INTACT	CHECK CONTAINERS	NEARER	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
20	CONTAINERIZE INTACT	CHECK CONTAINERS	NEARER	WESTERN	ALL SF TO MRS	26-47,70-91	44
21	CONTAINERIZE INTACT	CHECK & REPAIR	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
22	CONTAINERIZE INTACT	CHECK & REPAIR	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
23	CONTAINERIZE INTACT	CHECK & REPAIR	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
24	CONTAINERIZE INTACT	CHECK & REPAIR	MRS	EASTERN	ALL SF TO MRS	70-91	22
25	CONTAINERIZE INTACT	CHECK & REPAIR	MRS	EASTERN	MOST W. TO REP.	48-69	22
26	CONTAINERIZE INTACT	CHECK & REPAIR	MRS	WESTERN	ALL SF TO MRS	70-91	22
27	CONTAINERIZE INTACT	CHECK & REPAIR	NEARER	EASTERN	ALL SF TO MRS	26-47,70-91	44
28	CONTAINERIZE INTACT	CHECK & REPAIR	NEARER	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
29	CONTAINERIZE INTACT	CHECK & REPAIR	NEARER	WESTERN	ALL SF TO MRS	26-47,70-91	44
30	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
31	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
32	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
33	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	MRS	EASTERN	ALL SF TO MRS	70-91	22
34	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	MRS	EASTERN	MOST W. TO REP.	48-69	22
35	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	MRS	WESTERN	ALL SF TO MRS	70-91	22
36	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	NEARER	EASTERN	ALL SF TO MRS	26-47,70-91	44
37	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	NEARER	EASTERN	MOST W. TO REP.	2-7,9-16,18-25,48-6	44
38	CONSOLIDATE & CONTAINERIZE	CHECK CONTAINERS	NEARER	WESTERN	ALL SF TO MRS	26-47,70-91	44
39	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
40	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
41	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
42	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	MRS	EASTERN	ALL SF TO MRS	70-91	22
43	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	MRS	EASTERN	MOST W. TO REP.	48-69	22
44	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	MRS	WESTERN	ALL SF TO MRS	70-91	22
45	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	NEARER	EASTERN	ALL SF TO MRS	26-47,70-91	44
46	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	NEARER	EASTERN	MOST W. TO REP.	2-7,9-16,18-25,48-6	44
47	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	NEARER	WESTERN	ALL SF TO MRS	26-47,70-91	44
							1216

TABLE 6

SCENARIO AND SCHEDULE COMBINATIONS TO BE USED IN TRANSPORTATION EVALUATIONS FOR MRS STUDY

#	MRS PACKAGING FUNCTIONS	REPOSITORY PACKAGING FUNCTIONS	MLW DESTINATION	MRS LOCATION	WESTERN STRATEGY	APPLICABLE SCHEDULE CASES	NUMBER OF SCENARIO/SCHEDULE COMBINATIONS
1	NONE (NO MRS)	CONTAINERIZE INTACT	REPOSITORY	N/A	N/A	1,8,17	3
2	NONE (NO MRS)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	N/A	N/A	1,8,17	3
3	NONE (STORE ONLY)	CONTAINERIZE INTACT	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
4	NONE (STORE ONLY)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
5	NONE (STORE ONLY)	CONTAINERIZE INTACT	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
6	NONE (STORE ONLY)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
7	NONE (STORE ONLY)	CONTAINERIZE INTACT	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
8	NONE (STORE ONLY)	CONSOLIDATE & CONTAINERIZE	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
9	CONSOLIDATE & CANISTER	CONTAINERIZE INTACT	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
10	CONSOLIDATE & CANISTER	CONTAINERIZE INTACT	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
11	CONSOLIDATE & CANISTER	CONTAINERIZE INTACT	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
12	CONTAINERIZE INTACT	CHECK & REPAIR	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
13	CONTAINERIZE INTACT	CHECK & REPAIR	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
14	CONTAINERIZE INTACT	CHECK & REPAIR	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
15	CONTAINERIZE INTACT	CHECK & REPAIR	MRS	EASTERN	ALL SF TO MRS	70-91	22
16	CONTAINERIZE INTACT	CHECK & REPAIR	MRS	EASTERN	MOST W. TO REP.	48-69	22
17	CONTAINERIZE INTACT	CHECK & REPAIR	MRS	WESTERN	ALL SF TO MRS	70-91	22
18	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	REPOSITORY	EASTERN	ALL SF TO MRS	26-47	22
19	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	REPOSITORY	EASTERN	MOST W. TO REP.	2-7,9-16,18-25	22
20	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	REPOSITORY	WESTERN	ALL SF TO MRS	26-47	22
21	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	MRS	EASTERN	ALL SF TO MRS	70-91	22
22	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	MRS	EASTERN	MOST W. TO REP.	48-69	22
23	CONSOLIDATE & CONTAINERIZE	CHECK & REPAIR	MRS	WESTERN	ALL SF TO MRS	70-91	22
							468

DOE F (325.8 (12-84)

United States Government **Department of Energy**

memorandum

05073

NN1.880822.0016

DATE: AUG 19 1988

REPLY TO ATTN OF: RW-321

SUBJECT: MRS Systems Study/Task A Clarification

TO: J. Hale, RW-222
C. Kouts, RW-323

The purpose of this memo is to provide additional information to be used in the MRS Systems Study and to clarify Task A assumptions in response to discussions held with study participants since the issuance of the completed Task A package on August 2nd.

The attached "Additional Information for MRS Systems Studies" provides some minor revisions and clarifications to the Task A package in response to discussions held during the Task B-E meeting at WMPO on August 3rd and 4th and in subsequent discussions with the meeting participants. The transportation assumptions included in the attached are in response to requests for this additional information made during the meeting and are based on information provided by the transportation program. Additional transportation cask assumptions can be developed if needed.

Please provide the attached information to the appropriate participants in the system studies under your responsibility. If you have any questions or comments on the attached, please contact me. Thank you for your continued cooperation in this important effort.

William J. Danker, Acting Chief
Integration Branch
Office of Civilian Radioactive
Waste Management

Attachment

ACTION
CC: GERTZ
CC: WILMOT
CC: EKOSIEN
CC: RODRIGUEZ
CC: BACA
CC: CLONINGER

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cc: R. Stein
S. Kale
S. Rousso
T. Isaacs
N. Moon
L. Desell
K. Klein
W. Danker
T. Wood, PNL
M. Conroy, Weston
P. Bolton, Weston

ADDITIONAL INFORMATION FOR MRS SYSTEMS STUDIES

1. The following are clarifications to the cases where the repository is checking or checking and repairing containers produced by the MRS (refer to Task A, Table 2 for a listing of the cases) :

a) In case 6: The MRS facility does not consolidate, but packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are returned to the MRS for repair or replacement. It is assumed that less than 1% of the containers would be defective.

b) In case 7: The MRS facility does not consolidate, but packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are repaired or replaced, as needed, to prepare disposal-ready packages at the repository. It is assumed that less than 1% of the containers would be defective.

c) In case 8: The MRS facility consolidates and packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are returned to the MRS for repair or replacement. It is assumed that less than 1% of the containers would be defective.

d) In case 9: The MRS facility consolidates and packages the fuel into tuff-specific containers. At the repository the containers are inspected and if any are found defective, they are repaired or replaced, as needed, to prepare disposal-ready packages at the repository. It is assumed that less than 1% of the containers would be defective.

These functions are summarized in the attached revision of Table 3 from the Task A assumptions.

2. In case 5, where the MRS consolidates and canisters, fuel assembly hardware wastes are assumed to be compacted and placed into 55 gallon drums. (This is reflected in footnote 8 of the attached revised Table 3.) These drums would then be bound together in stacks of 5 by a cage or frame. These "canisters" of five drums would then be shipped to the repository for disposal. No other HLW forms are expected to be generated at the MRS.

3. For the store-only MRS there is no difference in functions between phase 1 and phase 2 in the two-phase case or between phases 2 and 3 in the three-phase case. In the store-only MRS, when the MRS is operating in a flow-through mode (i.e., there is no need to hold the fuel in storage at the MRS), the MRS shall be assumed to transfer spent fuel from truck casks into rail casks, but will not remove spent fuel from the rail casks which it receives. The contents of the truck casks will be loaded into 150 ton rail casks with a capacity of 28 PWR assemblies or 61 BWR assemblies.

TABLE 3

TABULATION OF MRS STUDY CASES WITH CANISTER/CONTAINER DESIGNS

No.	MRS PACKAGING FUNCTIONS	MRS PRODUCT	REPOSITORY PACKAGING FUNCTIONS	REPOSITORY DISPOSAL CONTAINER (5)
1	NONE (NO MRS)	NONE	CONSOLIDATE & CONTAINERIZE	FIGURES 1A, 1B, 1C, 1D
2	NONE (NO MRS)	NONE	CONTAINERIZE INTACT (3)	FIGURES 2A, 2B, 2C
3	NONE (STORE ONLY) (1)	BARE FUEL ASSEMBLIES	CONSOLIDATE & CONTAINERIZE	FIGURES 1A, 1B, 1C, 1D
4	NONE (STORE ONLY) (1)	BARE FUEL ASSEMBLIES	CONTAINERIZE INTACT (2), (3)	FIGURES 2A, 2B, 2C
5	CONSOLIDATE & CANISTER (8)	FIGURES 4A, 4B	CONTAINERIZE	FIGURES 3A, 3B
6	CONTAINERIZE INTACT (3)	FIGURES 2A, 2B, 2C	CHECK CONTAINERS & RETURN DEFECTIVES (3), (6)	FIGURES 2A, 2B, 2C
7	CONTAINERIZE INTACT (3)	FIGURES 2A 2B, 2C	CHECK & REPAIR CONTAINERS (3), (7)	FIGURES 2A, 2B, 2C
8	CONSOLIDATE & CONTAINERIZE (4)	FIGURES 1A, 1B, 1C, 1D	CHECK CONTAINERS & RETURN DEFECTIVES (3), (6)	FIGURES 1A, 1B, 1C, 1D
9	CONSOLIDATE & CONTAINERIZE (4)	FIGURES 1A, 1B, 1C, 1D	CHECK & REPAIR CONTAINERS (7)	FIGURES 1A, 1B, 1C, 1D

NOTES:

(1) IF CANISTERS ARE NECESSARY FOR MRS STORAGE PHASES, FIGURES 4A AND 4B APPLY.
(2) IF MRS CANISTERS ARE EMPLOYED, REPOSITORY DISPOSAL CONTAINER FIGURES 3A, 3B APPLY.
(3) FIGURE 2A IS THE PREFERRED CONFIGURATION WHEN THE SUPPLY OF PWR'S, BWR'S ALLOW. FIGURE 2C DEPICTS CONFIGURATION WITH FAILED FUEL IN PREPACKED AT-REACTOR CANISTERS.
(4) FUEL ASSEMBLY HARDWARE PLACED IN CENTRAL VOID AS SHOWN IN FIGURES 1A, 1B.
(5) FOR ALL REPOSITORY DISPOSAL CONTAINER CONFIGURATIONS A MAXIMUM PACKAGE HEAT LOADING AT THE TIME OF EMPLACEMENT OF 3,500 W IS ASSUMED.
(6) REPOSITORY FUNCTIONS TO BE BASED ON INSPECTION ONLY AND RETURN OF DEFECTIVE CONTAINERS TO MRS FOR REPAIR/REPLACEMENT.
(7) REPOSITORY FUNCTIONS TO BE BASED ON THE CAPABILITY FOR FULL REPAIR OR REPLACEMENT OF DEFECTIVE CONTAINERS.
(8) FUEL ASSEMBLY HARDWARE PLACED IN 55 GALLON DRUMS.

4. Repository lag storage shall be assumed to be in accordance with the Generic Requirements document. The MRS facility in-building vault storage shall be based on the canyon footprint size of the reference design. (In the store-only MRS, the vault storage requirement does not apply.)

5. For the purposes of receiving facility design assumptions, the transportation modal split shall be assumed to be approximately 55% rail and 45% truck, by MTU weight.

6. A sensitivity analysis shall be done for the case of a store-only MRS (Task A, Table 2, cases 3 and 4) entering into a caretaker mode when the repository is fully operational with spent fuel shipments going directly to the repository.

7. In the sensitivity cases of a phased repository without an MRS (as called for in Task A, item H.4) it shall be assumed that a single-phase repository would consist of only one waste handling building. The two-phased repository would contain two waste handling buildings as per the SCP-CDR. The three-phased repository would be as per the SCP-CDR, but with the addition of an early storage capbility for transportable storage casks (750 MTU worth).

8. Transportation cask capacities shall be assumed to be as shown in the attached table.

9. In case 5, in which the MRS consolidates and canisters 95% of the fuel it handles, the BWR portion of the 5% not consolidated is to be placed into 6.0" square canisters as shown in the attached revised Figure 4.

TRANSPORTATION CASK ASSUMPTIONS

CASK TYPE	APPROX. LOADED WT. (TONS)	WASTE UNITS (see Task A Table 3)	CASK CAPACITY (ASSEMBLIES)
TRUCK	38	intact spent fuel	3 PWR or 7 BWR
SPENT FUEL RAIL	100	intact spent fuel	21 PWR or 48 BWR
HLW RAIL	100	HLW canisters	5 HLW canisters
TRANSPORTABLE STORAGE CASKS	135	intact spent fuel	24 PWR or 60 BWR
FROM-MRS RAIL (except for cases 3 & 4 where MRS will not unload/reload rail receipts)	150	Cases 3 & 4: Store-only MRS for spent fuel trucked to MRS:	28 PWR or 61 BWR
		Case 5: MRS consolidates and canisters	
		95% consolidated in Figure 4A:	56 PWR or 140 BWR
		5% intact in Figures 4A,4B:	28 PWR or 61 BWR
		Canistered, consolidated NFBC	4 Containers (with each containe holding five 55 gallon drums (7 assys./drum))
		Cases 6 and 7: MRS containerizes intact	4 Containers with:
		Figure 2A (ref.):	12 PWR AND 16 BWR
		Figures 2B,2C:	16 PWR or 40 BWR
		Cases 8 and 9: MRS consolidates & containerizes	4 Containers with:
		95% consolidated in Figure 1A,1B:	24 PWR or 72 BWR
		5% intact in Figure 1C,1D: (NFBC in central voids of 1A,1B)	12 PWR or 24 BWR

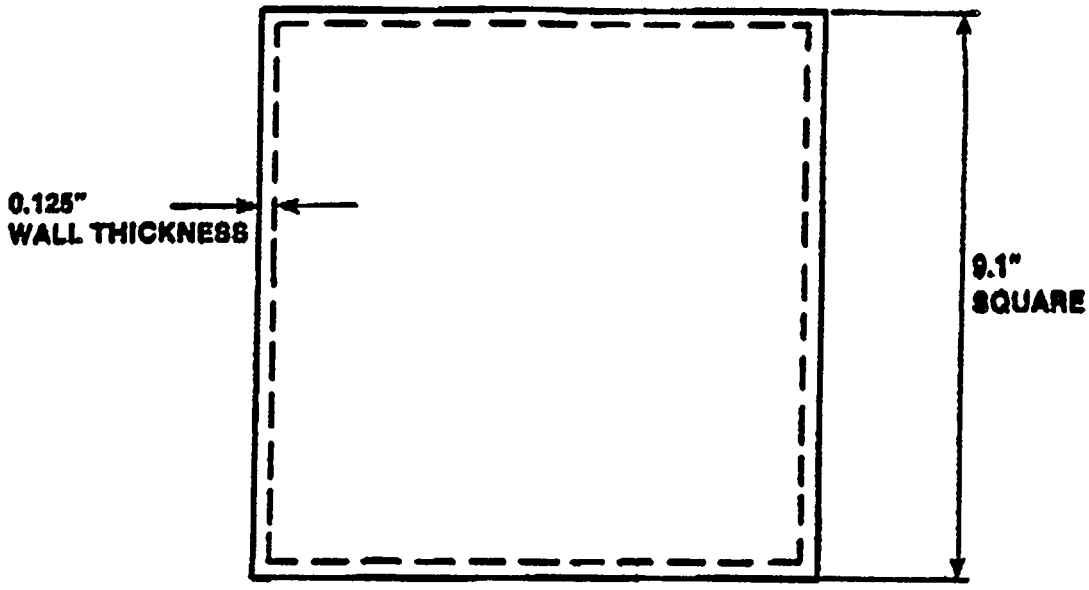


FIGURE 4A - PWR - INTACT & CONSOLIDATED, AND BWR - CONSOLIDATED

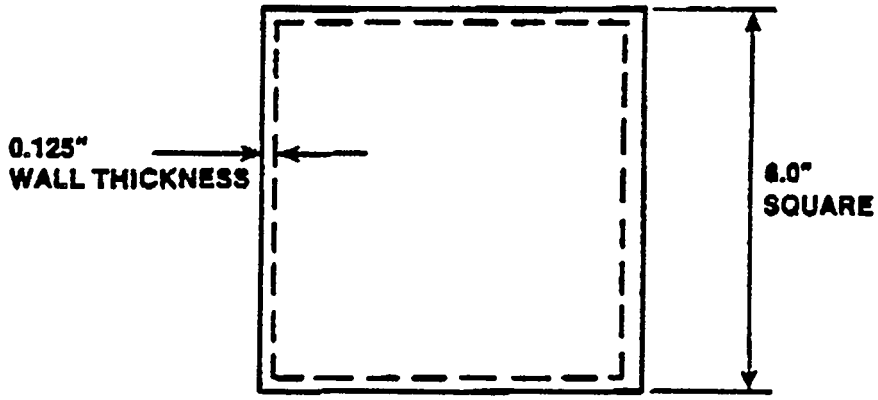


FIGURE 4B - BWR INTACT

FIGURE 4
MRS CANISTERS

05073

WESTON

955 L'ENFANT PLAZA, S.W.
8th FLOOR
WASHINGTON, D.C. 20024
PHONE: 202-646-6600
TELECOPY: 202-863-2220

TELECOPIER TRANSMITTAL REQUEST

Date Sent: AUGUST 23 '88

Total number of pages including cover sheet: 8

TO: Person/Title: ANTHONY SACA

Organization/Location: DOE - WMPO.

FROM: Person/Title: JOHN RICHARDSON

Organization/Location: WESTON — DC.

TIME: Started/Ended

Sent by: (202) 646-6681

-7908

Telecopy number: 702-794-7907

Verification number:

Confirmation: 702-794-7919.

Date:

Time:

Comments: PLEASE FIND ATTACHED DOE MEMO 8-19-88 PROVIDING ADDITIONAL TASK 'A' INFORMATION.
COULD YOU ARRANGE TO PASS THIS INFORMATION TO SAIC, SNL, LLNL & BECHTEL. —/—

United States Government **Department of Energy**

memorandum

05073

DATE: JUN 23 1988

REPLY TO ATTN OF: RW-22

SUBJECT: Preliminary Action Plan for System Studies to Support the MRS Commission

TO: Larry Skousen, NNWSI
E.C. Norman, DOE-RL
B. Jackson, Weston

The attached DOE Memorandum dated May 31, 1988 (Stein/Kale) details the action plan to identify technical studies necessary to provide support to the MRS commission.

In response to study tasks B, C, D, and E outlined in the May 31 memorandum, the enclosed preliminary action plan has been developed which will require support form your respective organizations and contractors.

A meeting to discuss this preliminary plan will be held in Washington, D.C., on Wednesday June 29, 1988. The meeting will be held from 8:30-12:00 in room 5A-092 of the Forrestal Building. We are especially interested in resolving specifically what work need to be done, who will perform this work, what time is required, and can this work be performed without conflict with other duties which have been assigned high priority. Please invite those key personnel (including contract personnel) that you consider appropriate to support this work. Mr. Tom Gutmann will be leading this activity and you may feel free to contact him if you have any questions.

H. Jackson Hale

H. Jackson Hale, Acting Chief
Surface Facilities and
Waste Package Branch

Enclosures

cc: S. Kale
C. Kouts
S. Brocoum
M. Frei
J. Richardson-Weston

88-2099
ACTION: LSKOUSEN
CC: GERTZ
CC: MERKLEY
CC: _____
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6/23/88
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memorandum

05073

DATE: May 31, 1988

REPLY TO ATTN OF: RW-30

SUBJECT: Action Plan for System Studies to Support the MRS Commission

TO: Director, Siting and Facilities Technology Division
Director, Systems Integration and Transportation Division
Director, Licensing and Compliance Division

The passage of the Nuclear Waste Policy Amendments Act of 1987 (NWPAA) modified the basis from which OCRWM has derived and developed the configuration of major elements of the waste system (repository, MRS facility, and transportation). While the key principles of the NWPA of 1982 remain unaltered, NWPAA provisions focusing site characterization solely at Yucca Mountain, conditionally authorizing an MRS facility and establishing an MRS Review Commission make it prudent for the Department to reexamine the overall waste system configuration. In particular, the role of an MRS facility in this system should be reexamined in time to support the MRS Commission in preparing a report to Congress by June 1989 documenting their evaluation of the need for an MRS.

Attached is an plan which has been developed to identify the near-term technical studies necessary to prepare a report documenting our technical position on an MRS facility and to be responsive to the MRS Commission. This plan identifies specific studies to be performed, including scope, responsible organizations, expected effort in man-months, and schedule for completion. The Integration Branch of the Office of Systems Integration and Regulations will have the responsibility for coordinating these studies while they are being performed and for preparing the final report based on the output of the individual studies.

Recognizing the significance and visibility of the results of this activity, program participants are requested to assign a high priority to supporting this effort.

Ralph Stein,
Acting Associate Director,
Office of Systems Integration
Regulations

Stephen H. Kale,
Acting Associate Director,
Office of Facilities and
Siting and Development

Attachment

cc: T. Isaacs, RW-40
L. Barrett, RW-40
S. Rousso, RW-10
R. Blaney, RW-42
J. Carlson, RW-442
J. Saltzman, RW-20
K. Klein, RW-30
M. Frei, RW-22
J. Hale, RW-222
E. Regnier, RW-331
D. Shelor, RW-322
E. Wilmot, RW-321
W. Danker, RW-321
C. Kouts, RW-321

MRS SYSTEMS STUDY

OVERVIEW

Since the passage of the NWPAA it has become apparent that a reexamination of the role of MRS in the waste management system is appropriate. What is proposed is a series of short-term analyses supported by various OCRWM program areas that will provide the necessary information for an updated evaluation of MRS. It is also proposed that the material generated in this MRS reassessment effort be available in such a timeframe that the results of these studies will be available to the MRS Commission in its evaluation of the need for the MRS for its report to the Congress.

ACTION PLAN

As indicated above, in order to assess the various roles for the MRS in the waste management system, a series of interdependent analyses must be performed that will require input from virtually all areas of OCRWM. Many of the required data inputs from the various program areas will be obtainable from either ongoing studies or existing data. On the other hand, there are certain areas of inquiry that will require new effort and a great deal of interactive communication between those performing the specific study and those involved in pulling together all aspects of the needed information.

PART 1.

The process to be followed in evaluating system impacts for a variety of MRS roles in the system follows a series of analytical steps:

I. Definition of the set of variable parameters of interest which can impact the overall waste management system when an MRS is included.

Examples: MRS functions
MRS location
MRS deployment mode (Phased -- storage first, packaging later or Non-Phased -- storage and packaging constructed to commence operations together)
Repository functions
System schedules (acceptance rates)
Western fuel strategy
Location of high-level waste packaging
Waste package design

II. Selection of a variety of system scenarios that are most representative of the range of likely system options.

Simplified Examples: System Scenarios

a) MRS stores intact fuel only
Repository does all system packaging and emplaces
Mission Plan Amendment Schedule

b) MRS receives all spent fuel, consolidates and produces clean canister for repository. (MRS has non-phased deployment)
Repository packages final disposal container and emplaces.
Mission Plan Amendment Schedule

c) MRS does all system packaging (MRS-phased deployment)
Repository receives final disposal container from MRS and emplaces.
Delayed Repository Schedule

III. Analysis of system effects (System Development/System Operations/Cost/Risk) for facility configurations and scenarios identified under Section II. above.*

* All system scenarios evaluated will be compared to a waste management system without an MRS facility. As a result all systems effects will be presented as delta's or impacts to the repository-only system. This approach allows the scenarios to be evaluated on an equal basis relative to each other. It is also consistent with the approach historically used by the program to show the impacts of an MRS on the system. The evaluation criteria for assessing the merits of the various options will also be set out in Section III. activities.

PART 2.

Study Tasks

The following list identifies the major areas of study for the evaluation of the role of the MRS.

A. Scenario Development & System Logistics

B. Facility Design (Repository/MRS)

C. MRS Storage Concept

D. High-Level Wastes

E. Waste Package Design

F. Transportation Analyses

G. System Storage, At-Reactor Impact & Integration Analyses

H. Licensing

I. System Reliability Analysis

J. Summary Analyses & Final Report Preparation

All information needed from the various areas (except the last) should be developed by no later than the end of September 1988 to allow time for an overall study report by early 1989.

The above information areas are furthered amplified below on the attached study definition sheets which provide a description of the specific studies to be undertaken, a statement on the expected deliverable, appropriate lead organizations, estimates of the amount of effort required and the date by which those analyses should be completed to provide timely input for the completion of an overall study report to HQ Management.

Systems Study Task Management

The responsibility for the timely and comprehensive completion of the identified tasks for this effort resides with the program office identified for each task. The Integration Branch of OSIR will have the responsibility for coordinating the efforts and resolving issues as they arise. Integration staff will meet on a bi-weekly basis either collectively or individually with the appropriate organizational unit to coordinate, resolve issues and assess progress on each study task.

A. SCENARIO DEVELOPMENT AND SYSTEM LOGISTICS

Before the various study areas can initiate work, the overall scope of the systems study effort needs to be developed to define the various system scenarios that will be analyzed and to define the system logistics that will be used for each scenario. Special attention should be given to a variety of schedules including commencement of operations, under which each scenario could be applicable. This initial work will help guide the other tasks and must be reviewed and concurred in prior to initiation of those tasks activities that are dependent on the results of this task. Scenarios should address how waste package design might influence the MRS. They should also address how high-level wastes as well as other wastes should be handled.

DELIVERABLE: A presentation of the logic utilized to develop the system scenarios to be included in the effort, along with a presentation of the variables considered and finally the list of main line system scenarios and sensitivity scenarios to be studied in the overall effort.

RESPONSIBLE HQ ORGANIZATION: Integration Branch

Contractor Organizations: Weston

Total Effort: 1-2 man/months

Completion Date: June 28, 1988

B. FACILITY DESIGN (REPOSITORY/MRS)

A reevaluation of many of the facility design analyses performed in 1985 under the auspices of the MRS/Repository Interface Task Force need to be undertaken. The major questions to be answered relate to the location, extent and cost of surface facilities (MRS/Repository), as various system scenarios move packaging functions of the reference repository design (SCP/CDR) to the MRS facility. Depending on which MRS scenario is being evaluated, the impact on facility designs will vary. As an example, a storage-only MRS would not significantly alter the present repository design, while an MRS which ships disposal-ready containers could assume all of the packaging functions currently allocated to the repository. Estimates for surface facility construction and operating costs and construction schedules will need to be developed for each scenario to help determine the changes in overall system life cycle costs due to each scenario. The associated uncertainty with the above analyses will also be developed and presented as part of the analyses performed.

Probably the most challenging aspect of the Facility Design task will be to reconfigure the MRS given the potential concept of phased deployment for the MRS facility. The original design work that was performed by Ralph M. Parsons did not assume a facility that was deployed on the basis of storage first and packaging later. Nor was the MRS storage concept designed to afford the system maximum flexibility in tailoring heat loads for packaging or emplacement operations, if that turns out to be a requirement of the system as identified by the waste package strategy. (See Task E - Waste Package Design)

The information developed in this task will be used to compare the impacts on the repository design and construction (cost, schedule and associated uncertainties) and waste preparation of the MRS as proposed and as revised, vis-a-vis at-reactor storage.

(Another part of this effort will be to identify all the surface facility related functions that are planned for the system in the area of spent fuel assembly testing, accountability and QA. Besides determining where these functions should be allocated in the system, this information will be helpful to the Systems Integration Program in identifying all functions of the waste management system for later use in systems studies and analyses.)

DELIVERABLE: This task will provide a report that, for each system configuration of interest, includes for both the MRS and the repository surface facility in question:

Construction costs of each facility.

Operating costs of each facility including the amount and mix of personnel to operate each facility.
Construction schedules for each facility.
Associated uncertainty with the above three items.

In addition to the above, the general rationale utilized in developing the above information for each scenario evaluated will be presented.

RESPONSIBLE HQ ORGANIZATION: Surface Facilities and Waste Package Branch

Contractor Organizations: Sandia, Bechtel, PNL, Ralph M. Parsons Co., Weston

Total Effort: 8-18 man/months
(This is the minimum effort expected after agreement on scenarios. Actual effort is dependent on number of scenarios and level of specificity.)

Completion Date: September 30, 1988

C. MRS STORAGE CONCEPT

The storage technology that is presently designed into the MRS (sealed storage cask) may not be optimal from a materials handling standpoint should the repository emplacement strategy require well defined heat-tailored waste packages. Depending on the waste package strategy (See Task E. - Waste Package Design), a review of spent fuel dry storage technologies may be needed to determine if perhaps another mode of storage at the MRS is better suited to the evolving needs of the system.

As part of this task, an assessment of storage technologies for use in a phased deployment MRS facility will also be addressed. Specifically, the questions to be answered are on what schedule and at what costs could each storage technology evaluated be deployed on a fast track basis. In addition, this task will address the capability of each storage technology to be integrated with a high-level waste packaging facility.

This task will also address the ability of each storage technology under consideration to be integrated with at-reactor storage activities.

DELIVERABLE: A task report addressing each of the above items in depth, with technical back-up material included, along with appropriate references.

RESPONSIBLE HQ ORGANIZATION: Surface Facilities and Waste Package Branch
(This is the minimum effort expected, depending on the ability to use previously developed storage technology data.)

Contractor Organizations: PNL, Weston

Total Effort: 3-6 man/months

Completion Date: August 1, 1988

D. HIGH LEVEL WASTES

One of the study areas initially addressed in the MRS/Repository Task Force effort that needs to be reassessed is the subject of high-level (Commercial and Defense) waste packaging and handling. Given the fact that the MRS could package all spent fuel, a logical question that follows is whether the MRS could also package high-level wastes for the system. The issues and costs associated with the repository surface facility and the MRS facility regarding high-level wastes need to be identified and evaluated in some detail in the overall assessment of the MRS in the waste management system. This task will most likely be folded into the Facility design task.

(See Task B - FACILITY DESIGN (REPOSITORY/MRS) for specific information needs that accompany this task.)

DELIVERABLE: A task report addressing each of the above items in depth, with technical back-up material included, along with appropriate references. (This task report may be folded into the Task B report.)

RESPONSIBLE HQ ORGANIZATION: Surface Facilities and Waste Package Branch

Contractor Organizations: Sandia, Bechtel, Weston

Total Effort: 2-4 man/months

Completion Date: August 1, 1988

E. WASTE PACKAGE DESIGN

The strategy that is being developed to bring the repository site and the engineered barrier system into compliance with 10 CFR 60 to safely isolate radioactive wastes from the environment is key to assuring that the MRS is properly integrated into the waste management system.

From a systems perspective the integration point between the MRS and the repository centers on the design of the waste package container (dimensions and materials make-up) and its fabrication specifications. In this regard, the strategy and design of the waste package container can have a direct bearing on whether the MRS will a) manufacture the waste package container; b) produce a canister that fits into the waste package container, or c) only store intact spent fuel assemblies.

Given the above information needs, a thorough review of the progress of the present waste package design along with existing and potential alternative designs is needed to assess if any limiting factors presently exist that could influence what packaging functions are allocated to an MRS. Also, this task should explore whether the existence of an MRS canister could create problems in designing, loading, or sealing the waste package container at the repository.

One major information product of this task is a presentation of the latest thinking on the need for heat-tailored waste packages in the repository. This information will be necessary to assess the impacts of that potential requirement on the MRS and on the system as a whole.

Another aspect of this task will be to define the site-specific tuff canister the MRS would make if the MRS is in a canistering mode. Spent fuel canister capacities will be needed for consolidated fuel and unconsolidated assemblies along with dimensions and costs of both types of canisters. Since questions of if and where consolidation takes place in the waste management impact system configurations in fundamental ways, this task needs to consider the cases of handling both intact and consolidated spent fuel in the waste package.

The results of this task will provide needed input to compare the impacts on the waste package design, fabrication and standardization of the MRS, as proposed and as revised, vis-a-vis at-reactor storage.

DELIVERABLE: A task report addressing each of the above items in depth, with technical back-up material included, along with appropriate references.

RESPONSIBLE HQ ORGANIZATION:	Surface Facilities and Waste Package Branch
Contractor Organizations:	Sandia, Lawrence Livermore, Weston
Total Effort:	2-3 man/months
Completion Date:	July 1, 1988

F. TRANSPORTATION ANALYSES

At this time, there exist no discriminating engineering factors regarding whether the system functions allocated to an eastern site MRS or a western site MRS should be different. As a result, one decision discriminator could be associated with system cost. To help resolve this issue, generic transportation analyses need to be performed to determine the transportation impacts (shipment miles/cask miles/costs) associated with various MRS packaging scenarios.

Parametric transportation routing and cost analyses of generic eastern and western MRS sites, where the MRS produces either the Tuff container or a Tuff-specific canister (or only sends intact spent fuel assemblies to the repository) need to be undertaken to address this issue. Along with the spent fuel routing and cost analyses, similar analyses need to be undertaken for high-level wastes, since potential scenarios to be evaluated will have the MRS also packaging high-level wastes for the system.

DELIVERABLE: A task report addressing each of the above items in depth, with technical back-up material included, along with appropriate references.

RESPONSIBLE HQ ORGANIZATION: Transportation Branch

Contractor Organizations: Battelle Columbus, PNL, Weston

Total Effort: 4-5 man/months

Completion Date: September 1, 1988

G. SYSTEM STORAGE, AT-REACTOR IMPACT & INTEGRATION ANALYSES

This task will assess the implications and impact of system storage on system operations, as well as addressing the impacts on reactors of the various system scenarios. Another important part of this task will be to analyze the best methods for integrating at-reactor operations with waste management system operations.

The first part of this effort will focus on the need for system storage given the scenarios identified for the normal, expected operations of the system. In addition, such items as the possible need to campaign wastes for packaging requirements (e.g., heat management), planning for operational anomalies (contingency planning), addressing potential changes in waste acceptance priorities (full core reserve, decommissioning reactors, Annual Capacity Report issues, etc.) and other appropriate considerations will also be factored into the analysis of system storage needs.

One of the major effects that an MRS can have on the waste management system, depending on when it is deployed, is the alleviation of the burden of at-reactor storage. For the various system scenarios studied in this effort, this task would quantify the magnitude of at-reactor avoided storage, the associated costs savings to utilities due to the operation of an MRS, and the impact of the various scenarios on reactor decommissionings.

Besides the above quantification of impacts on at-reactor operations, this task will also address the identification and analysis of methods for integrating at-reactor activities and actions with the operations of the waste management system at both the MRS and the Repository to optimize system operations.

Example: The integration of dual-purpose casks with the storage capability of the MRS and with the transportation system. Potential costs savings to the system and schedule impacts should be addressed. (Other examples to be addressed include use of concrete storage modules, NUHOMS and rod consolidation, etc. at reactor sites and how these operations can best be utilized to optimize the operations of the system.)

DELIVERABLE: A task report addressing each of the above items in depth, with technical back-up material included, along with appropriate references.

RESPONSIBLE HQ ORGANIZATION: Integration Branch

Contractor Organizations: Weston, PNL

Total Effort: 3-6 man/months

Completion Date: September 1, 1988

H. LICENSING

During the MRS/Repository Interface Task Force effort one of the issues addressed was the impact of the MRS on the repository receiving a license to construct from the NRC. That subject needs to be readdressed in light of the potential for the MRS to play a different role in the system than has been proposed by the Department in the past.

Specifically, one of the main issues to be addressed by this task is whether any unforeseen licensing problems could arise should a decision be made that the disposal container would be produced at the MRS and then shipped to the repository. Other study efforts include attempting to quantify any schedule benefits to simplifying the licensing process for the repository to largely underground concerns.

DELIVERABLE: A task report addressing each of the above items in depth, with technical back-up material included, along with appropriate references.

RESPONSIBLE HQ ORGANIZATION: Licensing Branch

Contractor Organizations: Battelle Columbus, Weston

Total Effort: 2-3 man/months

Completion Date: September 1, 1988

I. SYSTEM RELIABILITY ANALYSIS

For the various system configurations studied in this effort, this task would evaluate the reliability of the waste management system to function and fulfill its mission successfully.

Such factors as facility design capabilities, redundancy in system capability and system contingency capabilities should all be addressed in this task. A reliability comparison of the various system configurations with an MRS to a repository-only /at-reactor storage system would be the product of this effort. Ideally, a quantitative reliability analysis would be optimal in addressing this task. Such an analysis would assign numerical reliability factors to all major components of the system and would show the effects of the various changes to the overall system as dictated by the scenarios. If a quantitative analysis cannot be developed in the timeframe required, due to the relative technical immaturity of the facility designs and of the program as a whole, a qualitative analysis using engineering judgement for the development of reliability quotients for the major system components should be generated with available technical information. Those generated quotients would apply to the various scenarios under evaluation as a discriminator for determining differences between the system scenarios under study.

The results of this task will be used to compare the impacts on the reliability of the National system for the disposal of radioactive waste of the MRS as proposed and as revised, vis-a-vis at-reactor storage.

DELIVERABLE: A task report addressing each of the above items in depth, with technical back-up material included, along with appropriate references.

RESPONSIBLE HQ ORGANIZATION: Integration Branch

Contractor Organizations: Weston, PNL

Total Effort: 2-4 man/months

Completion Date: September 1, 1988

J. SUMMARY ANALYSES & FINAL REPORT PREPARATION

After the above tasks have been completed, the developed information will need to be compiled, analyzed and incorporated into a final overall study report. The report will address all the technical items called out in the NWPAA that the Congress required the Commission to study.

In addition to incorporating the results of the above tasks, this task of the effort will compare the impacts of an MRS on the ability of the Secretary to fulfill contractual commitments of the Department under the NWPAA to accept spent fuel for disposal for an MRS as proposed and as revised, vis-a-vis at-reactor storage.

In addressing the above subject area, this task will also assess the impacts on economics factors, including the impact on the electric utilities for temporary at-reactor storage of spent fuel prior to final disposal in a repository, as well as the costs likely to be imposed on the ratepayers of the Nation's electric utilities in building and operating such a facility, as proposed and as revised.

DELIVERABLE: Final reporting on the overall effort to Headquarters Management

RESPONSIBLE HQ ORGANIZATION: Integration Branch

Contractor Organizations:	Weston
Total Effort:	4-5 man/months
Completion Date:	January 2, 1989 (assuming that all information necessary for the report is complete no later than Nov. 1, 1988.)

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PHONE (202) 646-6600

Mr. H. Jackson Hale, Acting Chief
Surface Facilities and Waste
Package Branch
Siting and Facilities Technology
Division
Office of Facilities Siting
and Development
Office of Civilian Radioactive
Waste Management
U.S. Department of Energy
Washington, D.C. 20585

June 24,1988
HQW.880624.0001

Subject: Action Plan to Support the MRS System Studies
Contract DE-AC01-87-RW00060, Work Package 3514-02-04-1002

Dear Mr. Hale:

In response to your memorandum to Robert E. Jackson (June 3, 1988), we enclose for your consideration the Action Plan to perform Study Tasks B, C, D & E described and scheduled in the DOE (Kale/Stein) memorandum of May 31, 1988.

This Action Plan addresses each of the individual study tasks and defines the work to be performed, the estimated schedule of task products, the types of resources required and the estimate of the WESTON contribution to these resources. For each task a Gantt chart has been developed showing the individual activity start and completion dates and the interactions between the tasks covered in this plan (Study Tasks B, C, D & E) and the interfaces with the remaining study tasks of the overall MRS Action Plan for System Studies to support the MRS Commission (Study Tasks A, F, G, H, I, and J).

The preliminary information available from study task 'A' shows that 43 potential cases have been described for the different combinations of MRS and repository functions, HLW destinations, MRS locations, and western spent fuel strategy. Each of these cases will be studied assuming several different acceptance schedule assumptions, leading to a number of scenarios for study. However, these scenarios can be translated into about 5 discrete arrangements of MRS and repository facility designs and it is on this basis that the manpower estimates have been made. This will be confirmed as part of the first activities of Study Task 'B'.

To meet the schedule for these study activities, the following working modes and levels of accuracy for the end products being produced are being proposed.

1. Engineering design activities would be performed in workshop settings with the end products in the form of mark-up engineering drawings of the existing MRS and repository surface facility designs. WESTON would act as the co-ordinator for these activities; project resources would be used to provide technical input and evaluation.

2. For the scheduling and cost estimating activities WESTON would have the responsibility for translating the mark-up engineering drawings into equipment, material quantities, and operating staff take-offs and formatting these into the cost accounts used for TSLCC estimates.

3. The level of accuracy of the cost estimates would be of the order of that met during similar work for the 1985 MRS/Repository Interface Task Force, namely ± 35%.

4. The final preparation of the study tasks reports would be performed by WESTON.

5. Because very little work has been done on the "heat tailored" waste package concept at NNWSI, the only work feasible on this concept consistent with the Schedule and labor constraints on Task E is to prepare a brief qualitative comparison of the impacts of this concept on waste package design and repository underground facility design and operations with the reference concept envisioned in the SCP conceptual design report. A more detailed study of repository "heat management" is planned for completion in FY 89.

If you have any questions on these proposals, please contact me on (202) 646-6681 for Study Plans B, C, & D, and Ed Benz on (202) 646-6679 for Study Plan 'E'.

Sincerely,

WESTON TECHNICAL SUPPORT TEAM

J A. Richardson.

John Richardson, Manager
Surface Facilities Section
Engineering and Geoscience
Department

Approved by

William M. Hewitt
Program Manager

Enclosures

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Records Center
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C. Hawley
M. Cline

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Action Plan for Systems Studies
B, C, D and E to Support MRS Commission

Introduction

The Nuclear Waste Policy Act of 1982 (NWPA) required the Department of Energy to identify sites suitable for characterization for use as a repository and to select three sites for characterization. The NWPA also required DOE to submit a site specific conceptual design for a Monitored Retrievable Storage (MRS) facility along with a report on the need for and feasibility of an MRS. The DOE identified three sites for characterization and submitted the requested MRS report and conceptual design to Congress in 1987. In conjunction with the preparation of repository site characterization plans, the DOE also prepared preliminary site characterization conceptual designs for each of the three candidate repository sites.

In conjunction with the preparation of the MRS Need and Feasibility Report, the DOE conducted extensive systems design studies to identify the functions which should most logically be performed at each facility (repository or MRS). The results of that study are contained in DOE-RW-0044.

In the NWPAA, the Congress directed DOE to proceed with characterization of the repository site at Yucca Mountain, Nevada, and to terminate work at other candidate sites. The Congress also conditionally authorized an MRS, but nullified DOE's selected site, and directed that MRS construction not be initiated until a repository construction authorization is issued. In so doing, the Congress significantly altered many of the bases for the earlier repository - MRS interface studies, necessitating that they be reevaluated to establish the roles of the MRS and repository in the newly authorized system.

The NWPAA also established an MRS Review Commission and directed that they report back to Congress by June, 1989 on the role of the MRS in the waste management system.

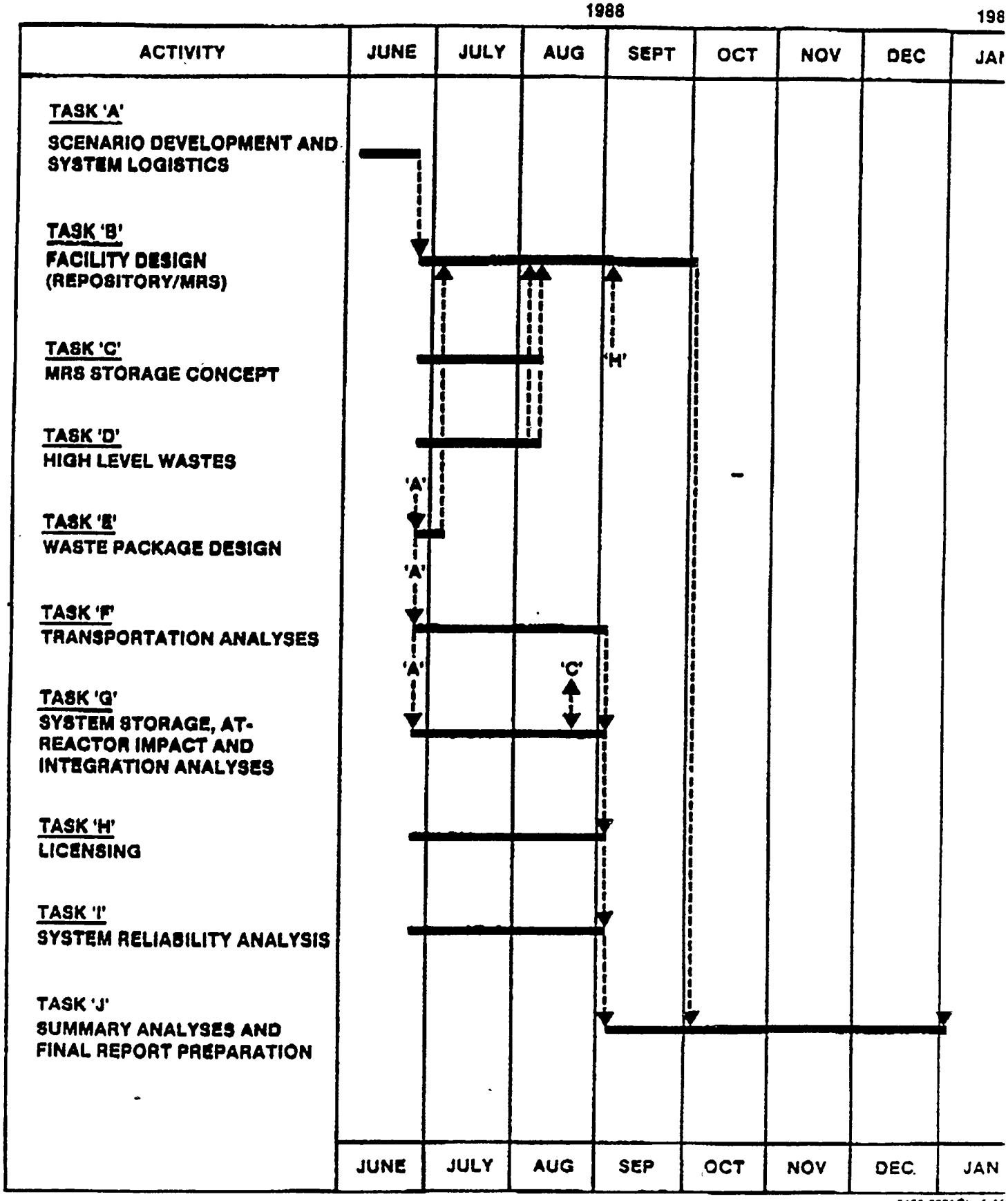
Scope

The DOE has prepared an action plan for performing system studies to establish the preferred MRS configuration in a time frame consistent with its use by the MRS Review Commission prior to preparation of its report to Congress in June, 1989. The action plan was transmitted by DOE memorandum, from Stein and Kale to Director, Siting and Facilities Technology Division, et. al., dated May 31, 1988, and is illustrated in summary form in the following figure 1.

The action plan emphasizes the need for completion of the studies in a timely fashion to support the MRS Commission in preparing a report to Congress by June 1989. The plan identifies tasks to be done, responsible parties, study participants, time frames for completion of the various tasks, and estimates of the labor requirements by task.

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FIGURE 1
ACTION PLAN FOR SYSTEM STUDIES TO SUPPORT THE MRS COMMISSION



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Tasks identified in the plan are:

A. Scenario Development and System Logistics
B. Facility Design (Repository/MRS)
C. MRS Storage Concept
D. High Level Waste
E. Waste Package Design
F. Transportation Analyses
G. System Storage, At-Reactor Impact & Integration Analyses
H. Licensing
I. System Reliability Analyses
J. Summary Analysis & Final Report Preparation

By memorandum, H. Jackson Hale to Bob Jackson dated June 3, 1988, DOE requested that "WESTON assign a high priority to completion of the tasks they will be performing for the Surface Facilities and Waste Package Branch", specifically, items B through E above*. This memorandum also requested development of a plan for assuring timely completion of these tasks.

The following were requested:

a. Specific task statements for work to be performed by WESTON and other contractor organizations.
b. Identification of any required sequencing of these tasks.
c. Estimated man-hours for each task for each contractor organization.
d. Estimated begin and completion dates for each activity.
e. Statements of the most expedient method for acquiring and funding the necessary resources.
f. A summary of the above information in the form of a GANTT chart.

In addition, it was requested that WESTON perform as much of the required task effort as possible.

This plan represents WESTON's response to these requests.

General Planning Assumptions

1. Because of the limited time available for completion and the limited personnel resources assigned each task in the Action Plan, it is assumed that all tasks are to be performed based on existing information and that no new design work or acceleration of planned and on-going studies is to be done.

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*WESTON is performing a lead-coordination function for all tasks; however, this plan deals only with items B through E.

7 #585

2. DOE will take actions necessary to ensure availability of contractor personnel resources (other than WESTON) and resolve priority conflicts so as to permit timely completion of each task. For the design engineering activities to be performed by study tasks 'B', 'C', 'D' and 'E', it is considered essential that the originating facility and facility and component design organizations be involved as these designs are modified to match the requirements set by the set of scenarios to be evaluated. Specifically, for example, for the no-MRS scenario, the existing SCP-CDR repository design would be the benchmark, and for a full function MRS with the repository performing receipt and underground emplacement functions only, the MRS conceptual design of September 1985 would be used as the benchmark.

3. Interfacing tasks, such as Task A - Scenario Development and System Logistics, will provide necessary information in a timely fashion, and that the numbers of scenarios to be evaluated are consistent with personnel resources and schedule constraints. For the purposes of the planning estimates being made, it is being assumed that the number of discrete scenarios will not exceed 5 in number. (Preliminary information available at the time of preparation of this plan indicates that there are 43 discrete cases for evaluation. A quick review of this information indicates that by taking advantage of common features from case to case, approximately 5 cases evolve requiring detailed evaluation of surface facility designs. This conclusion will be confirmed and refined as part of Task B.)

4. Review and concurrence functions of project office personnel will be provided either by participation of project office personnel in working groups, or in such a way as to not delay timely completion and issue of reports to interfacing activities. Effort of DOE HQ's and project office personnel are not included in staffing estimates.

5. Estimates for contractor resources under control of other project offices will be supplied after DOE arranges for participation of those contractors. Use of A/E's will be left to the discretion of the DOE project offices.

STUDY TASK 'B' - FACILITY DESIGN (REPOSITORY/MRS)

Introduction

The work will be in the form of a single free standing design report. This study will reexamine the existing MRS and repository surface facility designs to determine how these designs are affected to suit the total system scenarios developed from study task 'A'. For example, the current MRS Proposal to Congress in March 1987 was based on the NWPA (1982) study requirements to demonstrate the uses and feasibility for a monitored retrievable storage facility. This design was developed through the activities of the Interface Task Force during 1985. The NWPAA (1987) nullified the MRS proposal for siting the facility at Clinch River, Tennessee, and authorized an MRS to be sited elsewhere with specific conditions. In the case of the repository surface facility the current designs are included in the NNWSI SCP-CDR and provide for two separate waste handling buildings for phased waste receipt operations.

The engineering/design review activities will be performed by means of workshops involving the MRS and repository designers, and will adapt the respective MRS and repository surface facility engineering diagrams and drawings to suit the functional requirements depicted in the system scenarios to be accommodated. The WESTON role will be to co-ordinate the design workshop reviews and to compile the record documentation.

The estimates for construction schedules and costs for the facilities under each scenario will be the prime responsibility of WESTON with the support from the MRS and repository organizations as required.

WESTON will compile the final report and address the specific issues of MRS phased deployment, tailored waste package heat loads study task 'E', and the interactions with at-reactor storage as covered under study task 'G'. The study task statement of work is broken down into individual subtasks as follows-

Subtask B-1. This subtask to be performed primarily by the MRS facility designer (PNL/Parsons) and the repository surface facility designer (Sandia/Bechtel) and co-ordinated by WESTON in a workshop setting. It will evaluate the scenarios to be defined by study task 'A' and translate these into functional activities at the MRS and repository in the form of marked-up mechanical flow diagrams using existing MRS and repository engineering drawings. The first activity will be to translate the 43 potential cases for MRS study included in study task 'B' into a number of discrete MRS and repository facility arrangements. These functional allocations between the MRS and the repository surface facilities for each scenario will be used to develop the corresponding site plot plans, and building general arrangements in the form of mark ups of existing engineering drawings.

9 #15-85

Specific attention will be given to (a) the impacts of the concept of heat tailored waste packages on the facilities' design for heat measurements, in-process cell lag storage, accountability, and the use of partially filled waste packages, (b) the assessment of the impacts of the concept of MRS facility phased deployment, and (c) impacts from study task D-High Level Wastes-assessing packaging of commercial and defense HLW at the MRS facility.

Subtask B-2. This subtask will be performed primarily by WESTON scheduling engineers with support from the MRS and repository projects organization scheduling engineers as required.

The information to be developed will be as follows:

1) - Provide GANTT chart for each scenario to show engineering and construction activities to define the areas of MRS and repository design, licensing, site preparation, and construction of surface facilities.

2) - Provide schedule durations for the activities identified and life cycle schedule for the program phases of construction, operation and decommissioning.

3) - Provide detailed schedules to show licensing steps for each scenario.

4) - Provide discussions on the critical paths and the important differences for each scenario and the areas of major uncertainties.

Subtask B-3. This task will be performed primarily by WESTON cost estimating engineers with support from the MRS and repository projects organization estimating engineers as required.

The cost estimates for construction, operation, and decommissioning phases will be structured in a similar manner to the January 1988 TSLCC analysis with the existing definitions of cost accounts. The approach will be to address the scenario variations for the individual cost accounts in the waste handling buildings areas and to standardize the support and utility costs for all the scenarios. The MRS and repository costs will be bench marked against the existing MRS proposal and repository TSLCC cost estimates respectively. The level of accuracy aimed for in the cost comparison measurements for the MRS and repository for each of the scenarios will be that previously achieved in the 1985 MRS/repository interface task force, namely ±35%. Cost estimates will be based on the following input data for each scenario.

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(a) building sizes (square and cubic feet)

(b) material quantities (cubic feet)

(c) equipment quantities ($ per unit)

(d) waste package costs ($ per unit)

(e) labor rates ($ per man-hour)

(f) construction management (% of the total construction)

(g) constructing (% of total construction)

(h) staffing levels (FTE's) by job category and number of shifts.

(i) on-site generator radioactive waste quantities.

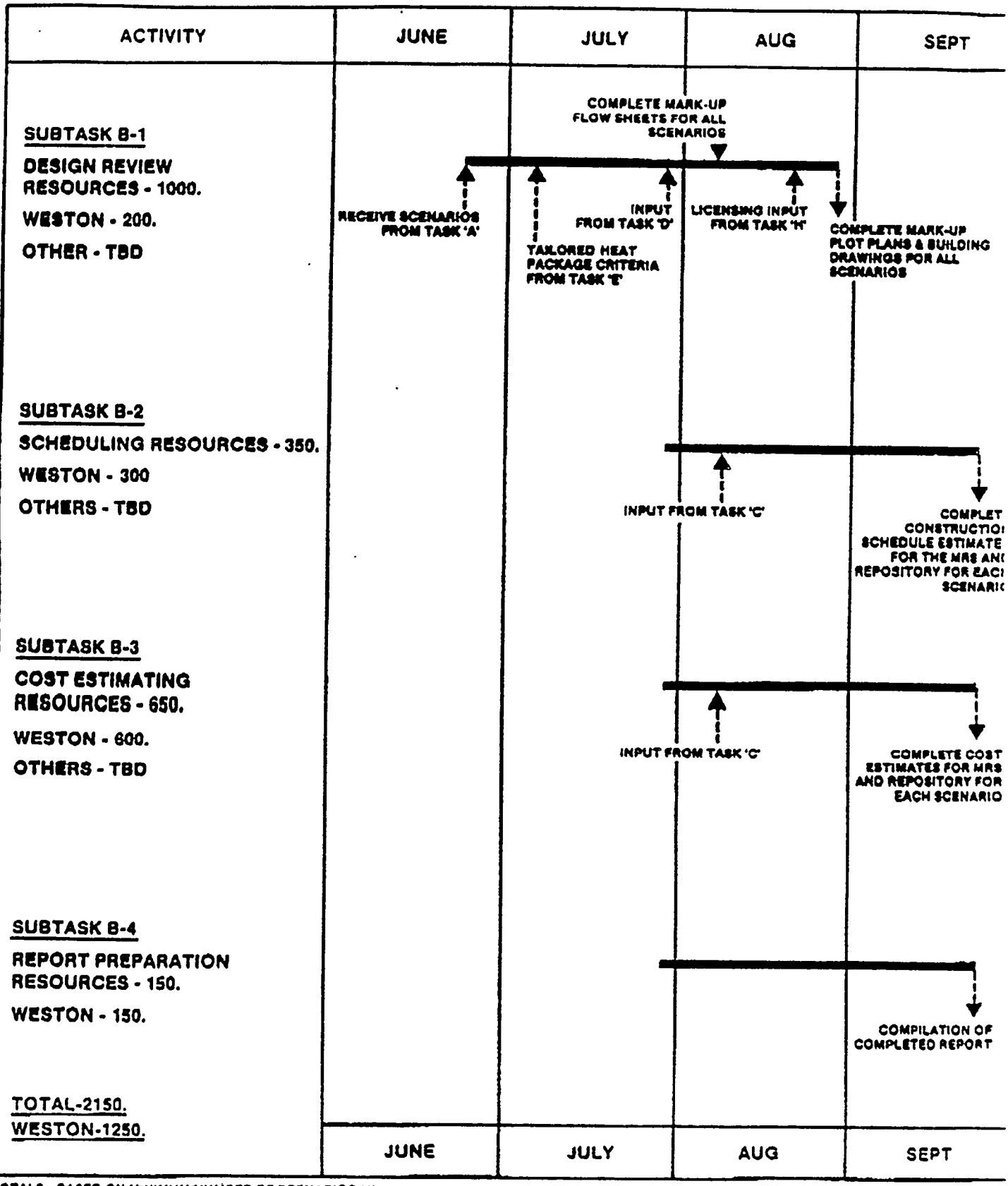
(j) support facilities and utilities-constant unless otherwise noted.

Subtask B-4. This will be performed by WESTON and will be the compilation of the final report documentation giving the construction schedules, construction costs, operating costs, and associated areas of uncertainty in these estimates for each of the selected system scenarios for the MRS and repository surface facilities.

The scheduled completion date is September 30, 1988 and the minimum total resource requirement is estimated 2150 man-hours based on discrete system scenarios not exceeding 5. The estimated breakdowns in man-hours per subtask are as shown on the attached bar charts, namely B-1 = 1,000, B-2 = 350, B-3 = 650, and B-4 = 150, with a total WESTON contribution of 1250 overall with the balance assigned to others. The more detailed breakdowns of the WESTON support by department category and man-hours are also enclosed for each subtask.

11 #7585

MRS COMMISSION SYSTEM STUDIES
TASK 'B' - FACILITY DESIGN (REPOSITORY/MRS) SCHEDULE AND RESOURCE REQUIREMENTS (MAN-HOURS)



TOTALS - BASED ON MINIMUM NUMBER OF SCENARIOS (4)
(MAN-MONTHS) TOTAL - 10, WESTON - 5.5

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Study Task 'B'

WESTON RESOURCES

•	Engineering Design	-	430 man-hours
•	Scheduling Engineers	-	210 " "
•	Cost Engineers	-	530 " "
•	Editorial Review	-	80 " "
	TOTAL		1,250

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Study Task 'C' - MRS Storage Concept

Introduction

This work will be a free standing design report. The study will re-examine the spent fuel dry storage options that were considered at the time of the preparation of the MRS proposal and the work that has been performed for the DOE Dry Cask Storage Study in response to Section 5604 of the NWPAA (1987). These technologies will be evaluated against the following additional functional requirements:

(a) capability to support a repository emplacement strategy using heat tailored waste packages;

(b) adaptability for use in phased deployment MRS;

(c) capability of each storage technology to be integrated with at-reactor storage activities;

(d) capability of each storage technology to be integrated with a high-level waste packaging facility.

The work to be performed is broken down into the following subtasks.

Subtask C-1 This task will be performed jointly by PNL and WESTON and will evaluate the following dry storage technologies in meeting the additional functional requirements mentioned above:

(a) Dual-purpose (transport-storage) metal casks;

(b) Dry horizontal concrete modules (NUHOMS);

(c) Dry concrete sealed casks (silo);

(d) Dry well;

(e) Modular dry vault storage.

The storage capacities reviewed will be based on the NWPAA (1987) limits of 10,000 MTU before repository operations and 15,000 MTU after repository operations.

Particular attention will be given to identifying the major NRC licensing issues associated with each storage technology.

Subtask C-2 This task will be performed by WESTON with PNL support and will determine the construction schedule and the cost estimates for each storage technology when deployed in a phased MRS facility.

14 #1585

The schedule information will be in the form of GANTT charts to show:

(a) engineering and construction activities;

(b) schedule durations for the activities identified and the life cycle schedules for the program phases of construction, operation and decommissioning;

(c) provide detailed schedules to show licensing steps and the critical paths differences for each storage technology.

Subtask C-3 This task will be performed by WESTON with PNL support and will provide cost estimates for the construction, specification and decommissioning periods of the project, and will use the existing definitions of cost accounts contained in the January 1988 TSLCC as appropriate. The approach will be to standardize the support and utility costs for each storage technology and to determine the cost differences for each storage mode. Cost estimates will be based on the following input data:

(a) building sizes (square and cubic feet);

(b) material quantities (cubic feet);

(c) equipment quantities ($ per unit);

(d) labor rates ($ per man hour);

(e) construction management (% of the total construction cost);

(f) contingency (% of the total construction cost);

(g) staffing levels (FTE's) by job category and number of operating shifts;

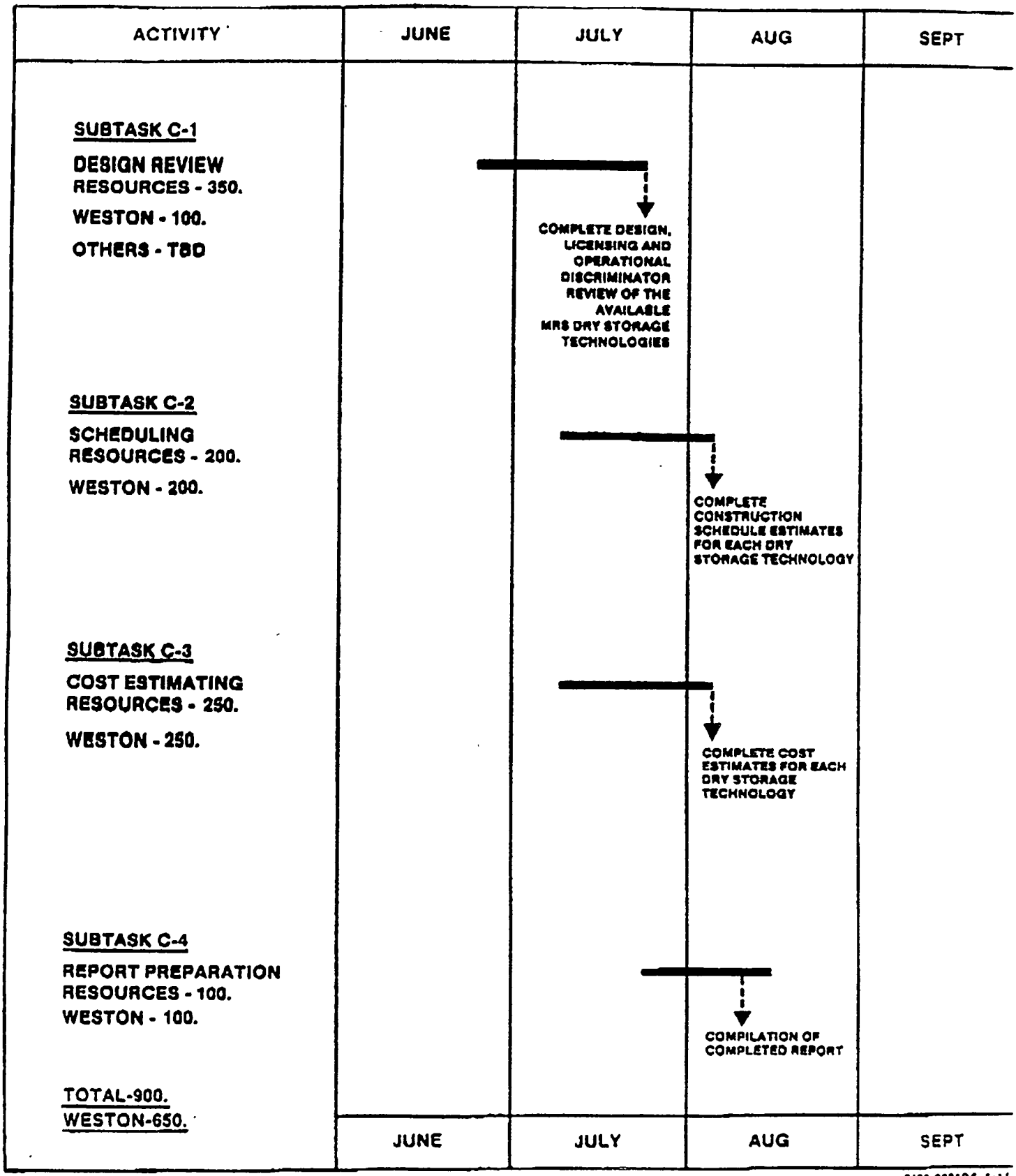
(h) support facilities and utilities - constant unless otherwise noted.

Subtask C-3 This task will be performed by WESTON and will be the compilation of the final report documentation.

The scheduled completion date is August 1988 and the minimum total resource requirement is estimated at 900 man-hours with the estimated breakdown as shown on the attached bar chart, namely, C-1 = 350 man-hours, C-2 = 200 man-hours, C-3 = 250 man-hours and C-4 = 100 man-hours. The WESTON resource requirement is estimated at 650 man-hours with the balance assigned to others. The detailed breakdowns of the WESTON support by person and man-hours are also enclosed for each subtask category.

15 #1585

MRS COMMISSION SYSTEM STUDIES TASK 'C' - MRS STORAGE CONCEPT SCHEDULE AND RESOURCE REQUIREMENTS (MAN-HOURS)



TOTALS - TOTAL - 6
(MAN-MONTHS) WESTON - 4

0408-0021DS 5/15

16 #1585

STUDY TASK 'C'

WESTON RESOURCES

• Engineering Design	- 410	man-hours
• Scheduling Engineers	- 60	" "
• Cost Engineers	- 135	" "
• Editorial Review	- 45	" "
TOTAL	650	

STUDY TASK 'D' - HIGH LEVEL WASTES

Introduction This report will be prepared as a supporting attachment to Study Task 'B' - Facility Design (Repository/MRS). The work will review studies performed by the MRS/Repository Interface Task Force of 1985 on the issues and costs associated with high-level (commercial and defense) waste packaging and handling at the MRS as opposed to performing these operations at the repository, and determine if the conclusions reached at that time of not packaging at the MRS are still valid.

The work will be performed by WESTON, Sandia and LLNL and is described as follows:

(a) review the engineering implications of receiving, packaging, storing and shipping high-level (commercial and defense) wastes at the MRS, and reexamine the Repository Interface Task Force (DOE-RW-0044), specifically sections 4.3 and 5.7.

(b) review the licensing implications of performing packaging functions at an MRS facility licensed under 10 CFR 72, transporting with casks under 10 CFR 71 and emplacing at the repository under 10 CFR 60 regulations.

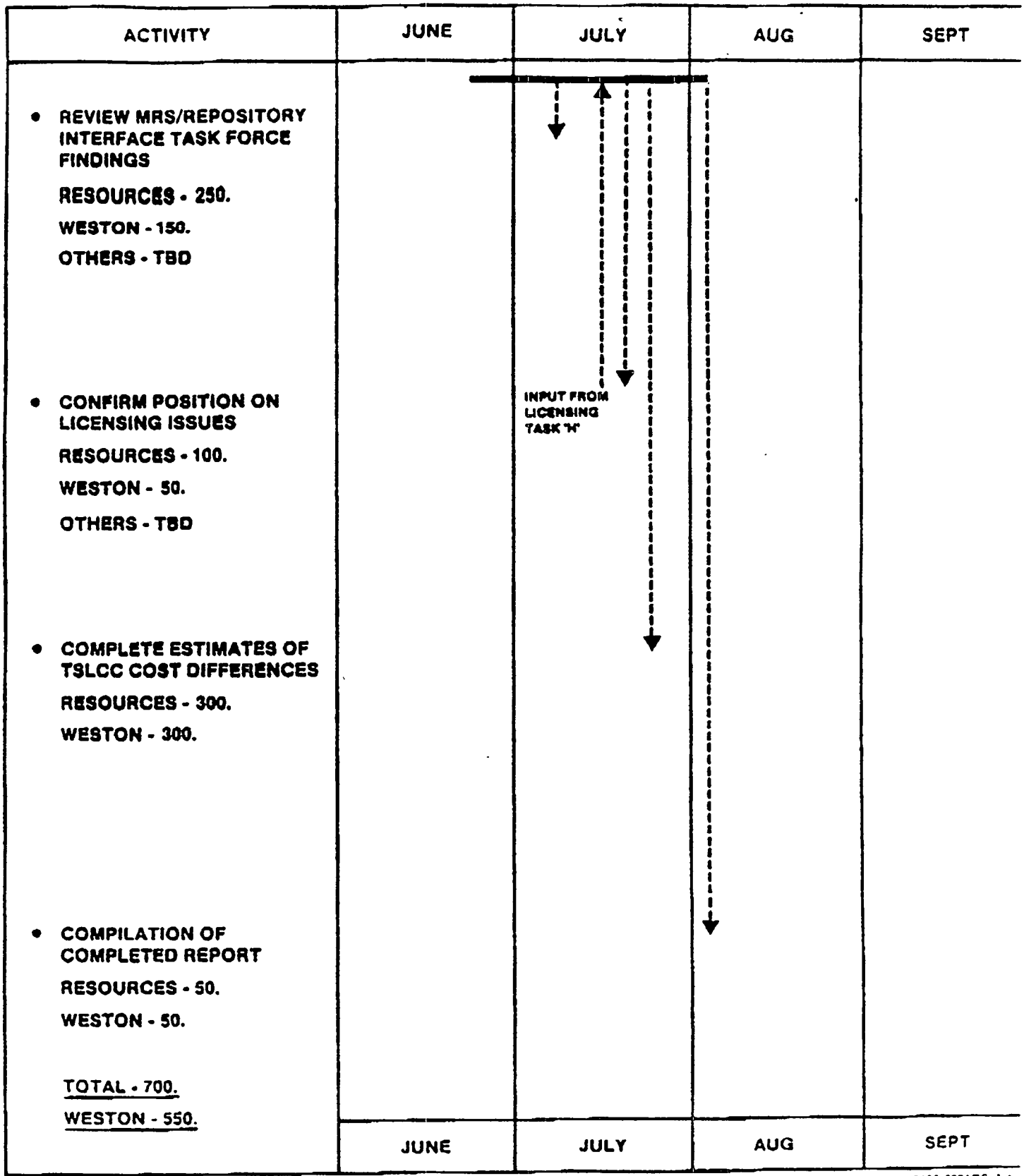
(c) estimate the TSLCC differences between packaging at an MRS and at the repository.

(d) summarize results of the study fundings.

The scheduled completion date for this work is August 1988 and the total resource requirement is estimated at 700 man-hours of which the WESTON allocation is estimated at 550 man-hours as depicted on the attached bar charts. The detailed breakdown of the WESTON support by department category and man-hours are enclosed.

18 #13-85

MRS COMMISSION SYSTEM STUDIES TASK 'D' - HIGH LEVEL WASTES SCHEDULE AND RESOURCE REQUIREMENTS (MAN-HOURS)



TOTALS - TOTAL 4.0 (MAN-MONTHS) - WESTON

0404-002*DS 6.*.

05073

19 #525

STUDY TASK 'D'

WESTON RESOURCES

• Engineering Design	- 210	man-hours
• Cost Engineers	- 285	" "
• Editorial Review	- 55	" "
TOTAL	550	

20 #15-85

Study Task E - Waste Package Design

The Waste Package Design Task provides input to other tasks on waste package components' configurations, dimensions and costs. Descriptive information on MRS canisters for spent fuel will be developed and an evaluation of their interfaces with the disposal containers will be discussed. Similarly, descriptive information for the metal barrier (container) concepts under consideration for all metal alloy candidates currently under evaluation will also be provided. Brief descriptions of alternative waste package design concepts which are being evaluated by the NNWSI project will also be prepared.

Because no evaluation of the concept of "heat tailored" waste packages has yet been performed by the NNWSI project, (a pre-ACD study of underground layout, areal power density, and waste emplacement is to be completed in FY 89) only a brief discussion of this concept and its potential impacts on waste package design and repository design and operation will be provided and compared to the reference concept described in the SCP-CDR.

Information for this task will be developed at a workshop coordinated by WESTON. NNWSI project representatives, most likely from LLNL and SNL (SAIC, Las Vegas could supply alternative personnel) will provide the necessary materials. Draft sketches and written materials will be provided by July 1, 1988 for use by other tasks. Project and HQ's review and concurrence will proceed in parallel with a final report issued by August 1, 1988.

Subtask E.1 - This subtask will produce summary information on the current reference waste package design concept based on the thin-walled metal container. For each of the container material candidates currently under consideration, i.e. 304L stainless steel, 316L stainless steel, alloy 825, copper, 70-30 copper nickel, and aluminum bronze, the following shall be provided:

1. Container dimensions and weights for each of the waste forms under consideration: intact spent fuel, consolidated spent fuel, Savannah River DHLW, and West Valley CHLW. For spent fuel, information should be provided for concepts with and without an MRS canister. (See Subtask E.3)

2. Fabrication, assembly, and inspection procedures which would be carried out at the repository or MRS.

3. As-assembled costs, excluding costs of waste form, transportation, handling and emplacement.

4. Identification of any considerations (e.g. transportation effects on package integrity) which might differentiate between assembly at the MRS and at the repository. This shall include consideration of the question of whether MRS canisters might cause problems in designing, loading, or sealing the waste package containers.

21

#1585

Subtask E.2 - This subtask will provide a summary compilation of descriptive material of waste package concepts under consideration as "Alternatives." This report will include illustrative sketches, where practical, showing application of each concept and, to the extent available, information requested in items 1 through 4 under Subtask E.1. for waste forms under consideration.

Subtask E.3 - This subtask is to prepare a description of the spent fuel canisters to be prepared by an MRS. Canisters for both intact and consolidated spent fuel should be described. The descriptions should include illustrative sketches and the following:

1. Dimensions, weights and costs

2. Fabrication, assembly, and inspection requirements, including receipt inspections at the repository.

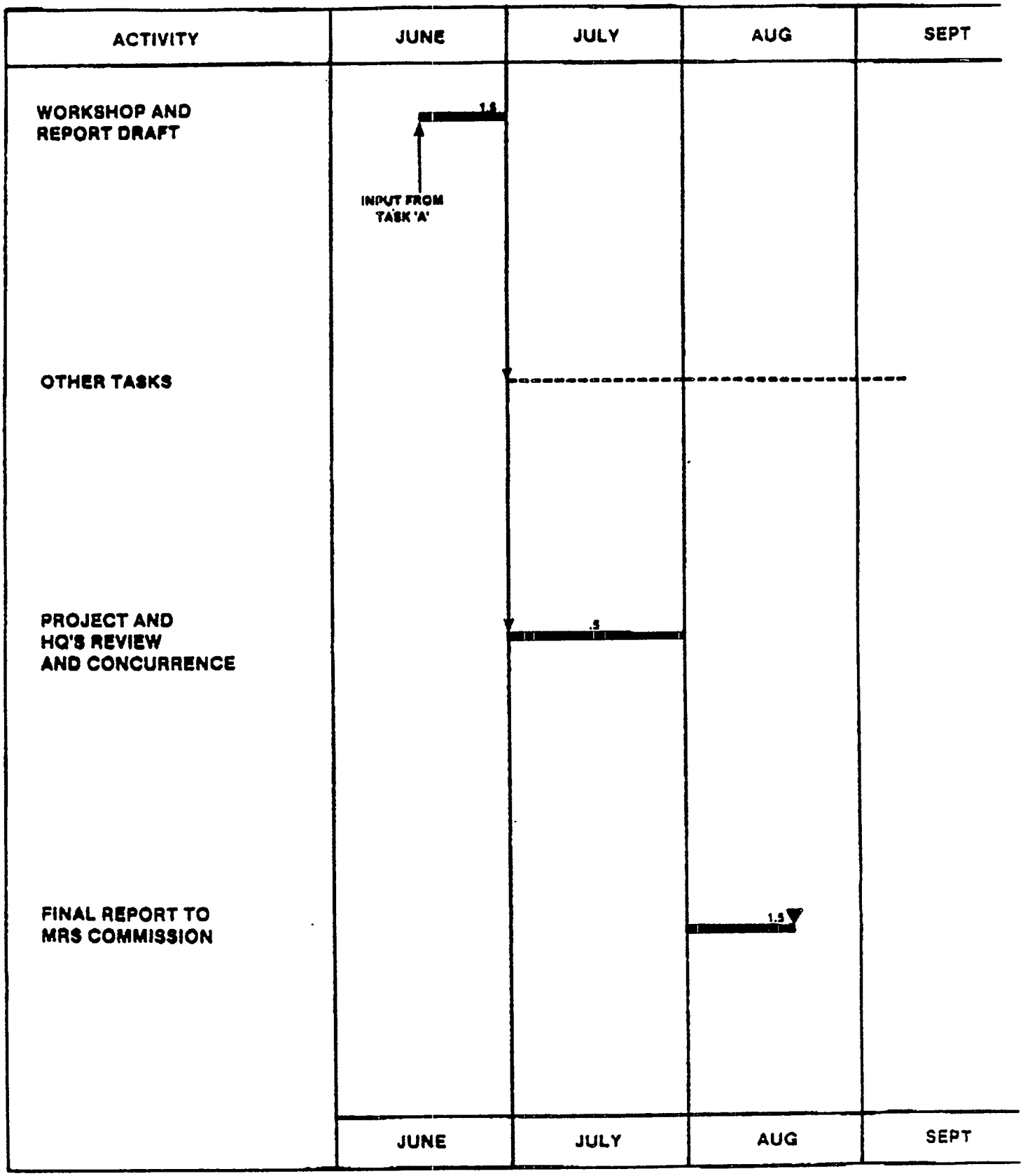
3. As assembled costs, excluding cost of waste form preparation.

The canisters described shall be used in Subtask E.1.

Subtask E.4 - This subtask shall prepare a discussion of the potential benefits and impacts of "heat tailored" spent fuel waste packages on repository design and operations and on long term waste package performance. The report shall be based on existing information and current project plans; planned pre-ACD studies shall not be accelerated for the subtask. Factors to be considered are: impacts on underground facility design, requirements for increased "in process storage", and other surface facility design and operation considerations.

22 #15

MRS COMMISSION SYSTEM STUDIES
TASK 'E'-WASTE PACKAGE DESIGN
SCHEDULE AND RESOURCE REQUIREMENTS*



*WESTON RESOURCE REQUIREMENTS ONLY.
TOTAL WESTON RESOURCE COMMITMENT—2 MAN MONTHS

0408-0021CH 8-17-

06. 23 88 15:04 FOPSTL NO. 22- 001

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6-82

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NR: DTG: 2

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H. Jackson Hale
RW-222

7. OFFICIAL BUSINESS
(Signature of authorizing official) (TIME) P.M.

8. DATE
4/25/88

9. TO
1) Larry Skousen (NEVADA OPS)
~~[redacted]~~
2) E.C. Norman, DOE-RL

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☐ Multiple Address
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MESSAGE IDENTIFICATION
NR: DTG: Z

6. FROM H Jackson Hole RW-22a

7. OFFICIAL BUSINESS [signature] 2:45 (TIME) A.M. P.M.
(Signature of authorizing official)

8. DATE 6/23/88

9. TO
1) E.C. Norman, DOE-RL
2) Larry Skousen (NEVADA OPS)

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88 JUN 17 PM 4:47
001585

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United States Government **Department of Energy**

memorandum

DATE: OCT 18 1988

REPLY TO ATTN OF: RW-222

SUBJECT: MRS Systems Studies

TO: Larry Skousen, Acting Director
Engineering and Development Division
Yucca Mountain Project Office

ACTION
CC: Bell
CC: Wilmot
CC: Rodriguez
CC: Bard
CC: Wade
CC: Brown
CC: Cloninger
CC:
CC:
CC:

RECD IN WMPO
10/18/88

Over the past three months, the Surface Facilities and Waste Package Branch of OCRWM has been utilizing the support of MRS and repository project personnel in conducting Tasks B, C, D, and E of the MRS Systems Studies. As agreed at the July 20, 1988 meeting in Las Vegas, Weston will be producing the final task reports based on draft input from the repository and MRS participants. In addition, stand-alone reports on Task B data will be produced by YMPO and MRS personnel similar to those produced in support of the 1985 MRS/Repository Interface Task Force. The repository participants will also produce a report on the information presented in Task E. DOE-HQ will review the draft YMPO and MRS reports before finalization.

With regard to Task B, preliminary information giving specific assumptions for the sensitivity studies identified in Task A of the MRS Systems Studies ("MRS Systems Studies, Task A Report", Stein to Kale, August 2, 1988; "MRS Systems Study/Task A Clarification", Danker to Hale, et al, August 19, 1988) was faxed to your office and SNL during the week of September 26. Subsequently, a conference call was held on September 27 to discuss needed repository input. The sensitivity studies described in the attachment are considered to be part of the scope of work as described in Task A.

As agreed at the August 3-4 meeting, the schedules for the MRS Systems Studies tasks have slipped due to a late start on Task A, Scenario Development and System Logistics (see attached schedule). It is recognized that the revised schedule is still tight; however, we do request your special attention to these activities to assure the schedule does not slip further. Please note that the dates shown on the attached schedule are the dates for Weston's issuance of their task reports. In order to meet these dates, we need to receive the repository input earlier as agreed to at the August 3-4 meeting.

If you have any questions, please call Naomi Moon on FTS 896-9738.

for Charles E. Brooke
H. Jackson Hale, Chief
Surface Facilities and
Waste Package Branch
Office of Civilian Radioactive
Waste Management

Attachments

cc (w/att): S. Kale, RW-20
J. Saltzman, RW-20
M. Frei, RW-22
N. Moon, RW-222
W. Danker, RW-321
G. Rodriguez, YMPO
T. Zvada, YMPO
J. Richardson, Weston

MRS COMMISSION STUDIES

Study (B) - Sensitivity Studies

References
(1) DOE Memorandum dated August 2, 1988 - MRS System Studies, Task A Report
(2) DOE Memorandum dated August 19, 1988 - MRS Systems Study - Task A Clarification.
(3) NUTECH/NUHOMS technical paper, dated 1987, Design and Operation of Large Capacity Horizontal Modular Storage System for Irradiated Nuclear Fuel.

For the purposes of addressing the sensitivity studies required by Task "A" under References (1) and (2), the following 4 specific activities have been identified in priority order and to be performed by the repository field office under Tasks 'B' responsibilities.

1. Repository phased operations, as required by Reference (2), item 7, will be based on the earlier guidance transmitted by FAX to DOE-NV on September 21, 1988, and repeated as follows:

   - For Cases Nos 1 and 2 Sensitivity Studies for phased operations at the repository the following waste acceptance rates can be applied for the limiting waste receipt date of 2003 required by to Scenario No. 1 of Reference (1).

     - 2001. 300 MTU (All dual purpose casks)
     - 2002. 300 MTU (All dual purpose casks)
     - 2003. 400 MTU (150 MTU dual purpose casks, 250 MTU Waste Handling Building Facilities)
     - 2004. 900 MTU (All Waste Handling Building Facilities)

2. For cases 6, 7, 8, and 9 where the MRS performs contanerization analyze adding packaging capabilities at the repository for 200 and 400 MTU/year of DHLW. (Reference (1), Section H - Sensitivity Analyses, item 1, and support to Task 'D' - High Level Waste).

3. For cases 1 and 2 analyze receipt of 25%, 50%,and 100% of reactor overspill as consolidated fuel in square open canisters similar to Figures 4A and 4B being used for case 5. (Reference (1) Section H-Sensitivity Analyses, item, 2).

4. For cases 1 and 2 analyze receipt of 25%, 50%, and 100% of reactor overspill as intact fuel in the form of NUTECH/NUHOMS canisters. (Reference (1), Section H - Sensitivity analyses, item 2). For the purposes of this work the NUHOMS 24P canister data from reference (3) is to be used as follows:

   Length - 4.64 m (186.5 in)
   Diameter - 1.71 m (67.24 in)
   Wall Thickness - (16 mm (0.625 in)
   Material - Stainless Steel
   Capacity - 24 PWR (intact)
   - 52 PWR (intact)
   Weight - 36,290 Kg (80,000) lb

The attachment 1 provides the quantities (MTU (year) to be used for items 3 and 4.

ATTACHMENT 1 — 100%

ANNUAL RECEIPT OF REACTOR OVERSPILL (MTU)
TUFF 1ST REPOSITORY/NO MRS
NO NEW ORDERS, END OF LIFE

Year	PWR	BWR
2003	0	0
2004	0	0
2005	0	0
2006	1	14
2007	0	0
2008	28	0
2009	7	5
2010	13	34
2011	11	368
2012	390	71
2013	11	129
2014	394	19
2015	290	0
2016	393	57
2017	133	194
2018	57	28
2019	31	65
2020	404	252
2021	137	10
2022	90	0
2023	144	0
2024	78	0
2025	602	64
2026	0	61

FIGURE 1
SCHEDULE FOR MRS SYSTEM STUDIES

