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REVISED FEASIBILITY STUDY REPORT

FOR SILOS 1 AND 2

40730-RP-0001

U.S. Department of Energy
Fernald Environmental Management Project

VOLUME 2 OF 4
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FERNALD
Environmental Management Project

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COST ESTIMATE SUMMARY

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ACRONYMS & ABBREVIATIONS

A - K

A/E	Architect/Engineer
avg	average
AWR	Accelerated Waste Retrieval
AWWT	Advanced Wastewater Treatment
BCY	bank cubic yards
bf	board feet
CCTV	closed circuit television
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act, as amended
clrk	clerk
cnt	count
coord	coordinator
crft	craft
cu. ft.	cubic feet
CY	calendar year
D&D	decontamination and demolition
DFC	direct field costs
DOE	U.S. Department of Energy
ea	each
FAT&LC	Fernald Atomic Trades and Labor Council
FDF	Fluor Daniel Fernald
FEMP	Fernald Environmental Management Project
FICA	Federal Insurance Contributions Act
FS	Feasibility Study
ft	feet
FTE	full-time equivalent
FUI	Federal Unemployment Insurance
FY	fiscal year
GA	general arrangement
GET	General Employee Training
HDPE	high density polyethylene
hr	hour(s)
HVAC	heating, ventilation and air conditioning
ICY	interior cubic yards
IFC	indirect field costs
IH	Industrial Hygiene

ACRONYMS & ABBREVIATIONS (continued)

L - S

lb/ft^2	pound(s) per square feet
LCY	loose cubic yards
LF	linear feet
LOE	level of effort
LS	lump sum
maint	maintenance
mat'l	material
MC&A	Materials Control and Accountability
MD	man day(s)
mgmt	management
mgr	manager
mhr	manhour(s)
mi	mile(s)
misc	miscellaneous
MTC	monolith transfer container
MTO	material take-off
MVO	motor vehicle operator
NTS	Nevada Test Site
O&M	Operations and Maintenance
OPS	operations
OSDF	On-site Disposal Facility
PD	per day
PFD	process flow diagram
PKG	package
POP	Proof of Principle
PPE	personal protective equipment
pr	pair
QA	Quality Assurance
QC	Quality Control
QTY	quantity
RAD	radiation
RCS	Radon Control System
ROD	Record of Decision
S/C	subcontract
SEG	Scientific Ecology Group, Inc.
STD	standard
SUI	State Unemployment Insurance
supv	supervisor
sy	square yard

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ACRONYMS & ABBREVIATIONS (continued)

T - Z

tech	technician
tn	ton
TPC	total project cost
TTA	Transfer Tank Area
UPS	Uninterruptible Power System
util	utilities
V	volts
WAC	waste acceptance criteria
wkr	worker
wt%	weight percent
yr	year

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C.1.0 Introduction

This appendix contains a summary of the cost estimates developed for the following four alternative technologies being evaluated in this Feasibility Study (FS) for the stabilization of the Silos 1 and 2 material:

- Vitrification — Joule-heated;
- Vitrification — Other;
- Chemical Stabilization — Cement-based; and
- Chemical Stabilization — Other.

The estimated cost associated with implementing an alternative is one of five balancing criteria used in the FS process under the Comprehensive Environmental Response, Compensation and Liability Act, as amended (CERCLA). Cost estimates are used in the FS process to identify those remediation alternatives that are significantly more expensive than competing alternatives but do not offer commensurate performance or effectiveness.

The cost estimates prepared in support of this FS are detailed and comprehensive in nature. However, the estimates' accuracy is a function of the preconceptual design. Given the fact that future vendors will be given the opportunity to propose their unique design based on their commercial experience, the full-scale treatment facility design may change significantly. Therefore, by definition, the accuracy of each estimate is roughly +50/-30%. This considers the dollar amount that will ultimately be bid in response to a request for proposal to stabilize the Silos 1 and 2 material [following the Record of Decision (ROD) amendment].

C.1.1 FS Cost Basis Summary

The cost estimates presented in this FS address key project elements for each alternative and should not be construed as the total project cost (TPC) of remediation of the Silos 1 and 2 material at the Fernald Environmental Management Project (FEMP).

The cost estimates summarized in this appendix were prepared in accordance with **the Basis of Design and Description (Appendix G)**, which incorporates technology-specific data generated on the four technologies during the Proof of Principle (POP) Testing Project **(Appendix H)**. The estimates employ a wide variety of cost-estimating methods and techniques such as generic unit costs, vendor information, U.S. Department of Energy (DOE) guidance, conventional cost-estimating guides, commercial remediation costs, and cost information based on actual FEMP operation and maintenance experience on jobs of similar magnitude and complexity. The key cost elements reflected in the work breakdown structure of the FS estimates are: (1) capital costs (direct and indirect); (2) engineering cost estimates; (3) operations and maintenance (O&M) costs; (4) decontamination and demolition (D&D) costs; (5) waste packaging, transportation, and disposal costs; (6) project oversight and management costs; and (7) the contractor's cost of money.

C.1.2 Organization of this Appendix

Appendix C is divided into four separate cost estimates **(Sections C.2** through **C.5)**, one for each alternative technology listed in **Section C.1.1**.

Each alternative cost estimate is further divided into eight sub-sections that summarize the major cost components for each alternative as follows:

- Summary;
- Capital;
- Engineering;
- O&M;
- D&D;
- Project management;
- Waste packaging, transportation and disposal; and
- Cost of money estimate.

Each cost component contains a brief narrative that provides the basis for the cost estimate.

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C.1.3 General Assumptions

The goal of this section is to present pertinent background information and relevant supporting information for the vendor to develop a basis for common understanding of the cost estimates developed for the four alternatives. This section documents the assumptions and methods used in preparing the alternative estimates.

C.1.3.1 Cost Estimating Assumptions

The following is a summary of the key assumptions used to develop the four alternative cost estimates:

- Silos 1 and 2 material full-scale treatment facility will be designed, constructed, operated, and D&D using a turnkey contractor approach similar to the Silo 3 project remediation contract.
- There will not be any project funding constraints.
- Fluor Daniel Fernald (FDF) will provide O&M work force supporting the Silos 1 and 2 material remediation, in accordance with the current Fernald Atomic Trades and Labor Council (FAT&LC) labor agreement (1998 – 2001).
- FDF will provide technical and programmatic oversight of the turnkey contractor throughout the entire duration of Silos 1 and 2 material full-scale remediation project.
- FDF will provide the site infrastructure in support of the Silos 1 and 2 material full-scale treatment facility (electrical, water, natural gas, etc.).
- FDF will maintain necessary site functions in FY07 through FY10 in support of the Silos 1 and 2 remediation project (medical, fire department, Emergency Operations Center, human resources, Advanced Wastewater Treatment (AWWT) operations, etc.).
- It is assumed that debris from the D&D of the Silos 1 and 2 material full-scale treatment facility will meet the Nevada Test Site (NTS) waste acceptance criteria (WAC). Debris from D&D will be shipped via truck and disposed of at the NTS.
- It is assumed that any secondary wastes from the Silos 1 and 2 material treatment operations will meet the NTS WAC. Solid secondary waste from operations will be shipped via truck and disposed of at the NTS.
- FDF will transport the treated Silos 1 and 2 material via truck, under a separate contract, to the NTS for disposal and burial.
- Operation of the Silos 1 and 2 material full-scale treatment facilities will be three years.

- Silos 1 and 2 remediation project's indirect costs will be based on the FDF Estimating Guideline.
- The Silos 1 and 2 material will be transferred from the existing silos to an interim Transfer Tank Area (TTA) as part of the ongoing Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project, before the Silos 1 and 2 remediation project.
- The Radon Control System (RCS), which will be designed, constructed, and operated as part of the AWR Project, will be available to support the Silos 1 and 2 remediation project.

C.1.4 Incorporation of Proof of Principle Testing Information

In support of the development of the **Basis of Design and Description (Appendix G)** for the four alternative technologies being evaluated in this FS, the DOE-FEMP conducted POP testing **(Appendix H)**. The POP testing provided technology-specific information (e.g., performance, safety, reliability, implementability, cost and schedule) on commercially available technologies for the remediation of the Silos 1 and 2 material.

As discussed in **Appendix H**, as part of the POP Testing Project, the final reports submitted by the four contractors provided limited preconceptual designs for applying the respective technologies to the remediation of the silos material. In addition, each POP testing contractor provided specified cost information based on their proposed preconceptual design. The following discussion summarizes the cost information provided by the POP contractors and FDF.

C.1.4.1 Major Equipment Cost

- Equipment data sheets for technology-specific or critical process equipment in the contractor's proposed preconceptual design.
- General arrangement (GA) drawings and process flow diagrams (PFDs) to support the development of equipment cost for commercially available process equipment.

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C.1.4.2 Plant Cost

- GA drawings defining the process area and facility layout drawings to support the development of the full-scale treatment facility cost.
- Piping, electrical, instrumentation material take-off (MTO) quantities, estimates, and descriptions for non-standard or special order material (piping, electrical, instrumentation).

C.1.4.3 Operational Cost

Start-up Cost

Start-up consists of system operability testing and facility final checkout. FDF will develop the cost estimate for readiness and training activities based upon FEMP historical project labor experience.

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TABLE C. 1.4-1
SUMMARY OF START-UP COSTS

Component	Examples	Comment
Consumables	Chemical, frit, etc.	Unit quantities and unit cost.
Technical Support	Contractor technical oversight.	Full-time equivalent (FTE) and hourly rate.
Energy Usage (Utilities)	Electrical, water, natural gas, fuel, air, etc.	Unit quantities and unit cost.
Other Costs	Personal protective equipment (PPE), trailer rental, etc.	Unit quantities and unit cost.
Preliminary estimate of labor to support start-up of the full-scale facility based on the proposed technology. (FDF will incorporate the FEMP labor factors.)	Operators, general laborers, maintenance personnel, RAD techs, etc.	FTEs by job class.

Operational Cost

Operational cost consists of day-to-day operation and maintenance activities through the 3-year operational schedule.

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TABLE C. 1.4-2
SUMMARY OF OPERATIONAL COSTS

Component	Examples	Comment
Consumables	Chemical, frit, etc.	Unit quantities and unit cost.
Expected equipment lifetime	Replacement rate of major equipment.	Replacement frequency and labor requirements.
Spare parts and special tools	Major equipment, process critical equipment, spare parts, and special tooling.	Unit quantities and unit cost.
Technical Support	Contractor technical oversight.	FTE and hourly rate.
Energy Usage (Utilities)	Electrical, water, natural gas, fuel, air, etc.	Unit quantities and unit cost.
Other Costs	PPEs, equipment, trailer rental.	Unit quantities and unit cost.
Preliminary estimate of labor to support operation and maintenance of the full-scale facility based on the proposed technology. (FDF will incorporate the FEMP labor factors.)	Operators, general laborers, maintenance personnel, RAD techs, etc.	FTEs by job class.

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C.1.4.4 Project Management Cost

Project management cost consists of the FDF labor to oversee and manage the Silos 1 and 2 full-scale remediation activities as follows:

- D&D of the AWR TTA and RCS; and
- Cost of FDF project management support.

C.1.4.5 Cost of Money

The general assumption supporting the cost of money analysis is that the Silos 1 and 2 remediation project is performed by a turnkey, design-build and operations contract similar to the Silo 3 remediation contract. This contract philosophy is based on a fixed price contract where the remediation contractor will be reimbursed in accordance with a predetermined pay-item schedule. The remediation contractor will be financing the design and capital cost of the full-scale remediation facilities until the contractor delivers treated Silos 1 and 2 material in accordance with specified acceptance criteria.

This contract strategy transfers a substantial part of the risk to the contractor. Additionally, to finance the project, the contractor will be required to borrow money and pay interest (cost of money). Therefore, the FS cost estimates model with pay-outs and pay-ins includes an 8% interest rate.

The cost of money analysis is calculated based on the current Silos 1 and 2 project baseline schedule with three years of operation, and a proposed pay-item schedule based on the Silo 3 remediation contract. The cost of money model predicts cash outlay based on the estimates and schedule and determines the cost of money to support the pay-item schedule.

C.1.4.6 Profit

The profit margin for the engineering, construction, procurement, and operation estimates is 10% in accordance with DOE guidance for profit margin.

C.1.4.7 Cost Estimate Summary

As discussed in **Sections C.1.2** through **C.1.4**, the FS cost estimates are prepared in a structured, sequential manner. **Figure C.1.4-1** presents a summary diagram of the process used by the FS cost estimating team.

The Design Basis and Description (Appendix G) for the four FS alternatives was developed at the same time the POP Testing Project for the four technologies was being conducted (i.e., developed in parallel). FDF prepared the design basis in consultation with the four POP contractors. As new information was generated by the POP contractors, it was evaluated and incorporated into the design basis and the development of preliminary preconceptual designs for each alternative.

Based upon the preliminary preconceptual designs for each alternative and **the Design Basis and Description (Appendix G)**, cost estimates were initially prepared for each alternative. As the preconceptual designs and design basis evolved with the incorporation of new POP data, the cost estimates were appropriately modified to reflect the incorporation of the new data. This effort produced four individual cost estimates for implementing each technology. The estimates are of sufficient detail and quality to support the evaluation of competing alternatives in **Section 3** and **4** of this FS; i.e., to determine which alternatives may be significantly more expensive. However, they do not offer commensurate performance and effectiveness.

C.1.4.8 Present Worth Analysis

A present worth analysis is used in a FS to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year, usually the current year. This allows the cost of remedial action alternatives to be compared on the basis of a single figure representing the amount of money that, if invested in the base year and disbursed as needed, would be sufficient to cover all costs associated with the remedial action over its planned life.

In conducting with the present worth analysis, assumptions were made in this FS regarding the discount rate and the period of performance. Consistent with CERCLA and DOE guidance, a discount rate of 7 percent before taxes and after inflation was assumed. Estimates of the project costs in each of the planning years were made in constant dollars, representing the general purchasing power at the time of construction. The period of performance for costing purposes was based on the individual alternative schedules presented in **Section 3.**

To determine present worth costs, the following equation was used:

$$P = F\,(1+I)^{-n} \qquad \text{(Eq. 1)}$$

<u>Where</u>: P = present worth ($).
F = single payment in year n ($).
i = discount rate.
n = number of periods (years) of operation.

In order to perform the present worth calculation, the following implementing and simplifying assumptions were made:

- All capital costs for engineering, procurement, and construction costs occur in accordance with the FS schedule and are equally distributed over time;
- The plant operates for three years;
- Annual costs for O&M and for packaging, transportation, and disposal occur at the end of the year or at the end of the period if less than one year to complete;
- D&D costs occur at the end of the period;
- Costs are discounted on an annual basis, rather than monthly, daily, or continuously; and
- The discount rate used for the present worth calculations is 7% per CERCLA guidance[1], as revised by correspondence from EPA's Office of Emergency and Remedial Response[2] for sites that have a ROD targeted for fiscal year 1994 and thereafter. Present worth costs are summarized in **Table C.1.4-1**.

TABLE C. 1.4-3
SUMMARY OF PRESENT WORTH COSTS

Alternative	Present Worth Costs ($ Million)
VIT1	288
VIT2	277
CHEM1	242
CHEM2	248

1 U.S. Environmental Protection Agency (EPA). Office of Emergency and Remedial Response. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. EPA540G89004. Washington, D.C.: Dept. of Commerce National Technical Information Service (NTIS)*. ([1]AR Index No. G-000-1101.2)

* Documents can be ordered from the NTIS at 1-800-553-6847.

2 U.S. Environmental Protection Agency, 1993. Memorandum from Office of Emergency and Remedial Response to EPA Regional Directors, OWSER Directive No. 9355.3-20, June 25.

Figure C.1.4-1
FS Cost Estimate Development Flow Diagram
(For each of 4 alternatives)

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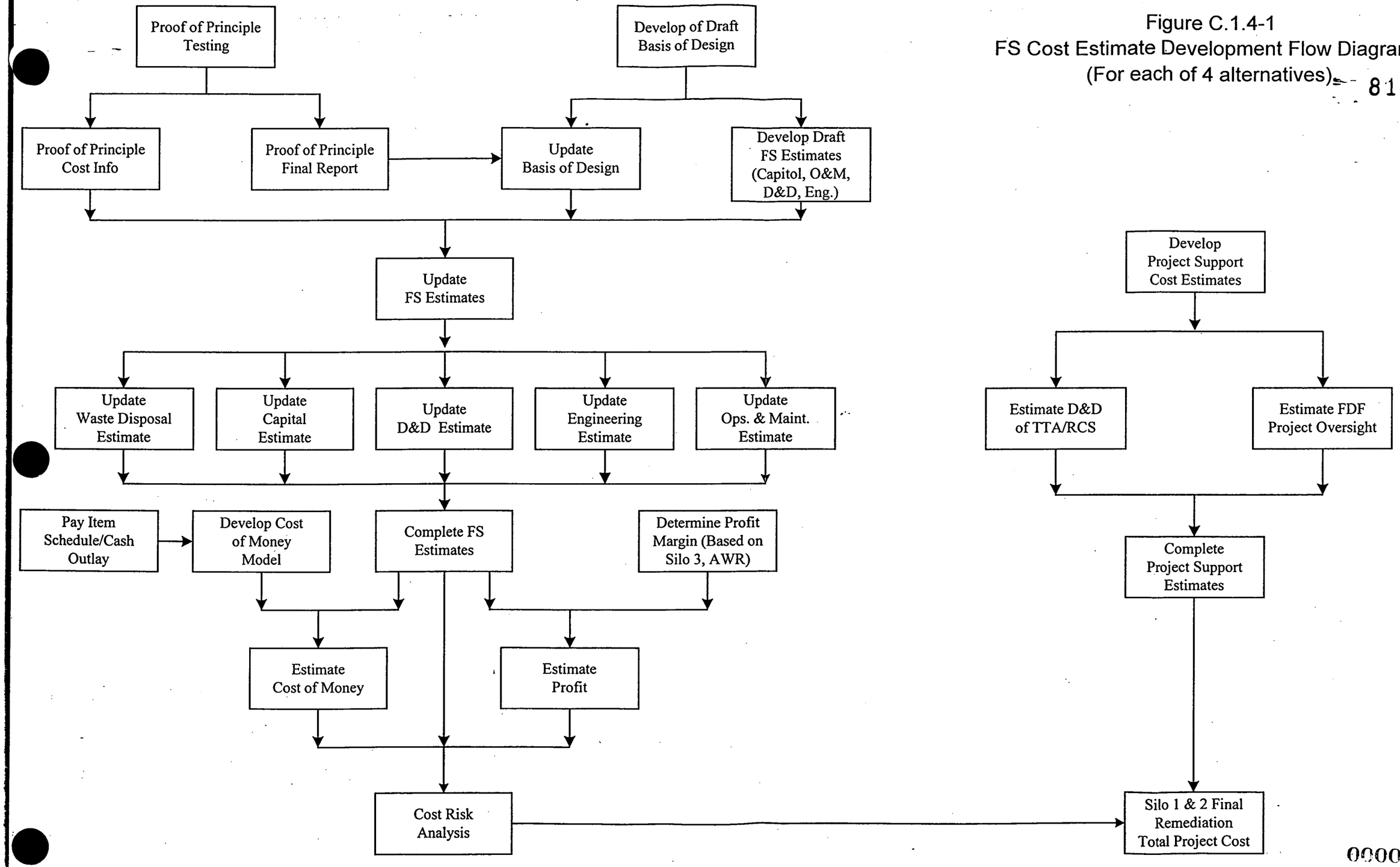

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C.2.0 VITRIFICATION – JOULE-HEATED

C.2.1 Cost Estimate Summary: Vitrification – Joule-heated

C.2.1.1 Introduction

The summary cost for the Vitrification — Joule-heated alternative (VIT1) is $354,745,840 in FY99 dollars, as shown in **Table C.2.1-1**.

TABLE C. 2.1-1
SUMMARY COST ESTIMATE FOR
VITRIFICATION — JOULE-HEATED

Section	Cost Element	Estimated Cost
C.2.2	Capital Cost	$69,084,413
C.2.3	Engineering Cost	$25,050,900
C.2.4	O&M	$133,854,320
C.2.5	D&D Cost	$34,503,692
C.2.6	Project Management Cost	$22,145,800
C.2.7	Waste Disposal Cost	$24,532,105
C.2.8	Cost of Money	$45,574,610
C.2.1	Summary Cost (Un-escalated)	$354,745,840

Supporting information for the Vitrification – Joule-heated (VIT1) cost estimate elements are provided in **Sections C.2.2** through **C.2.8**.

C.2.1.2 Attachment

The cost estimate summary for the Vitrification – Joule-heated alternative (VIT1), prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.2.1.I

Cost Estimate Summary for

Vitrification – Joule-heated

CONTROL EST. .TE SUMMARY

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE N: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 19-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	RISK	LABOR	S/C	MAT'L	EQUIP	TOTAL		
1	PRE-MOBILIZATION	1	LOT								678,000				$678,000	C	% / X
2	CAPITAL Direct/ Indirect Field Cost	1	LS								10,593,293	9,482,100	7,014,010	25,109,710	$52,199,113	C	
3	CONSTRUCTION Management	1	LS								3,178,000				$3,178,000	F	
4	ENGINEERING	1	LS									25,050,900			$25,050,900	C	
5	RISK BUDGET for Capital 16%	1	LS							13,029,300					$13,029,300	C	
6	DECONTAMINATION/ DEMOLITION	1	LS									12,753,600			$12,753,600	C	
7	TTA/ RCS (Case B) D & D	1	LS									10,575,500			$10,575,500	C	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
	SUB-TOTAL - ALL PAY ITEMS	1	LS							13,029,300	14,449,293	57,862,100	7,014,010	25,109,710	$117,464,410		
21	Labor FDF - Operations	4.0	YR								73,031,290				$73,031,290	F	
22	Waste Disposal (PKG & Transport)	2,398	CNT									5,035,800	16,299,450		$21,335,250	F	
22.a	Secondary Waste to OTHER	1	LS									576,690			$576,690	C	
23	Project Management FDF	1	LOT								21,315,800		830,000		$22,145,800	F	
	SUB-TOTAL - FDF SUPPORT ITEMS	1	LS								94,347,090	5,612,490	17,129,450		$117,089,030		
24	Start-up testing	1	YR									2,109,000			$2,109,000	C	
25	UTILITY	4.0	YR										5,917,380		$5,917,380	C	
26	SPARE PARTS	4.0	YR										1,192,440		$1,192,440	C	
27	Health Physics	4.0	YR								971,800		2,818,600		$3,790,400	C/F	
28	Subcontractor Oversight (ops & Maint)	1	YR									1,439,870			$1,439,870	C	
29	Supplies	4.0	YR										4,835,170		$4,835,170	C	
30	RISK BUDGET 33.0%	1	LS							40,479,120					$40,479,120	C	
	SUB-TOTAL - OPERATION/ MAINT ITEMS	1	LS							40,479,120	971,800	3,548,870	14,763,590		$59,763,380		
	TOTAL CONTRACTOR COSTS OF MONEY											45,574,610			$45,574,610		
	TOTAL CONTRACTOR COSTS - FY99 $'s									53,508,420	109,768,183	112,598,070	38,907,050	25,109,710	$339,891,430		
31	NTS DISPOSAL FEE w/ 6% risk	1	LS							840,820		14,013,585			$14,854,410	D	
	TOTAL PROJECT COST	1	LOT							54,349,240	109,768,183	126,611,655	38,907,050	25,109,710	$354,745,800		

C: CONTRACTOR F: FLUOR DANIEL FERNALD G: GCBCTC LABOR D: DOE %: PERCENTAGE of VARIABLE TOTALS T: TIME DEPENDANT V: VOLUME DEPENDANT O: OPERATING EFFIC. APPLIED W: WEIGHT X: FIXED COST

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C.2.2 Capital Cost Estimate Basis: Vitrification – Joule-heated

C.2.2.1 Introduction

The capital cost estimate for the Vitrification – Joule-heated alternative (VIT1) is summarized in **Table C.2.2-1**.

The capital costs of the VIT1 alternative were prepared as detailed estimates based on the equipment list, process and mechanical equipment data sheets, single-line electrical diagrams, architectural sketches, and the plot plan provided in the **Design Basis and Description (Appendix G)** for this alternative.

TABLE C. 2.2-1
CAPITAL COST ESTIMATE FOR VITRIFICATION — JOULE-HEATED

Section	Cost Element	Estimated Cost
C.2.2.2.4.1	Pre-Mobilization	$678,000
C.2.2.2.4.2	Direct Field Cost (DFC)	$34,618,013
C.2.2.2.4.3	Indirect Field Cost (IFC)	$17,581,100
C.2.2.2.4.4	Construction Management	$3,178,000
C.2.2.2.4.5	Risk Budget	$13,029,300
C.2.2.1	Total Capital Cost	$69,084,413

C.2.2.2 Estimate Basis

The cost estimate basis for the capital cost of the Vitrification — Joule-heated alternative is comprised of the following six sections (**Sections C.2.2.2.1** through **C.2.2.2.6**):

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.2.2.2.1 Assumptions

The following general assumptions were used in the preparation of the estimates:

1. Costs are expressed in second quarter, 1999 U.S. dollars.
2. Labor costs are based on a 4-day/week, 10-hour(hr)/day, 40-hr work week with an adequate supply of skilled labor available in the area.
3. Mission changes, or major rework does not occur during the engineering, procurement, and construction phases of the project.
4. Machinery, equipment, and bulk materials are purchased in the U.S.
5. Engineered machinery and equipment pricing is obtained engineering specialists and includes freight to the jobsite.
6. Bulk material pricing is estimated by using in-house material pricing data.
7. A site productivity multiplier of 1.186 is applied to estimated, installation manhours (mhr).
8. A sales tax of 6% is applied to estimated equipment and material dollars.
9. Freight is estimated at 2.5% of equipment and material dollars.

C.2.2.2.2 Inclusions

The capital cost estimate includes the costs of the Vitrification – Joule-heated equipment, process equipment, utility equipment, and the associated buildings and structures.

C.2.2.2.3 Exclusions

The following elements of cost are excluded from the capital cost estimate:

- Silos 1 and 2 material retrieval;
- Silo 3 material retrieval and remediation;
- Capital, start-up, and operating spare parts;
- Start-up costs;
- Expense funded costs;
- Operating costs; and
- D&D costs.

C.2.2.2.4 Format and Coding

The VIT1 capital cost estimate is compiled and summarized into the following cost centers:

- Pre-mobilization;
- Direct field;
- Indirect field;
- Construction management;
- Risk budget; and
- Contingency.

The following discussion briefly describes each cost center.

C.2.2.2.4.1 Pre-mobilization Costs

Pre-mobilization costs are the costs for the development and issuance of project documentation and planning.

C.2.2.2.4.2 Direct Field Costs

Direct field costs (DFC) include the costs for the direct construction of the Vitrification — Joule-heated full-scale treatment facility. These costs include craft labor, bulk materials, machinery, and equipment. The FS estimates are further summarized into the following primary, DFC code accounts:

A/C 0 - Excavation and Civil Works
A/C 1 – Concrete
A/C 2 – Structural Steel
A/C 3 – Architectural
A/C 4 – Machinery and Equipment
A/C 5 – Piping
A/C 6 – Electrical
A/C 7 – Instrumentation and Control Systems
A/C 8 – Paint and Insulation
A/C AA- Mobilization

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The DFCs for the machinery, equipment, and electrical accounts are broken down into the following systems:

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- 15 – Feed Preparation
- 16 – Processor Feed
- 17 – Processor
- 18 – Process Off-gas
- 20 – Radon Control
- 23 – Product Forming and Handling
- 25 – Container Receipt and Handling
- 26 – Product Recycle
- 30 – High Voltage
- 31 – 480 volts (V) Distribution
- 32 – Standby Power
- 33 – Uninterruptible Power System (UPS)
- 40 – Plant and Instrument Air
- 41 – Breathing Air
- 44 – Product Additive
- 50 – Process Water
- 51 – Portable Water
- 52 – Fire Water
- 53 – Cooling Water
- 61 – Non-Radioactive Waste
- 63 – Laboratory Waste
- 64 – Radioactive Waste
- 73 – Waste Processing Building Heating, Ventilation and Air Conditioning (HVAC)
- 75 – Analytical Laboratory HVAC
- 76 – Maintenance and Warehouse Facilities HVAC
- 77 – Miscellaneous Facilities HVAC
- 80 – Maintenance Equipment
- 82 – Remote Handling Equipment
- 83 – Radiation (RAD) Shielding Equipment
- 84 – Sampling
- 85 – Closed-circuit Television (CCTV)
- 93 – Health Protection
- 94 – Analytical Laboratory

C.2.2.2.4.3 Indirect Field Costs

Indirect field costs (IFC) are the supporting costs for direct construction effort. These costs include the following:

- Construction supervision;
- Small tools and consumble supplies;
- Construction equipment rental;
- Temporary construction facilities;
- Temporary utilities;
- Job clean-up;
- Safety training;
- Health physics;
- CERCLA;
- General Employee Training (GET)/site access & job specific training;
- Payroll burdens and benefits;
- Overhead and profit;
- Bond; and
- Sales tax.

C.2.2.2.4.4 Construction Management Costs

Construction management costs are the costs for support of construction activities that occur at the FEMP. This costs includes construction management labor costs for managing and coordinating construction activities at the FEMP, and the costs for hooking up and supporting construction temporary trailers, supplies, and utilities.

C.2.2.2.4.5 Risk Budget

This is an allowance for risks and uncertainties associated with the construction of the plant.

C.2.2.2.5 Methodology

The assumptions, MTO allowances, and methods used to prepare the capital cost estimate are discussed next.

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Premobilization

The premobilization costs are activity-based level-of-effort support estimates.

Direct Field Costs

Civil Work

Neat quantities are taken off, a slope of 1.8 to 1 is assumed in all excavation 5'0" below-grade, and a 15% swell factor is used to backfill quantities. Since excavated soils is assumed suitable for backfill, imported backfill material is not included. A disposal site is assumed to be located within one-half mile from the construction site.

Concrete

Neat quantities are taken off and rounded to the nearest ten yards. Fluor standard all-in unit rates per calendar year (CY) are applied to the MTO quantities. The all-in rates include the price of concrete, formwork, reinforcing steel, and embedded accessories. Concrete material pricing is developed from current in-house information.

Structural Steel

Steel quantities are taken off and rounded to the nearest ton. A MTO allowance ranging from 5 to 10 percent is applied:

- Light- Qty + 10%
- Medium- Qty + 7.5%
- Heavy- Qty + 5%
- Siding/Decking Qty + 10%

Steel material pricing is developed from current in-house information.

Architectural

Architectural quantities are developed from the building plan and elevation drawings, and rounded. Unit rates of installation are developed for the various architectural construction tasks. Material pricing is developed from the current in-house information. Various MTO allowances ranging from 1 to 10% are applied to quantities, depending on the type of architectural material.

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The estimate contains the following buildings:

- Waste Process Building 31,520 SF
- Analytical Laboratory 3,024 SF
- Warehouse 9,600 SF
- Mechanical/Electrical Building 5,100 SF
- Control Room 720 SF
- Additive Bin Storage Facility 3,006 SF
- On-site Storage Building 25,480 SF

HVAC Ductwork

Ductwork is estimated by pounds per square feet (lb/ft^2) of building area. All ductwork related items are estimated as a percentage of the ductwork cost:

Description	Installation mhr	Material
duct	lb x .057 mhr/lb	$2.14
dampers	15% duct mhr	15% duct matl$
accessories	7% duct mhr	7% duct matl$
supports	20% duct mhr	20% duct matl$
insulation	17% duct mhr	17% duct matl$
test and balance	25% duct mhr	N/A

HVAC equipment is included in the machinery and equipment A/C estimate.

Machinery and Equipment

The machinery and equipment pricing is developed by Engineering from informal vendor quotes and in-house pricing. The pricing includes freight to the jobsite. The equipment installation rates are developed from in-house data, or crew size, duration estimates. The installation mhrs include the setting and testing of the equipment. Routine maintenance is included in the installation rates on an annual basis.

Piping

The piping estimate is developed using two methods: MTO and factoring.

Take-off allowances are made for the following systems:

- Contaminated water (double encased line from the sumps to its tank).
- Potentially contaminated water (line from the sumps to its tank).
- Fire water loop, hydrants, and branches to the buildings.
- New stormwater system line involving the relocation of an existing line, and the installation of new high density polyethylene (HDPE).
- Feed lines to the additive storage bins.

Allowances for pipe valves are developed as follows:

- Pumps are assigned 3 ea. – ½" gate (drain) valves.
- Tanks are assigned 2 ea. – 2", 2 ea. - ¾" and 1 ea. – ½" gate (gauge & drain) valve.

Piping costs were factored for the remaining process and utility systems, based on the equipment costs. The factors are based on prior estimates of similar waste processing facilities.

Electrical

The electrical estimate is developed using both a MTO approach and factoring. MTOs for power distribution are prepared by the process/utility system, based on the power load requirements shown in the equipment list and one-line diagrams. A factored approached is taken to develop the remaining electrical bulk wiring for the non-process instruments connect to the DCS, and additional melter wiring requirements. The factors are based on similar waste processing facility estimates. Building lighting and communications estimates are derived on a cost per square feet basis. Area lighting for the plot and building grounding is taken off based on the current plot plans.

Instrumentation

The instrumentation estimate is developed using a combination of take-off and factoring methods. Engineering provides a priced process system instrument list. Conceptual process diagrams are used as a basis to take off the local instrumentation. An allowance for isokinetic monitoring is added for the off-gas and the HVAC stacks. Leak detection is added for the double encased contaminated water lines. An allowance for HVAC controls is added based on the HVAC equipment list. The remaining instrument for the utility systems is factored in lieu of instrument diagrams. The factors are developed based on similar waste processing facility estimates.

Paint

The painting estimate is derived using take-off, allowances, and factoring methods. A MTO approach is used to calculate paint requirements for architectural drywall, doors, concrete floors, wall and ceilings, and tanks and stacks. Paint for pricing is factored with the pipe from the equipment account.

Insulation

The insulation estimate is developed using a take-off approach for architectural insulation, and a factored approach for piping and HVAC duct work requirements.

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Indirect Field Costs

Construction Supervision

This cost includes the following contractor support staff:

- General Superintendent,
- Superintendent,
- Assistant Superintendent,
- Office Administrator,
- Labor Relations,
- Job Coordinator,
- Safety Engineer,
- Field Office and Material Manager,
- Time and Material Supervisor,
- Chief Timekeeper,
- Field Project Accountant,
- Cost Estimator,
- Civil Engineer,
- Construction Warehouseman,
- Time Keeper,
- Material Man, and
- Construction Accounting Clerk.

Construction supervision is estimated at 17% of direct field labor dollars.

Small Tools and Consumables

The cost of small tools and consumables is estimated at 6% of direct field labor dollars and provides for items valued at $500 or less.

Equipment Rental

This cost includes smaller light construction equipment used during the construction phase of the project. This cost excludes large cranes, which are specifically defined on the construction estimate. Equipment rental is estimated at $3.50 per direct field labor mhrs.

Temporary Facilities

This cost includes temporary buildings/sheds/trailers and warehouses used during construction. It is estimated at 6% of direct field labor dollars (split 50% to indirect labor, 50% to indirect material).

Job Clean-up

This cost includes housekeeping of site/work areas to maintain a safe, clean work environment. Clean up is estimated at 6% of direct field labor dollars (split 75% to indirect labor, 25% to indirect material).

Safety

This cost includes expenses for contractor joist safety meetings and supplies. Safety is estimated at 3% of direct field labor dollars (split 65% to indirect field labor, and 35% to indirect field material).

Health Physics

This cost includes RAD checks, workers' physicals, participation in drug screening, and material costs associated with personal protective equipment (PPE). Health physicals are estimated on a cost per full-time equivalent (FTE) manpower basis.

CERCLA/SAT

This cost includes site access and RAD training. It is estimated on a cost per FTE basis.

Payroll Burdens and Benefits

This cost includes Federal Insurance Contributions Act (FICA) payments, Federal Unemployment Insurance (FUI), State Unemployment Insurance (SUI), union benefits, and disability. Payroll burdens and benefits are calculated at 57% of the sum of direct and indirect field (labor dollars).

Overhead and Profit

This cost includes the contractor's overhead and profit. It is estimated at 20% of direct and IFC.

Bond

This is the contractor's cost to bond the project; it is estimated at 1% of total direct and IFC.

Sales Tax

This cost is calculated as 6% of the total material cost (direct and indirect).

Construction Management

This cost is calculated at 30% of the direct and indirect labor cost.

Risk Budget

Cost risk analysis for capital cost is 16.2%, which is based on the capital risk analysis for the AWR and Silo 3 projects.

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C.2.2.2.6 References

Basis of Design and Description (Appendix G).

C.2.2.2.7 Attachment

The capital cost estimate summary for the Vitrification — Joule-heated alternative (VIT1), prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.2.2.I

Capital Cost Estimate Summary for

Vitrification – Joule-heated

CONTROL ES. .ATE SUMMARY

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE N: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	DETAIL - ITEM NO. 1	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
001	PRE-MOBILIZATION																
	DOCUMENTATION																
	(Fm. Pre-mob to thru De-mob.) (100% Paymnt. upon receipt)																
	FDF AUTHORIZATION to MOBILIZE																
	HEALTH & SAFETY PROGRAM																
	- Accident Prevention Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	- Respirator Program	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	- Heat & Cold Stress Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Substance Abuse Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Fall Protection Plan	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- MSDS Documentation	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	LABOR RELATIONS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WORK FORCE UTILIZATION PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SAFETY ASSESSMENT (CONST.)	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	TURNOVER PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SYSTEM OPERABILITY TEST REPORT	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WASTE MANEGMENT PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	HAZOP's REVIEW & REPORT	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	CONSTRUCTION ACCEPTANCE TESTS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	TRAINING OF PERSONNEL (Prior to Site Acce	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFETY BASIS ASSESSMENT -																
	- Documentation - 6 mo.	1	LS	1040.0	1,040	$75.00					$78,000				$78,000	C	
	- Calculation - 12 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	- PHA - 2 x 6 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	FDF AUTHORIZATION to OPERATE																
	OPERATIONS PROCEDURES	1	LS	1200.0	1,200	$75.00					$90,000				$90,000	C	
	INSPECTIONS & PERIODIC MAINTENANCE P	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	OPERATIONS SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	STANDING ORDERS MANUAL	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	LESSONS PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	
	OPERATOR TRAINING PROGRAM PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000		
	OPERATIONS & MAINTENANCE PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	

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CONTROL ES. .ATE SUMMARY

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE N: 4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	DETAIL - ITEM NO. 1	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
001																	
	CONTRACTORS SUBMITTALS																
	Project Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Engineering Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Configuration Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Records Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	System Eng. Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Independ. saftey Review Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Procurement Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Contingency Plan & Emerg. Response	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Environmental Control Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
																C	
	Sampling Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Quality Assurance Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Schedules	1	LS	1060.0	1,060	$75.00					$79,500				$79,500	C	
																C	
	TO[illegible]ST ITEM NO. 1	1	LOT								$678,000				$[illegible]		

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ESTIMATE SUMMARY SHEET

FLUOR DANIEL FERNALD

8113

PROJECT:	Silos 1 & 2 Joule Heated Vitrify (FS)	DATE:	05-Nov-99
ESTIMATE NO.:	C4981003	ESTIMATOR:	J. ELLIS
CLIENT:	DOE	LOCATION:	FERNALD
WBS NO.:	2.1.3.G.P	TASK NO.:	4S11B

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO. 2	AAA - Mobilization	800		$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities	8,814		$193,693		$111,950	$9,800	$315,443
	100 - Concrete All Facilities	63,595		$1,349,500		$872,100		$2,221,600
	200 - Structural Steel- All Facilities	16,263		$368,800		$960,300		$1,329,100
	300 - Architectural/Buildings/Finishes-All Fac	31,025		$664,200		$1,249,000		$1,913,200
	400 - Equipment Systems 15 - 94	25,431		$625,400			$21,335,200	$21,960,600
	500 - Piping	11,635		$285,800		$368,600		$654,400
	600 - Electrical	58,136		$1,226,700		$940,760	$1,537,510	$3,704,970
	700 - Instrumentation	5,061		$110,200		$1,376,200		$1,486,400
	800 - Paint / Insulation	9,504		$210,800		$91,900		$302,700
DIRECT FIELD COSTS TOTAL		230,264	$22.13	$5,095,093	$669,600	$5,970,810	$22,882,510	$34,618,013
SUPERVISION - CONTRACTOR		39,146		$866,200				$866,200
SMALL TOOLS & CONSUMABLES						$305,700		$305,700
MISC. EQUIP. RENTAL							$805,900	$805,900
TEMPORARY FACILITIES		6,908		$152,900		$152,900		$305,800
TEMPORARY UTILITY HOOK-UP		4,490		$99,400		$53,500		$152,900
JOB CLEAN-UP		10,362		$229,300		$76,400		$305,700
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)								
HEALTH PHYSICS S/C		8,424		$186,400		$57,700		$244,100
HCLA - 40 HRs/FTE		3,100		$68,600				$68,600
GET/SITE ACCESS & JOB SPECIFIC TRAINING		2,232		$49,400				$49,400
PAYROLL BURDENS & BENEFITS		-	-	$3,846,000				$3,846,000
OVERHEAD & PROFIT		-	-		$8,313,700			$8,313,700
BOND		-	-		$498,800			$498,800
SALES TAX		-	-			$397,000	$1,421,300	$1,818,300
INDIRECT FIELD COSTS TOTAL		74,662		$5,498,200	$8,812,500	$1,043,200	$2,227,200	$17,581,100
DIRECT & INDIRECT FIELD COSTS TOTAL ITEM NO. 2		304,926	$34.74	$10,593,293	$9,482,100	$7,014,010	$25,109,710	$52,199,113
WASTE DISPOSITION MGMT. - FD FERNALD								
OFF-SITE DISPOSAL COSTS (Commercial)								
WASTE MANAGEMENT COSTS TOTAL								
PROJECT MANAGEMENT - FD FERNALD								
CONSTRUCTION MANAGEMENT - FD FERNALD				$3,178,000				$3,178,000
FD FERNALD FIELD SUPPORT COSTS TOTAL ITEM NO.3				$3,178,000				$3,178,000
ENGINEERING/DESIGN/INSPECTION - FD FERNALD								
ENGINEERING/DESIGN/INSPECTION - A/E					$25,050,900			$25,050,900
ENGINEERING COSTS TOTAL ITEM NO. 4					$25,050,900			$25,050,900
SALES TAX - FD FERNALD								
SUB-TOTAL (BASE ESTIMATE)								$80,428,000
RISK BUDGET	16.2%	ITEM NO. 5						$13,029,300
TARGET ESTIMATE		(FY 99 DOLLARS)						$93,457,300
CONTINGENCY	8.0%							$6,434,200
BURIAL FEE								

ESTIMATE PERFORMED BY ESTIMATING SERVICES F:\123R5W\C498103U.WK4

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY CAPITAL ITEM NO.2	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	AAA - Mobilization				800						$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities				8,814						$193,693		$111,950	$9,800	$315,443
	100 - Concrete All Facilities				63,595						$1,349,500		$872,100		$2,221,600
	200 - Structural Steel- All Facilities				16,263						$368,800		$960,300		$1,329,100
	300 - Architectural/Buildings/Finishes-All Fac				31,025						$664,200		$1,249,000		$1,913,200
	400 - Equipment Systems 15 - 94	Rev 09/21/99			25,431						$625,400			$21,335,200	$21,960,600
	500 - Piping				11,635						$285,800		$368,600		$654,400
	600 - Electrical				58,136						$1,226,700		$940,760	$1,537,510	$3,704,970
	700 - Instrumentation				5,061						$110,200		$1,376,200		$1,486,400
	800 - Paint / Insulation				9,504						$210,800		$91,900		$302,700
	Note: The Process, Utility and Electrical Equipment Estimates are based on the Equipment List dated 09-21-99.														
	Subtotal Direct Cost	1	LOT		230,264	$22.13					$5,095,093	$669,600	$5,970,810	$22,882,510	$34,618,013

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	A. RECEIVING & LAYDOWN AREAS														
	1. for EQUIPMENT - 150' x 150' x 1'														
	i. Subgrade Pavement Base	2,500	SY	0.016	47	20.27	0.38			0.68	$950			$1,690	$2,640
	ii. Base Course, 12" deep	2,500	SY	0.017	50	20.27	0.40		8.05	0.52	$1,010		$20,130	$1,310	$22,450
	iii. Stabilization Fabric, 6 oz.	2,500	SY	0.030	89	20.27	0.72		2.45	0.12	$1,800		$6,130	$300	$8,230
	iv. Penetration crushed stone, 4" thk	2,500	SY	0.020	59	20.27	0.48		1.46	0.02	$1,200		$3,650	$50	$4,900
	2. extension of utilities														
	i. Tie-in water supply	1	LS	80.00	95	20.27	1930.00		500.00	2180.00	$1,930		$500	$2,180	$4,610
	ii. Tie-in electrical system	1	LS	80.00	95	20.27	1930.00		500.00	1500.00	$1,930		$500	$1,500	$3,930
	iii. Subgrade pavement base	225	SY	0.016	4	20.27	0.36		2.45	0.12	$80		$550	$30	$660
	iv. Base Course 12" deep	225	SY	0.017	5	20.27	0.44		1.46	0.02	$100		$330		$430
	B. RELOCATE EXISTING ITEMS														
	i. Subgrade Pavement Base	1,000	SY	0.016	19	20.27	0.39			0.68	$390			$680	$1,070
	ii. Base Course, 12" deep	1,000	SY	0.017	20	20.27	0.41		8.05	0.52	$410		$8,050	$520	$8,980
	iii. Stabilization Fabric, 6 oz.	1,000	SY	0.003	4	20.27	0.08		2.45	0.12	$80		$2,450	$120	$2,650
	iv. Penetration crushed stone, 4" thk	1,000	SY	0.002	2	20.27	0.04		1.46	0.02	$40		$1,460	$20	$1,520
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	C. STORMWATER MANAGEMENT														
	1. WASTE PREP BLDG.														
mD	i. Excav. footings,Piers,gradebeams	234	BCY	0.34	80	28.68	9.80			1.28	$2,294			$300	$2,594
mD	ii. Backfill footings,Piers,gradebeams	409	ICY	0.22	90	26.76	5.89			0.98	$2,409			$400	$2,809
	iii. Haul excess to stockpile	156	LCY	0.48	75	22.94	11.03			1.92	$1,721			$300	$2,021
mD	iv. Excav. Interior Wall footings	120	BCY	0.33	40	23.75	7.92			0.83	$950			$100	$1,050
mD	v. Backfill Interior Wall Footings	87	ICY	0.37	32	25.00	9.20			1.15	$800			$100	$900
	vi. Haul excess to stockpile	50	LCY	1.14	57	22.81	26.00			4.00	$1,300			$200	$1,500
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		1,103	$33.90					37,393		43,750	9,800	$90,943

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Civil & Excavation All Facilities														
	D. Prod., Whse., Mech/Elect. Bldg.														
D	1. Excavate area	16445	CY	0.11	2145	20.27					$43,480				$43,480
D	2. Backfill and compact area	13626	CY	0.15	2423	20.27					$49,110				$49,110
D	3. Install vapor barrier	73565	SF	0.008	698	20.27			0.09		$14,150		$6,790		$20,940
D	4. Haul and dump	5234	CY	0.08	496	20.27					$10,050				$10,050
D	5. Grade, scarify & compact site	19845	SY	0.03	682	20.27					$13,820				$13,820
D	6. Rough grade & compact for roads	3044	SY	0.04	137	20.27					$2,780				$2,780
D	7. Spread & compact crushed rock	3044	SY	0.02	61	20.27			2.40		$1,240		$7,490		$8,730
D	8. Install asphalt for roads	2454	SY	0.03	73	20.27			8.16		$1,480		$20,530		$22,010
D	9. Repair shoulder of roads	590	SY	0.02	14	20.27					$280				$280
D	10. Final site grading	8920	SY	0.01	127	20.27					$2,570				$2,570
D	11. Install crushed rock for site	8920	SY	0.02	180	20.27			2.40		$3,650		$21,940		$25,590
D	12 Sand bedding	335	CY	0.75	298	20.27					$6,040				$6,040
D	13 Catch basins	4	EA	48.00	228	20.27			650.00		$4,620		$2,670		$7,290
D	14 C B frame & cover	4	EA	5.00	24	20.27			210.00		$490		$860		$1,350
D	Conc filled barrier posts	50	EA	0.75	44	20.27			66		$890		$3,380		$4,270
D	Fencing	208	LF	0.25	62	20.27			19.33		$1,260		$4,120		$5,380
D	Gates	4	EA	4.00	19	20.27			100.00		$390		$410		$800
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		7,711	$20.27					156,300		68,200		$224,500

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	100 - Concrete All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	CONCRETE														
	A. Prod.,Whse.,Mech/Elect. Bldg.														
D	1. Install slab on grade	2306	CY	3.7	10116	21.22			85.4		$214,660		$201,860		$416,520
D	2. Install walls	878	CY	12.2	12700	21.22			176.3		$269,490		$158,660		$428,150
D	3. Install structural footings	626	CY	6.7	4973	21.22			109.7		$105,530		$70,390		$175,920
D	4. Install continuous footings	515	CY	5.1	3114	21.22			113.40		$66,080		$59,860		$125,940
D	5. Install equipment foundations	245	CY	8.2	2382	21.22			105.60		$50,550		$26,520		$77,070
D	6. Grout area	330	CF	1.0	391	21.22			3.25		$8,300		$1,100		$9,400
D	7. Tilt-up walls	46199	SF	0.24	13146	21.22			3.61		$278,960		$170,950		$449,910
D	8. Install elevated slab	218	CY	12.5	3231	21.22			181.50		$68,560		$40,560		$109,120
D	9. Install fabricated cover blocks	12	EA	36	517	21.22			633		$10,970		$7,790		$18,760
D	10. Erect. cover blocks	12	EA	9	123	21.22					$2,610				$2,610
D	11. Columns for modular walls	555	CY	18.7	12305	21.22			224.80		$261,110		$127,880		$388,990
D	12. Install concrete for cooling tower	10	CY	11.9	141	21.22			142.44		$2,990		$1,460		$4,450
D	13. Install wire mesh for cooling tower	18	SF	0.1	2	21.22			3.25		$40		$60		$100
D	Install lumber for cooling tower	150	BF	0.0	4	21.22			0.38		$80		$60		$140
D	Install embedded bolts	132	EA	0.650	102	21.22			5.85		$2,160		$790		$2,950
	HVAC STACK														
D	15. Structural footings	12	CY	6.70	95	21.22			109.70		$2,020		$1,350		$3,370
D	16. Stack base	3	CY	8.20	29	21.22			105.60		$620		$320		$940
D	17. Install guy anchors	12	CY	8.20	117	21.22			105.60		$2,480		$1,300		$3,780
D	duct footings	11	CY	8.20	107	21.22			105.60		$2,270		$1,190		$3,460
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		63,595	$21.22					1,349,500		872,100		$2,221,600

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DETAIL ESTIM... WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	200 - Structural Steel- All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
-2															
	STRUCTURAL STEEL														
D	1. Install metal roofing	37615	SF	0.008	357	22.68			0.72		$8,100		$27,760		$35,860
D	2. Install light steel	157.25	TON	25.0	4661	22.68			1750.00		$105,710		$282,070		$387,780
D	3. Install medium steel	121	TON	22.0	3156	22.68			1510.00		$71,580		$187,280		$258,860
D	4. Install heavy steel	132	TON	19.0	2973	22.68			1340.00		$67,430		$181,300		$248,730
D	5. Install crane rails	2.1	TON	12.0	30	22.68			880.00		$680		$1,890		$2,570
D	6. Install checkered plate	1002	SF	0.11	131	22.68			5.92		$2,970		$6,080		$9,050
D	7. Install ladders	416	LF	0.64	316	22.68			56.50		$7,170		$24,090		$31,260
D	8. Install stairs	207	Riser	2.31	567	22.68			87.50		$12,860		$18,570		$31,430
D	9. Install Handrail	237	LF	0.13	35	22.68			13.45		$790		$3,270		$4,060
D	10. Install divits	3	EA	5.00	18	22.68			750.00		$410		$2,310		$2,720
D	11. Install Pre-Enginnered Structure	10800	SF	0.05	640	22.68			5.18		$14,520		$57,340		$71,860
D	12. Install 2-1/2" x'2-1/2" x 1/4" angle iron	150	LF	0.34	60	22.68			3.64		$1,360		$560		$1,920
D	13. Install grating	5260	LF	0.15	935	22.68			8.40		$21,210		$45,290		$66,500
D	14. Install crane rail box beam	11.15	TON	17.30	229	22.68			1657.00		$5,190		$18,940		$24,130
D	15. Install supports for box beam	28	EA	15.00	498	22.68			700.00		$11,290		$20,090		$31,380
D	16. Install crane rail stops	4	PR	4.00	19	22.68			450.00		$430		$1,850		$2,280
D	Install kick plate	237	LF	0.05	33	22.68			3.60		$750		$870		$1,620
D	24. Install sumps	24	EA	26.00	740	22.68			1590.00		$16,780		$39,110		$55,890
	HVAC STACK														
D	20. Install ductwork supports	12	EA	10.00	142	22.68			656.00		$3,220		$8,070		$11,290
D	21. Install ductwork to stack	250	LF	1.11	329	22.68			41.64		$7,460		$10,670		$18,130
D	22. Install Stack structure	12.91	TON	22	340	22.68			1525		$7,710		$20,180		$27,890
D	Install guy wire	1200	LF	0.04	54	22.68			2.16		$1,220		$2,660		$3,880
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		16,263	$22.68					368,800		960,300		$1,329,100

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	300 - Architectural/Buildings/Finishes-All Fac	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
- 2															
	ARCHITECTURAL														
D	1. Install metal stud w/gyp. board	16315	SF	0.051	986	21.41			1.02		$21,110		$17,060		$38,170
D	2. Install vents and drains	48981	SF	0.005	290	21.41			0.35		$6,210		$17,570		$23,780
D	3. Install cleaning agent	1	LOT	25.0	30	21.41			10700		$640		$10,970		$11,610
D	4. Install siding	91750	SF	0.041	4460	21.41			0.86		$95,490		$80,880		$176,370
D	5. Install roof insulation	37615	SF	0.007	312	21.41			0.44		$6,680		$16,960		$23,640
D	6. Install wall insulation	45875	SF	0.005	272	21.41			0.35		$5,820		$16,460		$22,280
D	7. Install membrane roofing	37615	SF	0.025	1115	21.41			1.31		$23,870		$50,510		$74,380
D	8. Install 1/2" fiber board	37615	SF	0.009	401	21.41			0.20		$8,590		$7,710		$16,300
D	9. Install single exterior door 3x7	26	EA	8.00	247	21.41			680.00		$5,290		$18,120		$23,410
D	10. Install double ext. door 6x7	6	EA	14.00	100	21.41			970.00		$2,140		$5,970		$8,110
D	11. Install roll-up door 14' x 14'	9	EA	15.00	160	21.41			14000		$3,430		$129,150		$132,580
D	12. Install single int. door 3x7	40	EA	6.00	285	21.41			280.00		$6,100		$11,480		$17,580
D	13. Install double int. door 6x7	11	EA	12.00	156	21.41			510.00		$3,340		$5,750		$9,090
D	14. Install roof closure	244	LF	0.14	41	21.41			13.15		$880		$3,290		$4,170
D	15. Install bldg. communications	78213	SF	0.03	2782	21.41			0.53		$59,560		$42,490		$102,050
D	16. Block and level trailers	9	LS	50.00	534	21.41			13889		$11,430		$128,130		$139,560
D	17. Coated polyester bldg. cover	28728	SF	0.12	3953	21.41			9.41		$84,630		$276,990		$361,620
D	18. Seal ext. roof, walls, and floor	617	LF	0.22	161	21.41			3.50		$3,450		$2,210		$5,660
D	19. Install skirting around trailer	1356	SF	0.07	111	21.41			1.04		$2,380		$1,450		$3,830
D	20. Fab. and install stairs and ramp	1	LOT	120	142	21.41			1574		$3,040		$1,610		$4,650
D	21. Install Potent. cont. wtr. tnk. shlt.	1	LOT	340.0	403	21.41			14100.0		$8,630		$14,450		$23,080
D	22 Ceiling	100	SF	0.027	3	21.41			0.8		$60		$80		$140
	B.FIRE SPRINKLER SYSTEMS														
D	1. install building sprinklers	74486	SF	0.056	4912	21.41			1.73		$105,170		$132,390		$237,560
	C. H.V.A.C. for all facilities														
D	1. install ductwork galv. stl.	74036	LBS	0.057	5003	21.41			2.14		$107,110		$162,400		$269,510
D	2. install dampers	1	LOT	629	746	21.41			23582		$15,970		$24,170		$40,140
D	3. install accessories	1	LOT	294	349	21.41			11090		$7,470		$11,370		$18,840
D	4. install supports	1	LOT	837	992	21.41			31381		$21,240		$32,170		$53,410
D	5. install insulation	1	LOT	707	838	21.41			26505		$17,940		$27,170		$45,110
D	6. Test and Balance	1	LOT	1047	1241	21.41					$26,570				$26,570
D	13. Install double int. door 10x8		EA	22.0		21.41			975						
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		31,025	$21.41					664,200		1,249,000		$1,913,200

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 15 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Machinery and Equipment														
	System Description														
	Mach. & Equip. (forward from M & E detail)														
D	15 - Feed Preparation	1	LOT	2070.0	2454	24.59				612265	$60,340			$627,570	$687,910
D	16 - Processor Feed	1	LOT	400.0	474	24.59				100980	$11,660			$103,500	$115,160
D	17 - Processor	1	LOT	3300.0	3912	24.59				12300000	$96,200			$12,607,500	$12,703,700
D	18 - Process Offgas	1	LOT	1510.0	1790	24.59				585618	$44,020			$600,260	$644,280
D	20 - Radon Control	1	LOT	500.0	593	24.59				384579	$14,580			$394,190	$408,770
D	23 - Product Forming and Handling	1	LOT	650.0	771	24.59				289400	$18,960			$296,640	$315,600
D	24 - Product Packaging	1	LOT	1490.0	1767	24.59				1113200	$43,450			$1,141,030	$1,184,480
D	25 - Container Receipt and Handling	1	LOT	20.0	24	24.59				41000	$590			$42,030	$42,620
D	26 - Product Recycle	1	LOT	980.0	1162	24.59				684700	$28,570			$701,820	$730,390
D	40 - Plant and Instrument Air	1	LOT	290.0	344	24.59				43500	$8,460			$44,590	$53,050
D	41 - Breathing Air	1	LOT	80.0	95	24.59				217300	$2,340			$222,730	$225,070
D	44 - Product Additive	1	LOT	740.0	877	24.59				242500	$21,570			$248,560	$270,130
D	53 - Cooling Water	1	LOT	490.0	581	24.59				37100	$14,290			$38,030	$52,320
D	61 - Non-Radioactive Liquid Waste	1	LOT	670.0	794	24.59				138400	$19,520			$141,860	$161,380
D	63 - Laboratory Waste	1	LOT	20.0	24	24.59				600	$590			$620	$1,210
D	64 - Radioactive Liquid Waste	1	LOT	830.0	984	24.59				163000	$24,200			$167,080	$191,280
D	73 - Product Handling Building HVAC	1	LOT	1940.0	2300	24.59				925800	$56,560			$948,950	$1,005,510
D	75 - Analytical Laboratory HVAC	1	LOT	305.0	362	24.59				61700	$8,900			$63,240	$72,140
D	76 - Maint. & Whse. Facilities HVAC	1	LOT	240.0	285	24.59				16050	$7,010			$16,450	$23,460
D	77 - Misc. Facilities HVAC	1	LOT	40.0	47	24.59				1600	$1,160			$1,640	$2,800
D	80 - Maintenance Equipment	1	LOT	730.0	865	24.59				253700	$21,270			$260,040	$281,310
D	82 - Remote Handling Equipment	1	LOT	950.0	1126	24.59				825100	$27,690			$845,730	$873,420
D	83 - Radiation Shielding Equipment	1	LOT	1970.0	2336	24.59				311000	$57,440			$318,780	$376,220
D	84 - Sampling	1	LOT	105.0	124	24.59				5100	$3,050			$5,230	$8,280
D	85 - CCTV	1	LOT	780.0	925	24.59				307500	$22,750			$315,190	$337,940
D	93 - Health Protection	1	LOT	50.0	59	24.59				5100	$1,450			$5,230	$6,680
D	94 - Analytical Laboratory Equipment	1	LOT	300.0	356	24.59				1148000	$8,750			$1,176,700	$1,185,450
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		25,431	$24.59					625,400			21,335,200	$21,960,600

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	500 - Piping	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	**PIPING SYSTEMS**														
D	1. Install 1/2" c.s. gate valve	212	EA	1.2	302	24.59			61.5		$7,430		$13,360		$20,790
D	2. Install 3/4" c.s. gate valve	40	EA	1.8	85	24.59			69.75		$2,090		$2,860		$4,950
D	3. Install 2" c.s. gate valve	40	EA	1.7	81	24.59			207.75		$1,990		$8,520		$10,510
D	1. Install 1/2" s.s. gate valve	9	EA	1.30	14	24.59			257.25		$340		$2,370		$2,710
D	2. Install 3/4" s.s. gate valve	6	EA	1.40	10	24.59			316.05		$250		$1,940		$2,190
D	3. Install 2" s.s. gate valve	6	EA	1.90	14	24.59			464.31		$340		$2,860		$3,200
D	Factored bulk piping and valves	1	LOT	5170.0	6130	24.59			127100		$150,740		$130,280		$281,020
	Firewater														
D	1. Install 12" std. wt. cs pipe	1240	LF	0.6	863	24.59			42.65		$21,220		$54,210		$75,430
D	2. Install 8" std. wt. cs pipe	650	LF	0.4	316	24.59			25.71		$7,770		$17,130		$24,900
D	3. Install 4" std. wt. cs pipe	1100	LF	0.2	306	24.59			10.92		$7,520		$12,310		$19,830
D	4. Install hydrants	21	EA	4.0	100	24.59			700.00		$2,460		$15,070		$17,530
D	5. Install 4" gate valves	21	EA	4.0	100	24.59			850.00		$2,460		$18,300		$20,760
D	6. Install 4" post ind. valves	3	EA	8.0	28	24.59			1100.00		$690		$3,380		$4,070
D	7. Install 8" post ind. valves	1	EA	12.0	14	24.59			2750.00		$340		$2,820		$3,160
D	8. Install 12" post ind. valve	1	EA	16.0	19	24.59			5200.00		$470		$5,330		$5,800
D	9. Install valve boxes	21	EA	6.0	149	24.59			325.00		$3,660		$7,000		$10,660
D	1. Install drain line cs-pipe	1500	LF	0.39	699	24.59			8.48		$17,190		$13,040		$30,230
D	13. Install bin loading lines	260	LF	0.53	163	22.68			20.30		$3,700		$5,410		$9,110
D	1 Relocate 30" drain line	150	LF	1.30	231	24.59					$5,680				$5,680
D	2 Install new (HDPE) drain line	300	LF	0.8	293	24.59			67.51		$7,200		$20,760		$27,960
D	3. Install double cont. pipe CS/HDPE	2100	LF	0.69	1718	24.59			14.72		$42,250		$31,680		$73,930
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		11,635	$24.56					285,800		368,600		$654,400

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 · Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	**1. Ltg whse,m/e,interconn,process & add**	56037	SF	0.05	3322	21.12			1.08		$70,160		$62,030		$132,190
D	**6. Install lighting to Additive strge. bin fa.**	17928	SF	0.08	1700	21.12			1.62		$35,900		$29,770		$65,670
D	**3. Ltg anlyl lab,control room & ppe traile**	4248	SF	0.20	1007	21.12			4.30		$21,270		$18,720		$39,990
D	**2. Install electrical bulk for melter**	1	LOT	660.0	782	21.12			5000		$16,520		$5,130		$21,650
D	**3. Install elect. for additional instrument**	1	LOT	80.0	95	21.12			21920		$1,100		$22,470		$23,570
15	Feed Preparation														
D	1. Install 480v pr. & mtr. feeders up to 10hp	11	EA	12.9	168	21.12			181.00		$3,550		$2,040		$5,590
D	2. Install 480v pr. & mtr. feeders 15hp	6	EA	12.9	92	21.12			181.00		$1,940		$1,110		$3,050
D	3. Install 480v pr. & mtr. feeders 40hp	4	EA	13.2	63	21.12			164.00		$1,330		$670		$2,000
D	4. Install start-stop station fac. sealed	22	EA	2.3	60	21.12			120.00		$1,270		$2,710		$3,980
D	5. Install 480v pr. & mtr. feeder 20hp	1	EA	13.2	16	21.12			164.00		$340		$170		$510
D	6. Install 3/4" cond. galv. stl.	8500	FT	0.08	806	21.12			0.95		$17,020		$8,280		$25,300
D	7. Install 1" cond. galv. stl.	2500	FT	0.11	326	21.12			1.44		$6,890		$3,690		$10,580
D	8. Install 3/4"-L-flg. with cover & gasket	170	EA	1.0	202	21.12			9.90		$4,270		$1,730		$6,000
D	9. Install 1"-L-flg. with cover & gasket	50	EA	1.2	71	21.12			14.50		$1,500		$740		$2,240
D	10. Install 3/4" cond. union UNY	68	EA	0.8	64	21.12			7.90		$1,350		$550		$1,900
D	11. Install 1" cond. union UNY	20	EA	1.0	24	21.12			13.40		$510		$270		$780
D	12. Install 3/4" cond. seal "EYS"	19	EA	0.9	20	21.12			10.00		$420		$190		$610
D	13. Install 1" cond. seal "EYS"	6	EA	1.0	7	21.12			13.00		$150		$80		$230
D	14. Install 3/4" cond. hub	19	EA	0.8	18	21.12			4.40		$380		$90		$470
D	15. Install 1" cond. hub	6	EA	1.0	7	21.12			5.20		$150		$30		$180
D	16. Install 3-#14cntrl. wire, str. cu 600v	11400	FT	0.03	365	21.12			0.21		$7,710		$2,450		$10,160
D	17. Install 3 #12w/ #12 grd. power wire	5720	FT	0.04	244	21.12			0.36		$5,150		$2,110		$7,260
D	18. Install 3 #10w/ #10 grd. power wire	3120	FT	0.04	163	21.12			0.48		$3,440		$1,540		$4,980
D	19. Install 3 #6w/ #8 grd. power wire	2080	FT	0.06	145	21.12			0.85		$3,060		$1,810		$4,870
D	20. Install 1/c #14 wire term, 600v	132	EA	0.2	31	21.12			0.20		$650		$30		$680
D	21. Install 1/c #12 wire term, 600v	55	EA	0.2	13	21.12			0.25		$270		$10		$280
D	22. Install 1/c #10 wire term, 600v	30	EA	0.2	7	21.12			0.25		$150		$10		$160
D	23. Install 1/c #8 wire term, 600v	11	EA	0.3	4	21.12			0.90		$80		$10		$90
D	24. Install 1/c #6 wire term, 600v	12	EA	0.4	6	21.12			1.00		$130		$10		$140
D	25. Install 14- #10 mtr. cont. kit, 600v	17	EA	0.5	10	21.12			12.00		$210		$210		$420
D	26. Install 8 - #4 mtr. cont. kit, 600v	5	EA	0.6	4	21.12			21.00		$80		$110		$190
D	27. Install flex cond. conn. assy	88	EA	1.1	115	21.12			14.00		$2,430		$1,260		$3,690
D	28. Install st. stl. box 20"x20"x6" w/term.	4	EA	10.3	49	21.12			630.00		$1,030		$2,580		$3,610

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	29. Install 3/4" galv. ridg. stl. conduit	2300	FT	0.08	218	21.12			0.95		$4,600		$2,240		$6,840
D	30. Install 1" galv. ridg. stl. conduit	500	FT	0.11	65	21.12			1.44		$1,370		$740		$2,110
D	31. Install1-1/2" galv. ridg. stl. conduit	500	FT	0.14	83	21.12			2.30		$1,750		$1,180		$2,930
D	32. Install 2" galv. ridg. stl. conduit	200	FT	0.17	40	21.12			3.08		$840		$630		$1,470
D	33. Install 3/4" "L" ftg. w/cover & gasket	93	EA	1.00	110	21.12			9.90		$2,320		$940		$3,260
D	34. Install 1" "L" ftg. w/cover & gasket	15	EA	1.20	21	21.12			14.50		$440		$220		$660
D	35. Install 1-1/2" "L" ftg. w/cover & gasket	15	EA	2.00	36	21.12			27.00		$760		$420		$1,180
D	36. Install 2" "L" ftg. w/cover & gasket	9	EA	2.50	27	21.12			42.00		$570		$390		$960
D	37. Install 3/4" "T" ftg. w/cover & gasket	102	EA	1.20	145	21.12			11.30		$3,060		$1,180		$4,240
D	38. Install 1" "T" ftg. w/cover & gasket	15	EA	1.50	27	21.12			16.60		$570		$260		$830
D	39. Install 1-1/2" "T" ftg. w/cover & gasket	15	EA	2.50	44	21.12			30.30		$930		$470		$1,400
D	40. Install 2" "T" ftg. w/cover & gasket	15	EA	3.00	53	21.12			46.30		$1,120		$710		$1,830
D	41. Install 3/4" conduit union "UNY"	34	EA	0.80	32	21.12			7.90		$680		$280		$960
D	42. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	43. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	44. Install 2" conduit union "UNY"	10	EA	1.90	23	21.12			34.40		$490		$350		$840
D	45. Install 2" conduit hub	4	EA	1.90	9	21.12			11.00		$190		$50		$240
D	46. Install 2" conduit seal "EYS"	4	EA	1.60	8	21.12			30.20		$170		$120		$290
D	47. Install 1/2" conduit drain	63	EA	0.20	15	21.12			25.00		$320		$1,610		$1,930
D	48. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	9300	FT	0.02	198	21.12			0.23		$4,180		$2,190		$6,370
D	49. Install 1pr-#16 wire termination, 300v	176	EA	0.40	83	21.12			0.30		$1,750		$50		$1,800
D	50. Install power wire, str. 600v, 3#8w/ #10 g	520	FT	0.05	33	21.12			0.60		$700		$320		$1,020
16	Processor Feed														
D	1. Install 480v pr. & mtr. feeders up to 10hp	6	EA	12.9	92	21.12			181.00		$1,940		$1,110		$3,050
D	2. Install start-stop station fac. sealed	6	EA	2.3	16	21.12			120.00		$340		$740		$1,080
D	3. Install 3/4" cond. galv. stl.	2820	FT	0.08	267	21.12			0.95		$5,640		$2,750		$8,390
D	4. Install 3/4" "L" ftg. w/cover & gasket	56	EA	1.00	66	21.12			9.90		$1,390		$570		$1,960
D	5. Install 3/4" conduit union "UNY"	24	EA	0.80	23	21.12			7.90		$490		$190		$680
D	6. Install control wire, str. 600v, 3 #14	2940	FT	0.03	94	21.12			0.21		$1,990		$630		$2,620
D	6. Install 3/4" conduit seal "EYS"	7	EA	0.90	7	21.12			10.00		$150		$70		$220
D	7. Install 3/4" cond. hub	7	EA	0.80	7	21.12			4.40		$150		$30		$180
D	8. Install power wire 3 #12 w/#12 grd.	2940	FT	0.04	125	21.12			0.36		$2,640		$1,080		$3,720
D	9. Install wire term. , 600v, 1/c #14	36	EA	0.20	9	21.12			0.2		$190		$10		$200
D	10. Install wire term. , 600v, 1/c #12	30	EA	0.20	7	21.12			0.25		$150		$10		$160

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DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	11. Install Mtr. cont. kit, 600v, #14 - #10	6	EA	0.50	4	21.12			12.00		$80		$70		$150
D	12. Install flex cond. conn. assy	33	EA	1.1	43	21.12			14.00		$910		$470		$1,380
D	13. Install st. stl. box 20"x20"x6" w/term.	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	14. Install 3/4" galv. ridg. stl. conduit	900	FT	0.08	85	21.12			0.95		$1,800		$880		$2,680
D	15. Install 1" galv. ridg. stl. conduit	200	FT	0.11	26	21.12			1.44		$550		$300		$850
D	16. Install1-1/2" galv. ridg. stl. conduit	180	FT	0.14	30	21.12			2.30		$630		$420		$1,050
D	17. Install 2" galv. ridg. stl. conduit	100	FT	0.17	20	21.12			3.08		$420		$320		$740
D	18. Install 3/4" "L" ftg. w/cover & gasket	36	EA	1.00	43	21.12			9.90		$910		$370		$1,280
D	19. Install 1" "L" ftg. w/cover & gasket	9	EA	1.20	13	21.12			14.50		$270		$130		$400
D	20. Install 1-1/2" "L" ftg. w/cover & gasket	6	EA	2.00	14	21.12			27.00		$300		$170		$470
D	21. Install 2" "L" ftg. w/cover & gasket	3	EA	2.50	9	21.12			42.00		$190		$130		$320
D	22. Install 3/4" "T" ftg. w/cover & gasket	39	EA	1.20	55	21.12			11.30		$1,160		$450		$1,610
D	23. Install 1" "T" ftg. w/cover & gasket	6	EA	1.50	11	21.12			16.60		$230		$100		$330
D	24. Install 1-1/2" "T" ftg. w/cover & gasket	6	EA	2.50	18	21.12			30.30		$380		$190		$570
D	25. Install 2" "T" ftg. w/cover & gasket	9	EA	3.00	32	21.12			46.30		$680		$430		$1,110
D	26. Install 3/4" conduit union "UNY"	14	EA	0.80	13	21.12			7.90		$270		$110		$380
D	27. Install 1" conduit union "UNY"	3	EA	1.00	4	21.12			13.40		$80		$40		$120
D	28. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	29. Install 2" conduit union "UNY"	5	EA	1.90	11	21.12			34.40		$230		$180		$410
D	30. Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	31. Install 2" conduit seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	32. Install 1/2" conduit drain	24	EA	0.20	6	21.12			25.00		$130		$620		$750
D	33. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	3600	FT	0.02	77	21.12			0.23		$1,630		$850		$2,480
D	34. Install 1pr-#16 wire termination, 300v	66	EA	0.40	31	21.12			0.30		$650		$20		$670
17	Processor														
D	1. Install 4" galv. rigid stl. conduit	2220	FT	0.42	1105	21.12			9.50		$23,340		$21,620		$44,960
D	2. Install 4" "LBD" ftg. w/cover & gasket	60	EA	6.5	462	21.12			310.00		$9,760		$19,070		$28,830
D	3. Install 4" conduit union "UNY"	24	EA	3.00	85	21.12			140.00		$1,800		$3,440		$5,240
D	4. Install 4" cond. hub	12	EA	3.00	43	21.12			54.00		$910		$660		$1,570
D	5. Install power wire 3 #500kcm w/#10 grd	2340	FT	0.28	763	21.12			18.90		$16,110		$45,330		$61,440
D	6. Install wire term., 600v, 1/c #2/0	12	EA	0.80	11	21.12			3.20		$230		$40		$270
D	7. Install wire term., 600v, 1/c #750kcm	36	EA	2.00	85	21.12			18.00		$1,800		$660		$2,460
18	Processor Off-gas														
D	1. Install 480v pr. & mtr. feeders up to 10hp	11	EA	12.9	168	21.12			181.00		$3,550		$2,040		$5,590

000061

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	2. Install 480v pr. & mtr. feeders 15hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	3. Install 480v pr. & mtr. feeders 100hp	1	EA	10.1	12	21.12			187.00		$250		$190		$440
D	4. Install start-stop push button station	14	EA	2.30	38	21.12			120.00		$800		$1,720		$2,520
D	Install 3/4" sealt. flex cond. w/2 cont.	5	LOT	0.80	5	21.12			12.05		$110		$60		$170
D	5. Install 3/4" conduit galv. rigid stl.	9100	FT	0.08	863	21.12			0.95		$18,230		$8,860		$27,090
D	6. Install 1-1/2" conduit galv. rigid stl.	550	FT	0.14	91	21.12			2.30		$1,920		$1,300		$3,220
D	7. Install 3/4" "L" ftg. w/cover & gasket	182	EA	1.00	216	21.12			9.90		$4,560		$1,850		$6,410
D	8. Install 1-1/2" "L" ftg. w/cover & gasket	11	EA	2.00	26	21.12			27.00		$550		$300		$850
D	9. Install 3/4" conduit union "UNY"	73	EA	0.80	69	21.12			7.90		$1,460		$590		$2,050
D	10. Install 1-1/2" conduit union "UNY"	4	EA	1.50	7	21.12			26.70		$150		$110		$260
D	11. Install 3/4" conduit seal "EYS"	20	EA	0.90	21	21.12			10.00		$440		$210		$650
D	12. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	13. Install 3/4" conduit hub	20	EA	0.80	19	21.12			4.40		$400		$90		$490
D	14. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	15. Install cntrl. wire str cu 600v, 3 #14	7980	FT	0.03	255	21.12			0.21		$5,390		$1,720		$7,110
D	16. Install power wire 3#12 w/ #12 grd.	7720	FT	0.04	330	21.12			0.36		$6,970		$2,850		$9,820
D	17. Install power wire 3#10 w/ #10 grd.	1140	FT	0.04	59	21.12			0.48		$1,250		$560		$1,810
D	18. Install power wire 3#2/0 w/ #4 grd.	570	FT	0.11	77	21.12			3.18		$1,630		$1,860		$3,490
D	19. Install wire term. 600v, 1/c #14	84	EA	0.20	20	21.12			0.20		$420		$20		$440
D	20. Install wire term. 600v, 1/c #12	60	EA	0.20	14	21.12			0.25		$300		$20		$320
D	21. Install wire term. 600v, 1/c #10	10	EA	0.20	2	21.12			0.25		$40				$40
D	22. Install wire term. 600v, 1/c #4	2	EA	0.40	1	21.12			1.30		$20				$20
D	23. Install wire term. 600v, 1/c #2/0	3	EA	0.80	3	21.12			3.20		$60		$10		$70
D	24. Install mtr. cont. kit, 600V, #14- #10	13	EA	0.50	8	21.12			12.00		$170		$160		$330
D	25. Install mtr. cont. kit, 600V, #2- #4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	26. Install flex cond. conn. assy	48	EA	1.1	63	21.12			14.00		$1,330		$690		$2,020
D	27. Install st. stl. box 20"x20"x6" w/term.	3	EA	10.3	37	21.12			630.00		$780		$1,940		$2,720
D	28. Install 3/4" galv. ridg. stl. conduit	1350	FT	0.08	128	21.12			0.95		$2,700		$1,310		$4,010
D	29. Install 1" galv. ridg. stl. conduit	300	FT	0.11	39	21.12			1.44		$820		$440		$1,260
D	30. Install1-1/2" galv. ridg. stl. conduit	270	FT	0.14	45	21.12			2.30		$950		$640		$1,590
D	31. Install 2" galv. ridg. stl. conduit	120	FT	0.17	24	21.12			3.08		$510		$380		$890
D	32. Install 3/4" "L" ftg. w/cover & gasket	59	EA	1.00	70	21.12			9.90		$1,480		$600		$2,080
D	33. Install 1" "L" ftg. w/cover & gasket	9	EA	1.20	13	21.12			14.50		$270		$130		$400

000062

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	34. Install 1-1/2" "L" ftg. w/cover & gasket	9	EA	2.00	21	21.12			27.00		$440		$250		$690
D	35. Install 2" "L" ftg. w/cover & gasket	5	EA	2.50	15	21.12			42.00		$320		$220		$540
D	36. Install 3/4" "T" ftg. w/cover & gasket	62	EA	1.20	88	21.12			11.30		$1,860		$720		$2,580
D	37. Install 1" "T" ftg. w/cover & gasket	9	EA	1.50	16	21.12			16.60		$340		$150		$490
D	38. Install 1-1/2" "T" ftg. w/cover & gasket	9	EA	2.50	27	21.12			30.30		$570		$280		$850
D	39. Install 2" "T" ftg. w/cover & gasket	8	EA	3.00	28	21.12			46.30		$590		$380		$970
D	40. Install 3/4" conduit union "UNY"	20	EA	0.80	19	21.12			7.90		$400		$160		$560
D	41. Install 1" conduit union "UNY"	9	EA	1.00	11	21.12			13.40		$230		$120		$350
D	42. Install 1-1/2" conduit union "UNY"	9	EA	1.50	16	21.12			26.70		$340		$250		$590
D	43. Install 2" conduit union "UNY"	9	EA	1.90	20	21.12			34.40		$420		$320		$740
D	44. Install 2" conduit hub	3	EA	1.90	7	21.12			11.00		$150		$30		$180
D	45. Install 2" conduit seal "EYS"	3	EA	1.60	6	21.12			30.20		$130		$90		$220
D	46. Install 1/2" conduit drain	35	EA	0.20	8	21.12			25.00		$170		$900		$1,070
D	47. Install 1pr #16 str cu shld. w/ pvc jkt, 300	5200	FT	0.02	111	21.12			0.23		$2,340		$1,230		$3,570
D	48. Install 1pr #16 wire term., 300v	96	EA	0.40	46	21.12			0.30		$970		$30		$1,000
D	Miscellaneuos and support materials sys.18	1	LOT	286.0	286	21.12			3987		$6,040		$4,090		$10,130
D	Miscellaneuos and support materials sys.15	1	LOT	379.0	379	21.12			5315		$8,000		$5,450		$13,450
D	Miscellaneuos and support materials sys. 16	1	LOT	109.0	109	21.12			1561		$2,300		$1,600		$3,900
D	Miscellaneuos and support materials sys. 17	1	LOT	248.0	248	21.12			8734		$5,240		$8,950		$14,190
20	Radon Control														
D	1. Install 480v pr. & mtr. feeders up to 10hp	4	EA	12.9	61	21.12			181.00		$1,290		$740		$2,030
D	2. Install 3/4" flex cond. w/ 2 connctors	1	LOT	0.8	1	21.12			12.05		$20		$10		$30
D	3. Install starter & fused discnt. switch	1	EA	2.3	3	21.12			150.00		$60		$150		$210
D	4. Install start-stop push button station	6	EA	2.30	16	21.12			120.00		$340		$740		$1,080
D	5. Install 3/4" conduit galv. rigid stl.	4000	FT	0.08	379	21.12			0.95		$8,000		$3,900		$11,900
D	6. Install 3/4" "L" ftg. w/cover & gasket	80	EA	1.00	95	21.12			9.90		$2,010		$810		$2,820
D	7. Install 3/4" conduit union "UNY"	32	EA	0.80	30	21.12			7.90		$630		$260		$890
D	8. Install 3/4" conduit seal "EYS"	8	EA	0.90	9	21.12			10.00		$190		$80		$270
D	9. Install 3/4" cond. hub	8	EA	0.80	8	21.12			4.40		$170		$40		$210
D	10. Install power wire 3#12 w/ #12 grd.	2360	FT	0.04	101	21.12			0.36		$2,130		$870		$3,000
D	11. Install power wire 3#10 w/ #10 grd.	1180	FT	0.04	62	21.12			0.48		$1,310		$580		$1,890
D	12. Install wire term. 600v, 1/c #14	36	EA	0.20	9	21.12			0.20		$190		$10		$200
D	13. Install wire term. 600v, 1/c #12	40	EA	0.20	9	21.12			0.25		$190		$10		$200
D	14. Install wire term. 600v, 1/c #10	16	EA	0.20	4	21.12			0.25		$80				$80

000063

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	15. Install mtr. cont. kit, 600V, #14- #10	6	EA	0.50	4	21.12			12.00		$80		$70		$150
D	16. Install cntrl. wire, str. 600v, 3 #14	3540	FT	0.03	113	21.12			0.21		$2,390		$760		$3,150
D	17. Install 480v pr. & mtr. feeders up to 15hp	2	EA	12.90	31	21.12			181.00		$650		$370		$1,020
D	18. Install instr. flex cond. assy.	14	EA	1.10	18	21.12			14.00		$380		$200		$580
D	19. Install stn. stl. box 20" x 20" x 6" w/term.	1	EA	10.30	12	21.12			630.00		$250		$650		$900
D	20. Install 3/4" galv. rigid stl. conduit	380	FT	0.08	36	21.12			0.95		$760		$370		$1,130
D	29. Install 1" galv. ridg. stl. conduit	90	FT	0.11	12	21.12			1.44		$250		$130		$380
D	30. Install1-1/2" galv. ridg. stl. conduit	80	FT	0.14	13	21.12			2.30		$270		$190		$460
D	31. Install 2" galv. ridg. stl. conduit	40	FT	0.17	8	21.12			3.08		$170		$130		$300
D	32. Install 3/4" "L" ftg. w/cover & gasket	15	EA	1.00	18	21.12			9.90		$380		$150		$530
D	33. Install 1" "L" ftg. w/cover & gasket	3	EA	1.20	4	21.12			14.50		$80		$40		$120
D	34. Install 1-1/2" "L" ftg. w/cover & gasket	3	EA	2.00	7	21.12			27.00		$150		$80		$230
D	35. Install 2" "L" ftg. w/cover & gasket	2	EA	2.50	6	21.12			42.00		$130		$90		$220
D	36. Install 3/4" "T" ftg. w/cover & gasket	17	EA	1.20	24	21.12			11.30		$510		$200		$710
D	37. Install 1" "T" ftg. w/cover & gasket	3	EA	1.50	5	21.12			16.60		$110		$50		$160
D	38. Install 1-1/2" "T" ftg. w/cover & gasket	3	EA	2.50	9	21.12			30.30		$190		$90		$280
D	39. Install 2" "T" ftg. w/cover & gasket	3	EA	3.00	11	21.12			46.30		$230		$140		$370
D	40. Install 3/4" conduit union "UNY"	6	EA	0.80	6	21.12			7.90		$130		$50		$180
D	41. Install 1" conduit union "UNY"	3	EA	1.00	4	21.12			13.40		$80		$40		$120
D	42. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	43. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	44. Install 2" conduit hub	1	EA	1.90	2	21.12			11.00		$40		$10		$50
D	45. Install 2" conduit seal "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	46. Install 1/2" conduit drain	10	EA	0.20	2	21.12			25.00		$40		$260		$300
D	47. Install 1pr #16 str cu shld. w/ pvc jkt, 300	1600	FT	0.02	34	21.12			0.23		$720		$380		$1,100
D	48. Install 1pr #16 wire term., 300v	28	EA	0.40	13	21.12			0.30		$270		$10		$280
D	Miscellaneuos and support materials sys.18	1	LOT	107.0	107	21.12			1430		$2,260		$1,470		$3,730
23	Product Forming & Handling														
D	1. Install mtr. flex cond. 480v up to 10hp	11	EA	12.9	168	21.12			181.00		$3,550		$2,040		$5,590
D	2. Install starter & fused discnt. switch	11	EA	2.3	30	21.12			120.00		$630		$1,350		$1,980
D	3. Install 3/4" conduit galv. rigid stl.	3850	FT	0.08	365	21.12			0.95		$7,710		$3,750		$11,460
D	4. Install 3/4" "L" ftg. w/cover & gasket	77	EA	1.00	91	21.12			9.90		$1,920		$780		$2,700
D	5. Install 3/4" conduit union "UNY"	33	EA	0.80	31	21.12			7.90		$650		$270		$920

000064

7-8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	6. Install 3/4" conduit seal "EYS"	12	EA	0.90	13	21.12			10.00		$270		$120		$390
D	7. Install 3/4" cond. hub	12	EA	0.80	11	21.12			4.40		$230		$50		$280
D	8. Install power wire 3#12 w/ #12 grd.	4070	FT	0.04	174	21.12			0.36		$3,670		$1,500		$5,170
D	9. Install wire term. 600v, 1/c #12	88	EA	0.20	21	21.12			0.25		$440		$20		$460
D	10. Install cntrl. wire 600v, 3 #14	4070	FT	0.03	130	21.12			0.21		$2,750		$880		$3,630
D	11. Install wire term. 600v, 1/c #14	66	EA	0.20	16	21.12			0.20		$340		$10		$350
D	12. Install mtr. cont. kit 600v, #14- #10	11	EA	0.50	7	21.12			12.00		$150		$140		$290
D	Miscellaneuos and support materials	1	LOT	90.0	90	21.12			1185		$1,900		$1,210		$3,110
24	Product Packaging														
D	1. Install 3/4" flex cond. w/ 2 connctors	1	LOT	0.8	1	21.12			12.05		$20		$10		$30
D	2. Install start-stop push button station	12	EA	2.3	33	21.12			120.00		$700		$1,480		$2,180
D	3. Install 3/4" conduit galv. rigid stl.	4550	FT	0.08	432	21.12			0.95		$9,120		$4,430		$13,550
D	4. Install 3/4" "L" ftg. w/cover & gasket	91	EA	1.00	108	21.12			9.90		$2,280		$920		$3,200
D	5. Install 3/4" conduit union "UNY"	39	EA	0.80	37	21.12			7.90		$780		$320		$1,100
D	6. Install 3/4" conduit seal "EYS"	14	EA	0.90	15	21.12			10.00		$320		$140		$460
D	7. Install 3/4" cond. hub	14	EA	0.80	13	21.12			4.40		$270		$60		$330
D	8. Install power wire 3#12 w/ #12 grd.	4440	FT	0.04	190	21.12			0.36		$4,010		$1,640		$5,650
D	9. Install wire term. 600v, 1/c #12	96	EA	0.20	23	21.12			0.25		$490		$20		$510
D	10. Install mtr. flex cond. assy up to 10hp	12	EA	12.90	184	21.12			181.00		$3,890		$2,230		$6,120
D	11. Install cntrl wire, 600v, 3 #14	4440	FT	0.03	142	21.12			0.21		$3,000		$960		$3,960
D	12. Install power wire 600v, 3 #8w/ #10 grd	370	FT	0.05	23	21.12			0.60		$490		$230		$720
D	13. Install wire term. 600v, 1/c #14	72	EA	0.20	17	21.12			0.20		$360		$10		$370
D	14. Install disc. switch 30a,600v,3ph.	1	EA	2.30	3	21.12			150.00		$60		$150		$210
D	15. Install wire term. 600v, 1/c #8	6	EA	0.30	2	21.12			0.90		$40		$10		$50
D	16. Install mtr. cont. kit 600v, #14-#10	12	EA	0.50	7	21.12			12.00		$150		$150		$300
D	17. Install wire term. 600v, 1/c #10	3	EA	0.20	1	21.12			0.25		$20				$20
D	Miscellaneuos and support materials	1	LOT	107.0	107	21.12			1390		$2,260		$1,420		$3,680
26	Product Recycle														
D	1. Install 3/4" flex cond. w/ 2 conncectors	2	LOT	0.8	2	21.12			12.05		$40		$20		$60
D	2. Install mtr. flex cond. assy. up to 10hp	4	EA	12.9	61	21.12			181.00		$1,290		$740		$2,030
D	3. Install mtr. flex cond. assy. up to 100hp	1	EA	10.10	12	21.12			187.00		$250		$190		$440
D	4. Install start-stop push buttom station	5	EA	2.30	14	21.12			120.00		$300		$620		$920
D	5. Install 3/4" conduit galv. rigid stl.	2100	FT	0.08	199	21.12			0.95		$4,200		$2,040		$6,240
D	6. Install disc. switch, 30a, 600v, 3ph.	2	EA	2.30	5	21.12			150.00		$110		$310		$420

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	7. Install 1-1/2" conduit galv. rigid stl.	300	FT	0.14	50	21.12			2.30		$1,060		$710		$1,770
D	8. Install 3/4" "L" ftg. w/cover & gasket	42	EA	1.00	50	21.12			9.90		$1,060		$430		$1,490
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	6	EA	2.00	14	21.12			27.00		$300		$170		$470
D	11. Install 3/4" conduit union "UNY"	21	EA	0.80	20	21.12			7.90		$420		$170		$590
D	13. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	14. Install 3/4" conduit seal "EYS"	8	EA	0.90	9	21.12			10.00		$190		$80		$270
D	16. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	17. Install 3/4" conduit hub	8	EA	0.80	8	21.12			4.40		$170		$40		$210
D	19. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	20. Install contrl. wirre 600v, 3 #14	1600	FT	0.03	51	21.12			0.21		$1,080		$340		$1,420
D	21. Install power wire 3#12 w/ #12 grd.	1280	FT	0.04	55	21.12			0.36		$1,160		$470		$1,630
D	22. Install power wire 3#10 w/ #10 grd.	320	FT	0.04	17	21.12			0.48		$360		$160		$520
D	23. Install power wire 3#2/0 w/ #4 grd.	320	FT	0.11	43	21.12			3.18		$910		$1,040		$1,950
D	25. Install wire term. 600v, 1/c #12	23	EA	0.20	5	21.12			0.25		$110		$10		$120
D	26. Install wire term. 600v, 1/c #10	8	EA	0.20	2	21.12			0.25		$40				$40
D	27. Install wire term. 600v, 1/c #14	30	EA	0.20	7	21.12			0.20		$150		$10		$160
D	29. Install wire term. 600v, 1/c #4	2	EA	0.40	1	21.12			1.30		$20				$20
D	30. Install wire term. 600v, 1/c #2/0	3	EA	0.80	3	21.12			3.20		$60		$10		$70
D	31. Install mtr. cont. kit, 600V, #14-#10	4	EA	0.50	2	21.12			12.00		$40		$50		$90
D	33. Install mtr. cont. kit, 600V, #2- #4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	Miscellaneuos and support materials	1	LOT	59.0	59	21.12			852		$1,250		$870		$2,120
30	High Voltage														
D	30-SG-001 Utility substation	1	EA	600.0	711	21.12				300000	$15,020			$307,500	$322,520
D	30-XT-001 Main Transformer	1	EA							w/32-eg-0					
D	3. Install 4" conduit galv. rigid stl.	60	FT	0.42	30	21.12			9.12		$630		$560		$1,190
D	4. Install 4" "LBD" ftg. w/cover & gasket	2	EA	6.50	15	21.12			310.00		$320		$640		$960
D	5. Install 4" conduit union "UNY"	2	EA	3.00	7	21.12			140.00		$150		$290		$440
D	7. Install 4" cond. hub	4	EA	3.00	14	21.12			53.70		$300		$220		$520
D	8. Install power wire 3#2/0 w/ #4 grd.	100	FT	0.20	24	21.12			11.30		$510		$1,160		$1,670
D	9. Install wire term. 600v, 1/c #2	4	EA	0.50	2	21.12			2.45		$40		$10		$50
D	10. Install term. kit 15kv 1/c #4/0	12	EA	2.80	40	21.12			93.00		$840		$1,140		$1,980
D	11. Micellaneous and support materials	1	LOT	10.00	12	21.12			340.00		$250		$350		$600
														307,500	$307,500

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DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	480V Distribution sys. 31														
D	31-MC-001 (MCC)	1	EA	160.00	190	21.12				100000	$4,010			$102,500	$106,510
D	31-MC-002 & 003 (MCC)	2	EA	160.00	379	21.12				70000	$8,000			$143,500	$151,500
D	31-MC-004 (MCC)	1	EA	160.00	190	21.12				100000	$4,010			$102,500	$106,510
D	31-MC-005 (MCC)	1	EA	160.00	190	21.12				70000	$4,010			$71,750	$75,760
D	31-MC-006 (MCC)	1	EA	160.00	190	21.12				60000	$4,010			$61,500	$65,510
D	7. Install mini-power xfmr/panel, 30kva	9	EA	50.00	534	21.12			3000.00		$11,280		$27,680		$38,960
D	8. Install 3" galv. ridgid stl. conduit	640	FT	0.28	212	21.12			6.41		$4,480		$4,200		$8,680
D	9. Install 3" conduit union "UNY"	16	EA	2.50	47	21.12			76.00		$990		$1,250		$2,240
D	10. Install 3" cond. hub	32	EA	2.50	95	21.12			33.30		$2,010		$1,090		$3,100
D	11. Install power wire 3#1/0 grd., 600v	960	FT	0.20	229	21.12			8.18		$4,840		$8,050		$12,890
D	12. Install 3" "LBD" ftg. w/cover & gasket	16	EA	4.50	85	21.12			160.00		$1,800		$2,620		$4,420
D	13. Install wire term. 600v, 1/c #10	32	EA	0.7	27	21.12			2.75		$570		$90		$660
D	14. Install wire term. 600v, 1/c #350kcm	96	EA	1.50	171	21.12			6.20		$3,610		$610		$4,220
D	15. Install 1-1/2" galv. ridg. stl. conduit	40	FT	0.14	7	21.12			2.30		$150		$90		$240
D	16. Install1-1/2" "L" ftg. w/cover & gasket	2	EA	2.00	5	21.12			27.00		$110		$60		$170
D	17. Install 1-1/2" conduit union "UNY"	1	EA	1.50	2	21.12			27		$40		$30		$70
D	18. Install power wire, 600v, 3#4 w/ #8 grd.	60	FT	0.1	5	21.12			1.15		$110		$70		$180
D	19. Install 1-1/2" conduit hub	2	EA	1.5	4	21.12			7.90		$80		$20		$100
D	20. Install wire term. 600v, 1/c #8	2	EA	0.3	1	21.12			0.90		$20				$20
D	21. Install wire term. 600v, 1/c #4	6	EA	0.4	3	21.12			1.30		$60		$10		$70
D	22. Install 2" pvc sch. 40 conduit	1100	FT	0.1	143	21.12			0.77		$3,020		$870		$3,890
D	23. Install 2" rsg. 90 deg. elbow	8	EA	1.2	11	21.12			69.60		$230		$570		$800
D	24. Install 2" conduit union "UNY"	8	EA	1.90	18	21.12			34.40		$380		$280		$660
D	25. Install 2" conduit seal "EYS"	4	EA	1.60	8	21.12			30.20		$170		$120		$290
D	26. Install 2" cond. hub	8	EA	1.90	18	21.12			11.00		$380		$90		$470
D	27. Install power wire 3#4 w/ #8 grd.	1180	FT	0.05	74	21.12			1.15		$1,560		$1,390		$2,950
D	28. Install wire term. 600v, 1/c #8	8	EA	0.30	3	21.12			0.90		$60		$10		$70
D	29. Install wire term. 600v, 1/c #4	24	EA	0.40	11	21.12			1.30		$230		$30		$260
D	30. Install 1-1/2" galv. stl.conduit	1480	FT	0.14	246	21.12			2.30		$5,200		$3,490		$8,690
D	31. Install1-1/2" "L" ftg. w/cover & gasket	60	EA	2.00	142	21.12			27.00		$3,000		$1,660		$4,660
D	32. Install 1-1/2" conduit union "UNY"	21	EA	1.50	37	21.12			26.70		$780		$570		$1,350
D	33. Install 1-1/2" cond. hub	10	EA	1.50	18	21.12			7.90		$380		$80		$460
D	34. Install power wire 3#4 w/ #8 grd.	1580	FT	0.07	127	21.12			1.15		$2,680		$1,860		$4,540
D	35. Install wire term. 600v, 1/c #8	10	EA	0.30	4	21.12			0.90		$80		$10		$90

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	36. Install wire term. 600v, 1/c #4	30	EA	0.40	14	21.12			1.30		$300		$40		$340
D	37. Install machine trenching	276	CY	0.30	98	21.12					$2,070				$2,070
D	38. Install backfill	209	CY	0.40	99	21.12					$2,090				$2,090
D	39. Load, haul & dump	110	CY	0.10	13	21.12					$270				$270
D	40. Install concrete ductbanks, type 23	96	CY	3.80	433	21.12			92.00		$9,140		$9,050		$18,190
D	41. Micellaneous and support materials	1	LOT	108.00	108	21.12			2544.00		$2,280		$2,610		$4,890
32	Standby Electrical														
D	1. Install generator 700kw,(32-eg-001)	1	EA	250.0	296	21.12				317000	$6,250			$324,930	$331,180
D	2. Install transfer switch 480v,(32-ts-001)	1	EA	60.0	71	21.12				80000	$1,500			$82,000	$83,500
D	3. Install transfer switch 480v,(32-ts-002)	1	EA	60.0	71	21.12					$1,500				$1,500
D	4. Install transfer switch 480v,(32-ts-003)	1	EA	60.0	71	21.12					$1,500				$1,500
D	5. Install 3" conduit galv. rigid stl.	1325	FT	0.28	440	21.12			6.41		$9,290		$8,710		$18,000
D	6. Install 3" "LBD" ftg. w/cover & gasket	79	EA	4.50	421	21.12			160.50		$8,890		$13,000		$21,890
D	7. Install 3" conduit union "UNY"	34	EA	2.50	101	21.12			76.00		$2,130		$2,650		$4,780
D	8. Install 3" cond. hub	38	EA	2.50	113	21.12			33.30		$2,390		$1,300		$3,690
D	9. Install power wire 3#350kcm w/ #1/0 grd	1705	FT	0.20	406	21.12			8.18		$8,570		$14,300		$22,870
D	10. Install power wire 3#750kcm w/ #1/0 grd	920	FT	0.28	300	21.12			18.90		$6,340		$17,820		$24,160
D	11. Install wire term. 600v, 1/c #1/0	38	EA	0.70	32	21.12			2.75		$680		$110		$790
D	12. Install wire term. 600v, 1/c #350kcm	114	EA	1.50	203	21.12			6.20		$4,290		$720		$5,010
D	13. Install wire term. 600v, 1/c #750kcm	66	EA	2.00	156	21.12			18.00		$3,290		$1,220		$4,510
D	14. Micellaneous and support materials	1	LOT	221.00	221	21.12			6005.00		$4,670		$6,160		$10,830
33	Uninterruptible Power														
D	1. Install uninterruptible power sply(up-33-0	1	EA	140.0	166	21.12				33000	$3,510			$33,830	$37,340
D	2. Install local disc. switch 60a-600v	1	EA	3.5	4	21.12			335.00		$80		$340		$420
D	3. Install 1-1/2" conduit galv. rigid stl.	200	FT	0.14	33	21.12			2.30		$700		$470		$1,170
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	21.12			27.00		$360		$190		$550
D	5. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	6. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	7. Install 1-1/2" cond. hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire 3#4 w/ #8 grd.	215	FT	0.07	17	21.12			1.15		$360		$250		$610
D	9. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	11. Micellaneous and support materials	1	LOT	8.00	9	21.12			150.00		$190		$150		$340
34	Lighting														

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DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	1. Install rnd. stl. pole w/2" tenon	20	EA	12.0	285	21.12			910.00		$6,020		$18,660		$24,680
D	2. Install stl. arm w/fittings	12	EA	4.0	57	21.12			160.00		$1,200		$1,970		$3,170
D	3. Install stl. brkt. for floodlights	17	EA	1.00	20	21.12			90.00		$420		$1,570		$1,990
D	4. Install rdwy. fixt. 400w w/lamp	12	EA	3.60	51	21.12			370.00		$1,080		$4,550		$5,630
D	5. Install fldlght fixt. 250w w/lamp	37	EA	3.30	145	21.12			300.00		$3,060		$11,380		$14,440
D	6. Install 1" pvc sch.40 conduit	2300	FT	0.07	191	21.12			0.37		$4,030		$870		$4,900
D	7. Install 1" rsg conduit elbow	44	EA	0.40	21	21.12			17.50		$440		$790		$1,230
D	8. Install 1" sealing hub	44	EA	0.80	42	21.12			14.60		$890		$660		$1,550
D	9. Install 1-1/2" insult. grd. bushing	44	EA	0.80	42	21.12			12.60		$890		$570		$1,460
D	10. Install #2 grd. wire cont. type "KC"	22	EA	0.50	13	21.12			14.80		$270		$330		$600
D	11. Install str. cu 600v, 3#10 w/ #10 grd.	2500	FT	0.03	95	21.12			0.48		$2,010		$1,230		$3,240
D	12. Install str. cu 600v, 3#12 w/ #12 grd.	800	FT	0.04	34	21.12			0.36		$720		$300		$1,020
D	13. Install mach. trench. for lighting	357	CY	0.30	127	21.12					$2,680				$2,680
D	14. Install mach. excav. for lighting	116	CY	0.50	69	21.12					$1,460				$1,460
D	15. Backfill & compact	381	CY	0.40	181	21.12					$3,820				$3,820
D	16. Load, haul & dump	163	CY	0.10	19	21.12					$400				$400
D	17. Install concrete elect. ductbank	126	CY	3.8	568	21.12			92.00		$12,000		$11,880		$23,880
D	18. Install concrete stl. pole footing	18	CY	16.9	361	21.12			176.00		$7,620		$3,250		$10,870
D	19. Micellaneous and support materials	1	LOT	42.00	42	21.12			2927.00		$890		$3,000		$3,890
35	Grounding														
D	1. Install grd. well assy.	44	EA	8.0	417	21.12			143.00		$8,810		$6,450		$15,260
D	2. Install grd. test bar assy.	14	EA	7.7	128	21.12			169.00		$2,700		$2,430		$5,130
D	3. Install power transf. grdg.	2	EA	3.60	9	21.12			51.50		$190		$110		$300
D	4. Install switchgear grdg.	2	EA	2.50	6	21.12			56.50		$130		$120		$250
D	5. Install MCC grounding	8	EA	2.50	24	21.12			56.50		$510		$460		$970
D	6. Install storage tank grndg.	20	EA	1.00	24	21.12			17.50		$510		$360		$870
D	7. Install vessel or exch. grdg.	2	EA	2.30	5	21.12			25.40		$110		$50		$160
D	8. Install stl. colm. grdg.	102	EA	1.00	121	21.12			17.80		$2,560		$1,860		$4,420
D	9. Install fence post grdg.	6	EA	1.00	7	21.12			57.20		$150		$350		$500
D	10. Install fence gate grdg.	2	EA	2.70	6	21.12			148.80		$130		$310		$440
D	11. Install miscl. equip. grdg.	10	EA	1.00	12	21.12			17.80		$250		$180		$430
D	12. Install #4/0 to #4/0 "T" weld	60	EA	2.00	142	21.12			10.15		$3,000		$620		$3,620
D	13. Install #4/0 to #2 "T" weld	110	EA	2.00	261	21.12			7.55		$5,510		$850		$6,360
D	14. Install 1/c #2 str. cu grd. wire	2500	FT	0.02	53	21.12			0.49		$1,120		$1,260		$2,380

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	15. Install 1/c #4/o str. cu grd. wire	4500	FT	0.03	160	21.12			1.47		$3,380		$6,780		$10,160
D	16. Install mach. excav. for grd. well	4	CY	0.50	2	21.12					$40				$40
D	17. Install mach. trench. for grd. wire	224	CY	0.3	80	21.12					$1,690				$1,690
D	18. Backfill & compaction	261	CY	0.4	124	21.12					$2,620				$2,620
D	19. Micellaneous and support materials	1	LOT	58.00	58	21.12			1515.00		$1,220		$1,550		$2,770
36	Lightning Protection														
D	1. Install air term. w/ base 3/8" x 10" rf. mtd	50	EA	1.2	71	21.12			25.00		$1,500		$1,280		$2,780
D	2. Install #2/0 str. cu wire	1800	FT	0.03	53	21.12			0.94		$1,120		$1,730		$2,850
D	3. Install #2/0 - #4/0 "T" exothermic weld	10	EA	2.00	24	21.12			7.55		$510		$80		$590
D	4. Micellaneous and support materials	1	LOT	37.00	37	21.12			791.00		$780		$810		$1,590
40	Plant & Instrument Air														
D	1. Install mtr. flex cond. conn. assy. 10hp	1	EA	12.9	15	21.12			181.00		$320		$190		$510
D	2. Install mtr. flex cond. conn. assy. 100hp	1	EA	10.10	12	21.12			187.00		$250		$190		$440
D	3. Install 3/4" sealtite flex conmd w/2 conct.	2	LOT	0.80	2	21.12			12.05		$40		$20		$60
D	4. Install starter & fused disc. switch	2	EA	2.50	6	21.12			150.00		$130		$310		$440
D	5. Install start-stop button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	6. Install 3/4" conduit galv. stl.	520	FT	0.08	49	21.12			0.95		$1,030		$510		$1,540
D	7. Install 1-1/2" conduit galv. stl.	130	FT	0.17	26	21.12			2.30		$550		$310		$860
D	8. Install 3/4" "L" ftg. w/ cover & gasket	20	EA	1.00	24	21.12			9.90		$510		$200		$710
D	9. Install 1-1/2" "LBD" ftg. w/ cover & gaske	3	EA	2.00	7	21.12			27.00		$150		$80		$230
D	10. Install 3/4" conduit union "UNY"	8	EA	0.80	8	21.12			7.90		$170		$60		$230
D	11. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	12. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	13. Install 1-1/2" conduit seal "EYS"	1	EA	1.50	2	21.12			23.20		$40		$20		$60
D	14. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	15. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	16. Install cntrl. wire str. cu 3#14	290	FT	0.03	9	21.12			0.21		$190		$60		$250
D	17. Install power wire str. cu 3#12 w/#12grd	435	FT	0.04	19	21.12			0.36		$400		$160		$560
D	18. Install power wire str. cu 3#4/0 w/#4grd.	145	FT	0.14	25	21.12			3.18		$530		$470		$1,000
D	19. Install wire term. 600v 1/c#14	12	EA	0.20	3	21.12			0.20		$60				$60
D	20. Install wire term. 600v 1/c#12	24	EA	0.20	6	21.12			0.25		$130		$10		$140
D	21. Install wire term. 600v 1/c#4	2	EA	0.40	1	21.12			1.30		$20				$20
D	22. Install wire term. 600v 1/c#2/0	6	EA	0.80	6	21.12			3.20		$130		$20		$150
D	23. Install mtr. cont. kit 600v #14-#10	1	EA	0.50	1	21.12			12.00		$20		$10		$30

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DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	24. Install mtr. cont. kit 600v #2-#4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	25. Micellaneous and support materials	1	LOT	19.00	23	21.12			302.00		$490		$310		$800
41	Breathing Air System														
D	1. Install mtr. flex cond. conn. assy 50hp	2	EA	15.9	38	21.12			247.00		$800		$510		$1,310
D	2. Install start-stop push button station	2	EA	2.3	5	21.12			120.00		$110		$250		$360
D	3. Install 1-1/2" conduit galv. stl.	800	FT	0.14	133	21.12			2.30		$2,810		$1,890		$4,700
D	4. Install 1-1/2" "L" ftg. w/ cover & gasket	16	FT	2.00	38	21.12			27.00		$800		$440		$1,240
D	5. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	6. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	21.12			23.20		$60		$50		$110
D	7. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire 600v, 3#4 w/ #8 grd	830	FT	0.07	67	21.12			1.15		$1,420		$980		$2,400
D	9. Install wire term. 600v, 1/c #8	4	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	11. Install mtr. conn. kit 600v, #8- #4	2	EA	0.60	1	21.12			21.00		$20		$40		$60
D	12. Micellaneous and support materials	1	LOT	30.00	36	21.12			519.00		$760		$530		$1,290
44	Product Additive														
D	1. Install mtr. flex cond. conn. assy. 10hp	6	EA	12.9	92	21.12			181.00		$1,940		$1,110		$3,050
D	2. Install 3/4" sealtite flex conmd w/2 conct	4	EA	0.80	4	21.12			12.05		$80		$50		$130
D	3. Install start-stop button station	6	EA	2.30	16	21.12			120.00		$340		$740		$1,080
D	4. Install 3/4" conduit galv. stl.	4400	FT	0.08	417	21.12			0.95		$8,810		$4,280		$13,090
D	5. Install 3/4" "L" ftg. w/ cover & gasket	88	EA	1.00	104	21.12			9.90		$2,200		$890		$3,090
D	10. Install 3/4" conduit union "UNY"	36	EA	0.80	34	21.12			7.90		$720		$290		$1,010
D	12. Install 3/4" conduit seal "EYS"	11	EA	0.90	12	21.12			10.00		$250		$110		$360
D	14. Install 3/4" conduit hub	11	EA	0.80	10	21.12			4.40		$210		$50		$260
D	16. Install cntrl. wire str. cu 3#14	3810	FT	0.03	122	21.12			0.21		$2,580		$820		$3,400
D	17. Install power wire str. cu 3#12 w/#12grd	4570	FT	0.04	195	21.12			0.36		$4,120		$1,690		$5,810
D	19. Install wire term. 600v 1/c#14	36	EA	0.20	9	21.12			0.20		$190		$10		$200
D	20. Install wire term. 600v 1/c#12	62	EA	0.20	15	21.12			0.25		$320		$20		$340
D	21. Install mtr. cont. kit 600v #14-#10	6	EA	0.50	4	21.12			12.00		$80		$70		$150
D	22. Micellaneous and support materials	1	LOT	207.00	207	21.12			2969.00		$4,370		$3,040		$7,410
53	Cooling Water														
D	1. Install mtr. flex cond. conn. assy. 20hp	3	EA	13.2	47	21.12			164.00		$990		$500		$1,490
D	2. Install start-stop button station	3	EA	2.30	8	21.12			120.00		$170		$370		$540
D	3. Install 1" conduit galv. stl.	1050	FT	0.11	137	21.12			1.44		$2,890		$1,550		$4,440

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	4. Install 1" "L" ftg. w/ cover & gasket	21	EA	1.20	30	21.12			14.50		$630		$310		$940
D	5. Install 1" conduit union "UNY"	8	EA	1.00	9	21.12			13.40		$190		$110		$300
D	6. Install 1" conduit seal "EYS"	3	EA	1.00	4	21.12			13.00		$80		$40		$120
D	7. Install 1" conduit hub	3	EA	1.00	4	21.12			5.20		$80		$20		$100
D	8. Install cntrl. wire 600v, 3#14	1095	FT	0.03	35	21.12			0.21		$740		$240		$980
D	9. Install power wire 3#8 w/ #10 grd.	1095	FT	0.05	69	21.12			0.60		$1,460		$670		$2,130
D	10. Install wire term. 600v, 1/c #14	18	EA	0.20	4	21.12			0.20		$80				$80
D	11. Install wire term. 600v, 1/c #10	6	EA	0.20	1	21.12			0.25		$20				$20
D	12. Install wire term. 600v, 1/c #8	18	EA	0.30	6	21.12			0.90		$130		$20		$150
D	13. Install mtr. cont. kit, 600v, #8- #4	3	EA	0.60	2	21.12			21.00		$40		$60		$100
D	14. Micellaneous and support materials	1	LOT	32.00	38	21.12			447.00		$800		$460		$1,260
64	Radioactive Waste System														
D	1. Install mtr. flex cond. conn. assy. 10hp	14	EA	12.9	214	21.12			181.00		$4,520		$2,600		$7,120
D	2. Install start-stop button station	14	EA	2.30	38	21.12			120.00		$800		$1,720		$2,520
D	3. Install 3/4" conduit galv. stl.	4900	FT	0.08	465	21.12			0.95		$9,820		$4,770		$14,590
D	4. Install 3/4" "L" ftg. w/ cover & gasket	98	EA	1.00	116	21.12			9.90		$2,450		$990		$3,440
D	5. Install 3/4" conduit union "UNY"	42	EA	0.80	40	21.12			7.90		$840		$340		$1,180
D	6. Install 3/4" conduit seal "EYS"	15	EA	0.90	16	21.12			10.00		$340		$150		$490
D	7. Install 3/4" conduit hub	15	EA	0.80	14	21.12			4.40		$300		$70		$370
D	8. Install cntrl. wire str. cu 3#14	5110	FT	0.03	164	21.12			0.21		$3,460		$1,100		$4,560
D	9. Install power wire str. cu 3#12 w/#12grd	5110	FT	0.04	218	21.12			0.36		$4,600		$1,890		$6,490
D	10. Install wire term. 600v 1/c#14	84	EA	0.20	20	21.12			0.20		$420		$20		$440
D	11. Install wire term. 600v 1/c#12	112	EA	0.20	27	21.12			0.25		$570		$30		$600
D	12. Install mtr. cont. kit 600v #14-#10	14	EA	0.50	8	21.12			12.00		$170		$170		$340
D	13. Micellaneous and support materials	1	LOT	116.00	116	21.12			1505.00		$2,450		$1,540		$3,990
73	Product Handling Bldg. HVAC														
D	1. Install disc. switch 100a, 600v, 3ph	2	EA	4.2	10	21.12			335.00		$210		$690		$900
D	2. Install disc. switch 600a, 600v, 3ph	2	EA	13.3	32	21.12			1800.00		$680		$3,690		$4,370
D	3. Install disc. switch 400a, 600v, 3ph	4	EA	8.90	42	21.12			1050.00		$890		$4,310		$5,200
D	4. Install starter & fused disc. switch	8	EA	2.30	22	21.12			120.00		$460		$980		$1,440
D	5. Install 2" seal. flex cond. w/ 2conn.	1	LOT	2.00	2	21.12			61.80		$40		$60		$100
D	6. Install 3" seal. flex cond. w/ 2conn.	5	LOT	3.50	21	21.12			334.00		$440		$1,710		$2,150
D	7. Install mtr. flex cond. conn. assy. 15hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	8. Install mtr. flex cond. conn. assy. 25-30h	6	EA	13.2	94	21.12			164.00		$1,990		$1,010		$3,000

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DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	9. Install 3/4" conduit galv. rigid stl.	2000	FT	0.08	190	21.12			0.95		$4,010		$1,950		$5,960
D	10. Install 1" conduit galv. rigid stl.	2400	FT	0.11	313	21.12			1.44		$6,610		$3,540		$10,150
D	11. Install 2" conduit galv. rigid stl.	400	FT	0.17	81	21.12			3.08		$1,710		$1,260		$2,970
D	12. Install 3" conduit galv. rigid stl.	2000	FT	0.28	664	21.12			6.41		$14,020		$13,140		$27,160
D	13. Install 3/4" "L" ftg. w/cover & gasket	40	EA	1.00	47	21.12			9.90		$990		$410		$1,400
D	14. Install 1" "L" ftg. w/cover & gasket	48	EA	1.20	68	21.12			14.50		$1,440		$710		$2,150
D	15. Install 2" "L" ftg. w/cover & gasket	8	EA	2.50	24	21.12			54.00		$510		$440		$950
D	16. Install 3" "L" ftg. w/cover & gasket	40	EA	4.50	213	21.12			160.00		$4,500		$6,560		$11,060
D	17. Install 3/4" conduit union "UNY"	16	EA	0.80	15	21.12			7.90		$320		$130		$450
D	18. Install 1" conduit union "UNY"	20	EA	1.00	24	21.12			13.40		$510		$270		$780
D	19. Install 2" conduit union "UNY"	3	EA	1.60	6	21.12			34.40		$130		$110		$240
D	20. Install 3" conduit union "UNY"	16	EA	2.50	47	21.12			76.00		$990		$1,250		$2,240
D	21. Install 3/4" conduit seal "EYS"	5	EA	0.90	5	21.12			10.00		$110		$50		$160
D	22. Install 1" conduit seal "EYS"	4	EA	1.00	5	21.12			13.00		$110		$50		$160
D	23. Install 1-1/2" conduit seal "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	24. Install 3" conduit seal "EYS"	5	EA	2.10	12	21.12			59.40		$250		$300		$550
D	25. Install 3/4" conduit hub	5	EA	0.80	5	21.12			4.40		$110		$20		$130
D	26. Install 1" conduit hub	4	EA	1.00	5	21.12			5.20		$110		$20		$130
D	27. Install 1-1/2" conduit hub	1	EA	1.90	2	21.12			11.00		$40		$10		$50
D	28. Install 3" conduit hub	5	EA	2.50	15	21.12			33.30		$320		$170		$490
D	29. Install cntrl. wire, 600v, 3#14	3360	FT	0.03	108	21.12			0.21		$2,280		$720		$3,000
D	30. Install power wire 3#6 w/ #8 grd.	840	FT	0.06	59	21.12			0.85		$1,250		$730		$1,980
D	31. Install power wire 3#12 w/ #12 grd.	420	FT	0.04	18	21.12			0.36		$380		$150		$530
D	32. Install power wire 3#250 w/ #2 grd.	1260	FT	0.17	246	21.12			6.08		$5,200		$7,850		$13,050
D	33. Install power wire 3#2 w/ #8 grd.	420	FT	0.15	73	21.12			5.33		$1,540		$2,290		$3,830
D	34. Install power wire 3#350 w/ #1/0 grd.	840	FT	0.20	200	21.12			8.67		$4,220		$7,460		$11,680
D	35. Install wire term. 600v, 1/c #12	8	EA	0.20	2	21.12			0.25		$40				$40
D	36. Install wire term. 600v, 1/c #14	48	EA	0.20	11	21.12			0.20		$230		$10		$240
D	37. Install wire term. 600v, 1/c #8	36	EA	0.30	13	21.12			0.90		$270		$30		$300
D	38. Install wire term. 600v, 1/c #2	8	EA	0.40	4	21.12			2.45		$80		$20		$100
D	39. Install wire term. 600v, 1/c #6	12	EA	0.40	6	21.12			1.00		$130		$10		$140
D	40. Install wire term. 600v, 1/c #1/0	4	EA	0.70	3	21.12			2.75		$60		$10		$70
D	41. Install wire term. 600v, 1/c #250	18	EA	1.30	28	21.12			5.10		$590		$90		$680
D	42. Install wire term. 600v, 1/c #350	12	EA	1.50	21	21.12			6.20		$440		$80		$520

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	43. Install mtr. cont. kit, 600V, #14-#10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
D	44. Install mtr. cont. kit, 600V, #8- #4	6	EA	0.60	4	21.12			21.00		$80		$130		$210
D	45. Micellaneous and support materials	1	LOT	164.00	164	21.12			3346.00		$3,460		$3,430		$6,890
75	Analytical Lab. HVAC System														
D	1. Install mtr. flex conn. assy up to 10 hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	2. Install disc. switch, 30a, 600v, 3ph	1	EA	2.5	3	21.12			150.00		$60		$150		$210
D	3. Install disc. switch, 60a, 600v, 3ph	1	EA	3.50	4	21.12			335.00		$80		$340		$420
D	4. Install starter & fused disc. switch	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	5. Install 3/4" seal. flex cond. w/ 2 conn	1	LOT	0.80	1	21.12			12.05		$20		$10		$30
D	6. Install 1-1/2" seal. flex cond. w/ 2 conn	1	LOT	1.50	2	21.12			35.70		$40		$40		$80
D	7. Install 3/4" conduit galv. rigid stl.	750	FT	0.08	71	21.12			0.95		$1,500		$730		$2,230
D	8. Install 1-1/2" conduit galv. rigid stl.	250	FT	0.14	41	21.12			2.30		$870		$590		$1,460
D	9. Install 3/4" "L" ftg. w/cover & gasket	15	EA	1.00	18	21.12			9.90		$380		$150		$530
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	5	EA	2.00	12	21.12			27.00		$250		$140		$390
D	11. Install 3/4" conduit union "UNY"	6	EA	0.80	6	21.12			7.90		$130		$50		$180
D	12. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	13. Install 3/4" conduit seal "EYS"	3	EA	0.90	3	21.12			10.00		$60		$30		$90
D	14. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	15. Install 3/4" conduit hub	3	EA	0.80	3	21.12			4.40		$60		$10		$70
D	16. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	17. Install cntrl. wire 600v, 3 #14	540	FT	0.03	17	21.12			0.21		$360		$120		$480
D	18. Install power wire 3#10 w/ #10 grd.	270	FT	0.04	14	21.12			0.48		$300		$130		$430
D	19. Install power wire 3#12 w/ #12 grd.	540	FT	0.04	23	21.12			0.36		$490		$200		$690
D	20. Install power wire 3#2 w/ #8 grd.	270	FT	0.08	25	21.12			1.66		$530		$460		$990
D	21. Install wire term. 600v, 1/c #12	16	EA	0.20	4	21.12			0.25		$80				$80
D	22. Install wire term. 600v, 1/c #10	8	EA	0.20	2	21.12			0.25		$40				$40
D	23. Install wire term. 600v, 1/c #8	2	EA	0.40	1	21.12			1.00		$20				$20
D	24. Install wire term. 600v, 1/c #2	6	EA	0.50	4	21.12			2.45		$80		$20		$100
D	25. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	26. Install mtr. cont. kit, 600V, #14-#10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
D	27. Micellaneous and support materials	1	LOT	27.00	32	21.12			422.00		$680		$430		$1,110
76	Maint. & Warehouse Fac. HVAC														
D	1. Install 3/4" flex cond. w/ 2 conncectors	14	LOT	0.8	13	21.12			12.05		$270		$170		$440
D	2. Install disc. switch, 30a, 600v, 3ph fuse	14	EA	2.5	41	21.12			150.00		$870		$2,150		$3,020

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	3. Install 3/4" conduit galv. rigid stl.	5200	FT	0.08	493	21.12			0.95		$10,410		$5,060		$15,470
D	4. Install 3/4" "L" ftg. w/cover & gasket	112	EA	1.00	133	21.12			9.90		$2,810		$1,140		$3,950
D	5. Install 3/4" conduit union "UNY"	45	EA	0.80	43	21.12			7.90		$910		$360		$1,270
D	6. Install 3/4" conduit seal "EYS"	15	EA	0.90	16	21.12			10.00		$340		$150		$490
D	7. Install 3/4" conduit hub	15	EA	0.80	14	21.12			4.40		$300		$70		$370
D	8. Install power wire 3#8 w/ #10 grd.	2730	FT	0.05	172	21.12			0.60		$3,630		$1,680		$5,310
D	9. Install power wire 3#12 w/ #12 grd.	2730	FT	0.04	117	21.12			0.36		$2,470		$1,010		$3,480
D	10. Install wire term. 600v, 1/c #12	56	EA	0.20	13	21.12			0.20		$270		$10		$280
D	11. Install wire term. 600v, 1/c #10	14	EA	0.20	3	21.12			0.25		$60				$60
D	12. Install wire term. 600v, 1/c #8	42	EA	0.25	12	21.12			0.90		$250		$40		$290
D	13. Micellaneous and support materials	1	LOT	107.00	107	21.12			1402.00		$2,260		$1,440		$3,700
77	Misc. Facilities HVAC System														
D	1. Install 3/4" flex cond. w/ 2 conncectors	3	LOT	0.8	3	21.12			12.05		$60		$40		$100
D	2. Install disc. switch, 30a, 600v, 3ph fuse	3	EA	2.5	9	21.12			150.00		$190		$460		$650
D	3. Install 3/4" conduit galv. rigid stl.	1200	FT	0.08	114	21.12			0.95		$2,410		$1,170		$3,580
D	4. Install 3/4" "L" ftg. w/cover & gasket	24	EA	1.00	28	21.12			9.90		$590		$240		$830
D	5. Install 3/4" conduit union "UNY"	10	EA	0.80	9	21.12			7.90		$190		$80		$270
D	6. Install 3/4" conduit seal "EYS"	3	EA	0.90	3	21.12			10.00		$60		$30		$90
D	7. Install 3/4" conduit hub	3	EA	0.80	3	21.12			4.40		$60		$10		$70
D	8. Install power wire 3#12 w/ #12 grd.	1260	FT	0.04	54	21.12			0.36		$1,140		$460		$1,600
D	9. Install wire term. 600v, 1/c #12	24	EA	0.20	6	21.12			0.20		$130				$130
D	10. Micellaneous and support materials	1	LOT	24.00	28	21.12			308.00		$590		$320		$910
80	Maintenance Equipment														
D	1. Install weld recept, 480v,60a box	1	EA	6.0	7	21.12			475.00		$150		$490		$640
D	2. Install weld recept assy.	1	EA	3.0	4	21.12			33.00		$80		$30		$110
D	3. Install 1" sealt. flex cond. w/ 2 conn	2	LOT	1.1	3	21.12			18.50		$60		$40		$100
D	4. Install disc. switch, 30a, 600v, 3ph	3	EA	2.5	9	21.12			150.00		$190		$460		$650
D	5. Install disc. switch, 60a, 600v, 3ph	2	EA	3.5	8	21.12			335.00		$170		$690		$860
D	6. Install 3/4" flex cond. w/ 2 conncectors	5	LOT	0.8	5	21.12			12.00		$110		$60		$170
D	7. Install starter & fused disc. switch	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	8. Install 3/4" conduit galv. rigid stl.	2000	FT	0.08	190	21.12			0.95		$4,010		$1,950		$5,960
D	9. Install 1" conduit galv. rigid stl.	800	FT	0.11	104	21.12			1.44		$2,200		$1,180		$3,380
D	10. Install 1-1/2" conduit galv. rigid stl.	400	FT	0.14	66	21.12			2.30		$1,390		$940		$2,330
D	11. Install 3/4" "L" ftg. w/cover & gasket	40	EA	1.00	47	21.12			9.90		$990		$410		$1,400

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 · Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	12. Install 1" "L" ftg. w/cover & gasket	16	FT	1.20	23	21.12			1.44		$490		$20		$510
D	13. Install 1-1/2" "L" ftg. w/cover & gasket	8	FT	2.00	19	21.12			2.30		$400		$20		$420
D	14. Install 3/4" conduit union "UNY"	16	EA	0.80	15	21.12			7.90		$320		$130		$450
D	15. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	16. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	17. Install 3/4" conduit seal "EYS"	6	EA	0.90	6	21.12			10.00		$130		$60		$190
D	18. Install 1" conduit seal "EYS"	2	EA	1.00	2	21.12			13.00		$40		$30		$70
D	19. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	20. Install 3/4" conduit hub	6	EA	0.80	6	21.12			4.40		$130		$30		$160
D	21. Install 1" conduit hub	2	EA	1.00	2	21.12			5.20		$40		$10		$50
D	22. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	23. Install cntrl. wire, 600v, 3 - #14	1260	FT	0.03	40	21.12			0.21		$840		$270		$1,110
D	24. Install power wire 3#12 w/ #12 grd.	1260	FT	0.04	54	21.12			0.36		$1,140		$460		$1,600
D	25. Install power wire 3 #10w/ #10 grd.	880	EA	0.04	46	21.12			0.48		$970		$430		$1,400
D	26. Install power wire 3 #4w/ #8 grd	880	EA	0.07	71	21.12			1.15		$1,500		$1,040		$2,540
D	27. Install power wire 3 #2w/ #8 grd.	440	EA	0.08	40	21.12			1.66		$840		$750		$1,590
D	28. Install wire term. 600v, 1/c #12	24	EA	0.20	6	21.12			0.20		$130				$130
D	29. Install wire term. 600v, 1/c #14	18	EA	0.20	4	21.12			0.20		$80				$80
D	30. Install wire term. 600v, 1/c #10	16	EA	0.20	4	21.12			0.25		$80				$80
D	31. Install wire term. 600v, 1/c #8	6	EA	0.30	2	21.12			0.90		$40		$10		$50
D	32. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	33. Install wire term. 600v, 1/c #2	6	EA	0.50	4	21.12			2.45		$80		$20		$100
D	34. Miscellaneous and support materials	1	LOT	80.00	80	21.12			1188.00		$1,690		$1,220		$2,910
82	Remote Handling Equipment														
D	1. Install 3/4" flex cond. w/ 2 conncectors	3	LOT	0.8	3	21.12			12.00		$60		$40		$100
D	2. Install disc. switch, 30a, 600v, 3ph fused	3	EA	2.50	9	21.12			150.00		$190		$460		$650
D	3. Install 3/4" conduit galv. rigid stl.	1200	FT	0.08	114	21.12			0.95		$2,410		$1,170		$3,580
D	4. Install 3/4" "L" ftg. w/cover & gasket	24	EA	1.00	28	21.12			9.90		$590		$240		$830
D	5. Install 3/4" conduit union "UNY"	9	EA	0.80	9	21.12			7.90		$190		$70		$260
D	6. Install 3/4" conduit seal "EYS"	3	EA	0.90	3	21.12			10.00		$60		$30		$90
D	7. Install 3/4" conduit hub	3	EA	0.80	3	21.12			4.40		$60		$10		$70
D	8. Install power wire 3#8 w/ #10 grd.	1260	FT	0.05	79	21.12			0.60		$1,670		$770		$2,440
D	9. Install wire term. 600v, 1/c #10	6	EA	0.20	1	21.12			0.20		$20				$20
D	10. Install wire term. 600V, 1/c #8	18	EA	0.30	6	21.12			0.85		$130		$20		$150
D	11. Miscellaneous and support materials	1	LOT	25.00	30	21.12			330.00		$630		$340		$970

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Radiation Shielding Equipment sys. 83														
D	1. Install 3/4" flex cond. w/ 2 conncectors	18	LOT	0.8	17	21.12			12.00		$360		$220		$580
D	2. Install disc. switch, 30a, 600v, 3ph fused	18	EA	2.50	53	21.12			150.00		$1,120		$2,770		$3,890
D	3. Install 3/4" conduit galv. rigid stl.	7560	FT	0.08	717	21.12			0.95		$15,140		$7,360		$22,500
D	4. Install 3/4" "L" ftg. w/cover & gasket	162	EA	1.00	192	21.12			9.90		$4,060		$1,640		$5,700
D	5. Install 3/4" conduit union "UNY"	72	EA	0.80	68	21.12			7.90		$1,440		$580		$2,020
D	6. Install 3/4" conduit seal "EYS"	20	EA	0.90	21	21.12			10.00		$440		$210		$650
D	7. Install 3/4" conduit hub	20	EA	0.80	19	21.12			4.40		$400		$90		$490
D	8. Install power wire 3#12 w/ #12 grd.	7900	FT	0.04	337	21.12			0.36		$7,120		$2,920		$10,040
D	9. Install wire term. 600v, 1/c #12	144	EA	0.20	34	21.12			0.25		$720		$40		$760
D	10. Miscellaneous and support materials	1	LOT	153.00	153	21.12			1943.00		$3,230		$1,990		$5,220
85	CCTV System														
D	1. Install 3/4" conduit galv. rigid stl.	5200	FT	0.08	493	21.12			0.95		$10,410		$5,060		$15,470
D	2. Install 3/4" "L" ftg. w/cover & gasket	104	EA	1.00	123	21.12			9.90		$2,600		$1,060		$3,660
D	3. Install 3/4" conduit union "UNY"	58	EA	0.80	55	21.12			7.90		$1,160		$470		$1,630
D	4. Install 3/4" conduit seal "EYS"	58	EA	0.90	62	21.12			10.00		$1,310		$590		$1,900
D	5. Install 3/4" conduit hub	58	EA	0.80	55	21.12			4.40		$1,160		$260		$1,420
D	6. Install power wire 3#12 w/ #12 grd.	3000	FT	0.04	128	21.12			0.36		$2,700		$1,110		$3,810
D	7. Install pan & tilt cntrl. wire, 600v, 3#14	3000	FT	0.03	96	21.12			0.21		$2,030		$650		$2,680
D	8. Install wire term. 600v, 1/c #14	156	EA	0.20	37	21.12			0.20		$780		$30		$810
D	9. Install wire term. 600v, 1/c #12	208	EA	0.20	49	21.12			0.25		$1,030		$50		$1,080
D	10. Install wire term. 600v, co-axial cable	52	EA	0.20	12	21.12			3.00		$250		$160		$410
D	11. Install video cable, co-axial cable	3000	FT	0.01	36	21.12			0.21		$760		$650		$1,410
D	12. Miscellaneous and support materials	1	LOT	110.00	110	21.12			1282.00		$2,320		$1,310		$3,630
73	Product Handling Bldg. HVAC														
D	1. Install disc. switch 30a,600v,3p	1	EA	2.50	3	21.12			159.00		$60		$160		$220
D	2. Install power wire 3#10 w/#10grd	840	EA	0.04	44	21.12			0.48		$930		$410		$1,340
D	3. Install power wire 3#8 w/#10 grd	2520	EA	0.05	158	21.12			0.60		$3,340		$1,550		$4,890
D	4. Install wire term., 600v, 1/c #10	16	EA	0.20	4	21.12			0.25		$80				$80
90	Distributed Control System														
D	1. Install 1-1/2" galv. rigid stl. conduit	2500	FT	0.14	415	21.12			2.3		$8,760		$5,890		$14,650
D	2. Install 2" galv. rigid stl. conduit	7000	FT	0.17	1411	21.12			3.08		$29,800		$22,100		$51,900
D	3. Install 1-1/2" "L" ftg. w/cover & gasket	75	EA	2.00	178	21.12			27.00		$3,760		$2,080		$5,840
D	4. Install 2" "L" ftg. w/cover & gasket	210	EA	2.50	622	21.12			42.00		$13,140		$9,040		$22,180

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	5. Install 1-1/2" conduit union "UNY"	28	EA	1.50	50	21.12			26.70		$1,060		$770		$1,830
D	6. Install 2" conduit union "UNY"	78	EA	1.90	176	21.12			34.40		$3,720		$2,750		$6,470
D	20. Install 1-1/2" conduit seal "EYS"	5	EA	1.40	8	21.12			23.20		$170		$120		$290
D	21. Install 2" conduit seal "EYS"	14	EA	1.60	27	21.12			30.20		$570		$430		$1,000
D	22. Install 1-1/2" conduit hub	10	EA	1.50	18	21.12			7.90		$380		$80		$460
D	23. Install 2" conduit hub	28	EA	1.90	63	21.12			11.00		$1,330		$320		$1,650
D	24. Install 12pr #20 instr. cable, 300v	2600	FT	0.04	111	21.12			1.20		$2,340		$3,200		$5,540
D	25. Install 24pr #20 instr. cable, 300v	7300	FT	0.06	476	21.12			2.10		$10,050		$15,710		$25,760
D	26. Install 1pr-#20 wire termination, 300v	792	EA	0.40	376	21.12			0.30		$7,940		$240		$8,180
D	27. Miscellaneous and support materials	1	LOT	397.00	397	21.12			7561.00		$8,380		$7,750		$16,130
92	Fire Detection & Alarm														
D	1. Install manual smoke detectors	1	LOT	500.0	593	21.12			7000		$12,520		$7,180		$19,700
D	Install miscl. conduit fitting & wires														
93	Health Protection														
D	1. Install flex cond. assy. for monitors	30	EA	1.1	39	21.12			14.00		$820		$430		$1,250
D	2. Install stn. stl. box (20" x 20" x 6")	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" cond. galv. stl.	1500	FT	0.08	142	21.12			0.95		$3,000		$1,460		$4,460
D	4. Install 1" cond. galv. stl.	200	FT	0.11	26	21.12			1.44		$550		$300		$850
D	5. Install 1-1/2" cond. galv. stl.	170	FT	0.14	28	21.12			2.30		$590		$400		$990
D	6. Install 2" cond. galv. stl.	80	FT	0.17	16	21.12			3.08		$340		$250		$590
D	7. Install 3/4" "L" ftg. w/cover & gasket	48	EA	1.00	57	21.12			9.90		$1,200		$490		$1,690
D	8. Install 1" "L" ftg. w/cover & gasket	6	EA	1.20	9	21.12			14.50		$190		$90		$280
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	6	EA	2.00	14	21.12			27.00		$300		$170		$470
D	10. Install 2" "L" ftg. w/cover & gasket	4	EA	2.50	12	21.12			42.00		$250		$170		$420
D	11. Install 3/4" "T" ftg. w/cover & gasket	35	EA	1.20	50	21.12			11.30		$1,060		$410		$1,470
D	12. Install 1" "T" ftg. w/cover & gasket	6	EA	1.50	11	21.12			16.60		$230		$100		$330
D	Install 2" conduit seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	6	EA	2.50	18	21.12			30.30		$380		$190		$570
D	14. Install 2" "T" ftg. w/cover & gasket	4	EA	3.00	14	21.12			46.30		$300		$190		$490
D	15. Install 3/4" conduit union "UNY"	13	EA	0.80	12	21.12			7.90		$250		$110		$360
D	16. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	17. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	18. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180

8-8113

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CONTRACTOR

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	19. Install 1/2" conduit drain	22	EA	0.20	5	21.12			25.00		$110		$560		$670
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	3700	FT	0.02	79	21.12			0.23		$1,670		$870		$2,540
D	21. Install 1pr-#16 wire termination, 300v	60	EA	0.40	28	21.12			0.30		$590		$20		$610
	Power wiring to CAMs														
D	1. Install 3/4" cond. galv. stl.	1400	FT	0.08	133	21.12			0.95		$2,810		$1,360		$4,170
D	2. Install 3/4" GRFX box	30	EA	2.20	78	21.12			32.90		$1,650		$1,010		$2,660
D	3. Install 3/4" "L" ftg. w/ cover & gasket	44	EA	1.00	52	21.12			9.90		$1,100		$450		$1,550
D	4. Install 3/4" "T" ftg. w/cover & gasket	7	EA	1.20	10	21.12			11.30		$210		$80		$290
D	5. Install 3/4" conduit union "UNY"	18	EA	0.80	17	21.12			7.90		$360		$150		$510
D	6. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	7. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	8. Install power wire 2#12 w/ #12 grd.	2000	FT	0.03	64	21.12			0.27		$1,350		$550		$1,900
D	9. Install wire term. 600v, 1/c #12	100	EA	0.20	24	21.12			0.25		$510		$30		$540
D	10. Miscellaneous and support materials	1	LOT	84.00	84	21.12			1241.00		$1,770		$1,270		$3,040
61	Radioactive & Non-Radioactive Waste Sys														
D	1. Install flex cond. assy. for mtr. up to 10hp	10	EA	12.9	153	21.12			181.00		$3,230		$1,860		$5,090
D	2. Install start-stop station factory sealed	10	EA	2.3	27	21.12			120.00		$570		$1,230		$1,800
D	3. Install 3/4" cond. galv. stl.	3500	FT	0.08	332	21.12			0.95		$7,010		$3,410		$10,420
D	4. Install 3/4" "L" ftg. w/cover & gasket	70	EA	1.00	83	21.12			9.90		$1,750		$710		$2,460
D	5. Install 3/4" conduit union "UNY"	30	EA	0.80	28	21.12			7.90		$590		$240		$830
D	6. Install 3/4" conduit seal "EYS"	11	EA	0.90	12	21.12			10.00		$250		$110		$360
D	7. Install 3/4" conduit hub	11	EA	0.80	10	21.12			4.40		$210		$50		$260
D	8. Install control wire 3#14, 600v	3650	FT	0.03	117	21.12			0.21		$2,470		$790		$3,260
D	9. Install power wire 3#12 w/ #12 grd	3650	FT	0.04	156	21.12			0.36		$3,290		$1,350		$4,640
D	10. Install wire term. 600v, 1/c#14	60	EA	0.20	14	21.12			0.20		$300		$10		$310
D	11. Install wire term. 600v, 1/c#12	80	EA	0.20	19	21.12			0.25		$400		$20		$420
D	12. Install mtr. conn. kit 600v, #14-#10	10	EA	0.50	6	21.12			12.00		$130		$120		$250
D	13. Miscellaneous and support materials	1	LOT	82.00	82	21.12			1095.00		$1,730		$1,120		$2,850
32	Stanby Electrical Sys.														
D	1. Install 4" galv. rigid stl. cond.	700	EA	0.42	349	21.12			9.50		$7,370		$6,820		$14,190
D	2. Install 4" "LBD" ftg. w/cover & gasket	28	EA	6.50	216	21.12			310.00		$4,560		$8,900		$13,460
D	3. Install 4" conduit union "UNY"	16	EA	3.00	57	21.12			140.00		$1,200		$2,300		$3,500
D	4. Install 4" conduit hub	16	EA	3.00	57	21.12			54.00		$1,200		$890		$2,090
D	5. Install wire term. 600v. 1/c #2/0	22	EA	0.80	21	21.12			3.20		$440		$70		$510

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Product Additive Sys. 44														
D	1. Install flex cond. assy. for monitors	87	EA	1.1	113	21.12			14.00		$2,390		$1,250		$3,640
D	2. Install stn. stl. box (20" x 20" x 6")	4	EA	10.3	49	21.12			630.00		$1,030		$2,580		$3,610
D	3. Install 3/4" cond. galv. stl.	2250	FT	0.08	213	21.12			0.95		$4,500		$2,190		$6,690
D	4. Install 1" cond. galv. stl.	490	FT	0.11	64	21.12			1.44		$1,350		$720		$2,070
D	5. Install 1-1/2" cond. galv. stl.	490	FT	0.14	81	21.12			2.30		$1,710		$1,160		$2,870
D	6. Install 2" cond. galv. stl.	200	FT	0.17	40	21.12			3.08		$840		$630		$1,470
D	7. Install 3/4" "L" ftg. w/cover & gasket	91	EA	1.00	108	21.12			9.90		$2,280		$920		$3,200
D	8. Install 1" "L" ftg. w/cover & gasket	15	EA	1.20	21	21.12			14.50		$440		$220		$660
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	15	EA	2.00	36	21.12			27.00		$760		$420		$1,180
D	10. Install 2" "L" ftg. w/cover & gasket	9	EA	2.50	27	21.12			42.00		$570		$390		$960
D	11. Install 3/4" "T" ftg. w/cover & gasket	107	EA	1.20	152	21.12			11.30		$3,210		$1,240		$4,450
D	12. Install 1" "T" ftg. w/cover & gasket	15	EA	1.50	27	21.12			16.60		$570		$260		$830
D	Install 2" conduit seal "EYS"	4	EA	1.60	8	21.12			30.20		$170		$120		$290
D	Install 2" conduit hub	4	EA	1.90	9	21.12			11.00		$190		$50		$240
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	15	EA	2.50	44	21.12			30.30		$930		$470		$1,400
D	14. Install 2" "T" ftg. w/cover & gasket	15	EA	3.00	53	21.12			46.30		$1,120		$710		$1,830
D	15. Install 3/4" conduit union "UNY"	34	EA	0.80	32	21.12			7.90		$680		$280		$960
D	16. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	17. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	18. Install 2" conduit union "UNY"	10	EA	1.90	23	21.12			34.40		$490		$350		$840
D	19. Install 1/2" conduit drain	66	EA	0.20	16	21.12			25.00		$340		$1,690		$2,030
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	9100	FT	0.02	194	21.12			0.23		$4,100		$2,150		$6,250
D	21. Install 1pr-#16 wire termination, 300v	174	EA	0.40	83	21.12			0.30		$1,750		$50		$1,800
53	Cooling Water System														
D	1. Install instr. flex cond. conn. assy.	4	EA	1.1	5	21.12			14.00		$110		$60		$170
D	2. Install stain. stl. 20" x 20" x 6" box	1	EA	10.30	12	21.12			630.00		$250		$650		$900
D	3. Install 3/4" conduit galv. stl.	160	FT	0.08	15	21.12			0.95		$320		$160		$480
D	4. Install 3/4" "L" ftg. w/ cover & gasket	6	EA	1.00	7	21.12			9.90		$150		$60		$210
D	5. Install 3/4" conduit union "UNY"	3	EA	0.80	3	21.12			7.90		$60		$20		$80
D	6. Install 3/4" conduit seal "EYS"	1	EA	0.90	1	21.12			10.00		$20		$10		$30
D	7. Install 3/4" conduit hub	1	EA	0.80	1	21.12			4.40		$20				$20
D	8. Install cntrl. wire str. cu 3#14	450	FT	0.02	10	21.12			0.23		$210		$110		$320
D	9. Install power wire str. cu 3#12 w/#12grd	8	EA	0.40	4	21.12			0.30		$80				$80
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		58,136	$21.10					1,226,700		940,760	1,537,510	$3,704,970

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CONTRACTOR

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Instrumentation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	SYSTEM 15														
D	1. Install pneumatic actuated valves	26	EA	6.0	185	21.12			1032		$3,910		$27,500		$31,410
D	2. Install flow/density trans. sensor	3	EA	22.0	78	21.12			14620		$1,650		$44,960		$46,610
D	3. Install level switches	12	EA	17.0	242	21.12			785		$5,110		$9,660		$14,770
D	4. Install level transmitter	4	EA	13.0	62	21.12			3153		$1,310		$12,930		$14,240
D	5. Install instr. piping for valves	26	EA	12.0	370	21.12			230		$7,810		$6,130		$13,940
D	6. Install instr. piping for transmitter	6	EA	3.0	21	21.12			92		$440		$570		$1,010
D	7. Install instr. piping for flow trans.	3	EA	12.0	43	21.12			284		$910		$870		$1,780
D	8. Install pressure switch	1	EA	7.0	8	21.12			600		$170		$620		$790
D	9. Install flow switch	1	EA	12.0	14	21.12			750		$300		$770		$1,070
D	10. Install pressure indicator	10	EA	2.0	24	21.12			230		$510		$2,360		$2,870
D	11. Install indicating transmitter/sensor	2	EA	20.0	47	21.12			3153		$990		$6,460		$7,450
D	12. Install flow indicator	8	EA	8.0	76	21.12			809		$1,610		$6,630		$8,240
D	13. Install flow switch	1	EA	12.0	14	21.12			750		$300		$770		$1,070
	SYSTEM 16														
D	1. Install pneumatic actuated valves	10	EA	6.0	71	21.12			1032		$1,500		$10,580		$12,080
D	2. Install flow/density trans. sensor	1	EA	9.0	11	21.12			7215		$230		$7,400		$7,630
D	3. Install level switches	4	EA	17.0	81	21.12			785		$1,710		$3,220		$4,930
D	4. Install level transmitter	2	EA	13.0	31	21.12			3153		$650		$6,460		$7,110
D	5. Install instr. piping for valves	11	EA	12.0	156	21.12			230		$3,290		$2,590		$5,880
D	6. Install instr. piping for transmitter	2	EA	3.0	7	21.12			92		$150		$190		$340
D	7. Install instr. piping for flow trans.	1	EA	12.0	14	21.12			284		$300		$290		$590
D	8. Install pneumatic actuated valves	1	EA	22.0	26	21.12			4648		$550		$4,760		$5,310
	SYSTEM 18														
D	1. Install pneumatic actuated valves	3	EA	6.0	21	21.12			1032		$440		$3,170		$3,610
D	2. Install flow indicator 2" - 2-1/2" line	4	EA	8.0	38	21.12			809		$800		$3,320		$4,120
D	3. Install flow indicator 4" line	3	EA	8.0	28	21.12			1905		$590		$5,860		$6,450
D	4. Install flow indicator/rotameter 5" line	1	EA	8.0	9	21.12			4385		$190		$4,490		$4,680
D	5. Install level switches	6	EA	17.0	121	21.12			785		$2,560		$4,830		$7,390
D	6. Install flow transmitter	2	EA	9.0	21	21.12			7215		$440		$14,790		$15,230
D	7. Install ph element/ transmitter	1	EA	26.0	31	20.56			1200		$640		$1,230		$1,870
D	8. Install temperature indicator/ transmitter	4	EA	11.0	52	21.12			940		$1,100		$3,850		$4,950
D	9. Install instr. piping for valves	7	EA	12.0	100	21.12			230		$2,110		$1,650		$3,760
D	10. Install temperature indicator	9	EA	4.0	43	21.12			175		$910		$1,610		$2,520

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Instrumentation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	SYSTEM 18														
D	11. Install instr. pipe for flow transmitter	2	EA	12.0	28	21.12			284		$590		$580		$1,170
D	12. Install pressure indicator	6	EA	2.0	14	21.12			230		$300		$1,410		$1,710
D	13. Install pressure safety valve 24"	1	EA	40.0	47	21.12			20000		$990		$20,500		$21,490
D	14. Install isokin air sampler-off gas stack	1	EA	60.0	71	21.12			30000		$1,500		$30,750		$32,250
D	15. Install pneum. actuated valve 6"	1	EA	12.0	14	21.12			1268		$300		$1,300		$1,600
D	16. Install pneum. actuated valve 1" - 4"	3	EA	6.0	21	21.12			1032		$440		$3,170		$3,610
	SYSTEM 20														
D	1. Install radon control instrumentation	1	LOT	121.0	143	21.12			9064		$3,020		$9,290		$12,310
	SYSTEM 44														
D	1. Install pneum. act. valve 1-1/2" - 4" gate	6	EA	6.0	43	21.12			1032		$910		$6,350		$7,260
D	2. Install bindicator level switch	18	EA	11.0	235	21.12			900		$4,960		$16,610		$21,570
D	3. Install level switch high	2	EA	17.0	40	21.12			785		$840		$1,610		$2,450
D	4. allow for instrument pipe for pneum. vlv.	6	EA	12.0	85	21.12			230		$1,800		$1,410		$3,210
	SYSTEM 53														
D	1. Install pressure indicator	1	EA	2.0	2	21.12			230		$40		$240		$280
D	2. Install temperature transmitter	1	EA	11.0	13	21.12			940		$270		$960		$1,230
	SYSTEM 90														
D	1. Install distribution control sys.	1	EA	225.0	267	21.12			282000		$5,640		$289,050		$294,690
D	2. Install control software	1	EA			21.12			126500				$129,660		$129,660
	SYSTEM 92														
D	1. Install fire alarm & evac sys.	1	EA	150.0	178	21.12			30000		$3,760		$30,750		$34,510
	SYSTEM 93														
D	1. Install real time SOx monitor	1	EA	12.0	14	21.12			12650		$300		$12,970		$13,270
D	2. Install hps control station	1	EA	18.0	21	21.12			27000		$440		$27,680		$28,120
D	3. Install auto radio counter	2	EA	24.0	57	21.12			36000		$1,200		$73,800		$75,000
D	4. Install isokin. air sampler	2	EA	60.0	142	21.12			30000		$3,000		$61,500		$64,500
D	5. Install radon working lvl monitor	9	EA	12.0	128	21.12			11000		$2,700		$101,480		$104,180
D	6. Install body frisker	3	EA	20.0	71	21.12			42000		$1,500		$129,150		$130,650
D	7. Install air sampling station (CAM)	12	EA	4.0	57	21.12			1900		$1,200		$23,370		$24,570
D	8. Install tool comtam. monitor	2	EA	10.0	24	21.12			19000		$510		$38,950		$39,460
D	**Install leak detection**	14	EA	21.5	357	21.12			901.5		$7,540		$12,940		$20,480
D	**Install HVAC controls**	34	EA	8.0	322	21.12			925		$6,800		$32,240		$39,040
D	**Install non-process instruments**	1	LOT	525.0	622	21.12			115080		$16,500		$117,960		$134,460
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		5,061	$21.77					110,200		1,376,200		$1,486,400

CONTRACTOR

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DETAIL ESTIMA.. WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	800 - Paint / Insulation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	1. Paint steel	126010	SF	0.02	2241	22.18			0.11		$49,710		$14,210		$63,920
D	2. Paint gyp. board	32630	SF	0.01	464	22.18			0.09		$10,290		$3,010		$13,300
D	3. Paint single doors	66	EA	2.70	211	22.18			5.85		$4,680		$400		$5,080
D	4. Paint double doors	20	EA	5.40	128	22.18			11.70		$2,840		$240		$3,080
D	5. Coat masonry	70575	SF	0.02	1673	22.18			0.39		$37,110		$28,210		$65,320
D	8. Paint equipment	13150	SF	0.02	234	22.18			0.11		$5,190		$1,480		$6,670
D	1. Painting bulk	1	LOT	1375	1630	22.18			7630		$36,150		$7,820		$43,970
D	2. Insulation bulk	1	LOT	2465	2923	22.18			35590		$64,830		$36,480		$101,310
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		9,504	$22.18					210,800		91,900		$302,700

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CONTRACTOR

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	AAA - Mobilization	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	ALIGNMENT & PROJECT MEETINGS														
	(5) MEETINGS, 2 DAYS EACH for (7) People														
	TRAVEL - AIR FARE	35.0	TRIPS					$1,000.00				$35,000			$35,000
	CAR RENTAL - (2) CARS PER TRIP @ (2) DAYS EA	20.0	DAYS					$50.00				$1,000			$1,000
	GASOLINE - 200 mi./TRIP/CAR	2,000.0	MI					$1.45				$2,900			$2,900
	CAR LEASING - (2) CARS	2.0	CARS					$12,000				$24,000			$24,000
	PER DIEM -	70.0	PD					$96.00				$6,720			$6,720
	LABOR @ 8 HRS /DAY	560.0	MH	1.0	560	$75.00					$42,000				$42,000
	RELOCATION														
	HOUSEHOLD MOVE & TRAVEL FY98 REPLAN	10	PEOPLE					$45,000				$450,000			$450,000
	EXPENSE FY98 REPLAN	10	PEOPLE					$15,000				$150,000			$150,000
	TOTAL COST for ALIGNMENT	1	LS								$42,000	$669,620			$711,620
	HEALTH & SAFETY PLAN - PRE OPERATIONAL														
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	TOTAL - HEALTH $ SAFETY	1	LS		240						$18,000				$18,000
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		800	$75.00					60,000	669,600			$729,600

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COST IMPAC[illegible]ATRIX SHEET

Estimate No.: C4981003
Project: Silos 1 & 2 Joule Heated Vitrify (FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 25-Oct-99
Estimator: J. ELLIS
Location: Fernald

Base Estimate Total $52,235,530	Cost Element: Civil & Excav. All Facilities Labor		Cost Element: Material		Cost Element: PPE(Material)		Cost Element: Concrete All Facilities Labor		Cost Element: Material		Cost Element: Structural Steel - All Facilities Labor	
Cost Drivers	Base $	$484,460	Base $	$156,880	Base $	$73,590	Base $	$3,375,330	Base $	$1,222,080	Base $	$922,430
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	15%					-1%	15%			-1%	15%
Material Pricing			-1%	10%	-1%	15%			-1%	10%		
Contamination	-1%	10%					0%	10%				
Technology												
Regulations/Laws					-1%	10%						
Quantity Variation	-1%	10%	-1%	15%			-1%	10%	-1%	10%		
Project Definition	-1%	10%					-1%	5%			-1%	10%
Other												
Range - %	-4%	45%	-2%	25%	-2%	25%	-3%	40%	-2%	20%	-2%	25%
Range - $	$465,082	$702,467	$153,742	$196,100	$72,118	$91,988	$3,274,070	$4,725,462	$1,197,638	$1,466,496	$903,981	$1,153,038
Distribution	UNIFORM		U		U		U		U		UNIFORM	
Correlation Rank												

[illegible]	Cost Element: Structural Steel All Fac. Material		Cost Element: Arch./Builds./Finishes-All Fac. Labor		Cost Element: Arch./Builds./Finishes-All Fac. Material		Cost Element: Equipment Systems 15 - 94 Labor		Cost Element: Equipment		Cost Element: Piping Labor	
Cost Drivers	Base $	$1,345,670	Base $	$1,661,280	Base $	$1,750,230	Base $	$1,564,230	Base $	$28,169,830	Base $	$714,830
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			-1%	15%			-1%	20%			-1%	10%
Material Pricing	-1%	10%			0%	10%			-1%	20%		
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	-1%	10%			-1%	10%			-1%	10%	0%	5%
Project Definition			-1%	15%			-1%	15%	-1%	10%	0%	5%
Other												
Range - %	-2%	20%	-2%	30%	-1%	20%	-2%	35%	-3%	40%	-1%	20%
Range - $	$1,318,757	$1,614,804	$1,628,054	$2,159,664	$1,732,728	$2,100,276	$1,532,945	$2,111,711	$27,324,735	$39,437,762	$707,682	$857,796
Distribution	UNIFORM		U		U		U		U		UNFORM	
Correlation Rank												

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Analyst: _____

Client: _____

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COST IMPAC .ATRIX SHEET

Estimate No.: C4981003
Project: Silos 1 & 2 Joule Heated Vitrify (FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 25-Oct-99
Estimator: J. ELLIS
Location: Fernald

[redacted]	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Piping Material		Electrical Labor		Electrical Material		Electrical Equipment		Instrumentation Labor		Instrumentation Material	
Cost	Base $	$516,520	Base $	$3,101,080	Base $	$1,318,290	Base $	$2,030,040	Base $	$275,630	Base $	$1,928,480
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			-1%	10%					-1%	10%		
Material Pricing	-1%	15%			-1%	10%	-1%	20%			0%	15%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	10%			0%	10%	-1%	10%			0%	5%
Project Definition			0%	10%			0%	10%	0%	5%	0%	5%
Other												
Range - %	-1%	25%	-1%	20%	-1%	20%	-2%	40%	-1%	15%	0%	25%
Range - $	$511,355	$645,650	$3,070,069	$3,721,296	$1,306,107	$1,581,948	$1,989,439	$2,842,056	$272,874	$316,975	$1,928,480	$2,410,600
Distribution	UNIFORM		U		U		U		U		UNIFORM	
Correlation Rank												

[redacted]	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Paint / Insulation Labor		Paint / Insulation Material		Mobilization Labor		Mobilization S/C		Civil & Excav. All Fac. Equipment			
Cost	Base $	$527,250	Base $	$128,780	Base $	$150,070	Base $	$805,610	Base $	$12,940	Base $	$0
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	0%	10%			-1%	15%	0%	10%				
Material Pricing			-1%	10%					-1%	10%		
Contamination												
Technology												
Regulations/Laws												
Quantity Variation									0%	10%		
Project Definition	0%	5%	0%	5%	-1%	5%	-1%	10%				
Other												
Range - %	0%	15%	-1%	15%	-2%	20%	-1%	20%	-1%	20%	0%	0%
Range - $	$527,250	$606,338	$127,492	$148,097	$147,069	$180,084	$797,554	$966,732	$12,811	$15,528	$0	$0
Distribution	UNIFORM		U									
Correlation Rank												

Analyst: _____

Client: _____

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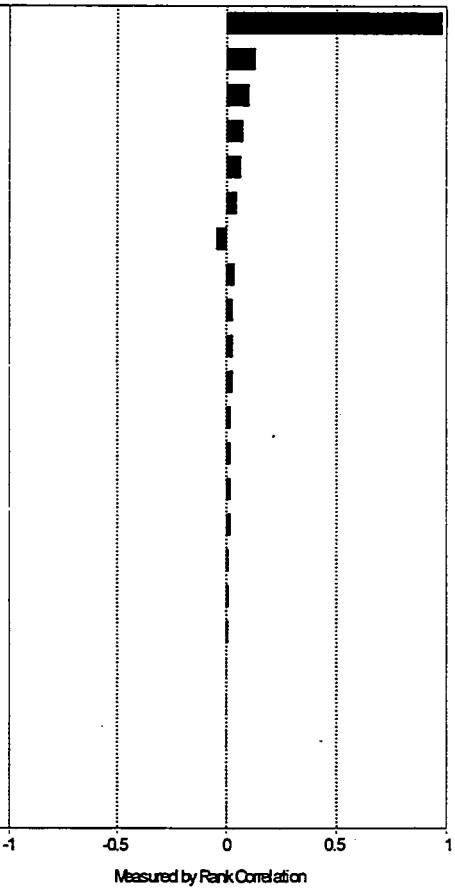
Crystal Ball Report

Sensitivity Chart

Target Forecast: Capital Joule Vit 2

cost element # 11	.98
cost element # 04	.13
cost element # 16	.10
cost element # 14	.07
cost element # 08	.07
cost element # 09	.05
cost element # 17	-.05
cost element # 12	.04
cost element # 07	.03
cost element # 10	.03
cost element # 06	.03
cost element # 15	.03
cost element # 05	.03
cost element # 23	.02
cost element # 01	.02
cost element # 22	.02
cost element # 18	.02
cost element # 20	.01
cost element # 02	-.01
cost element # 21	-.01
cost element # 19	.00
cost element # 13	-.00
cost element # 03	.00



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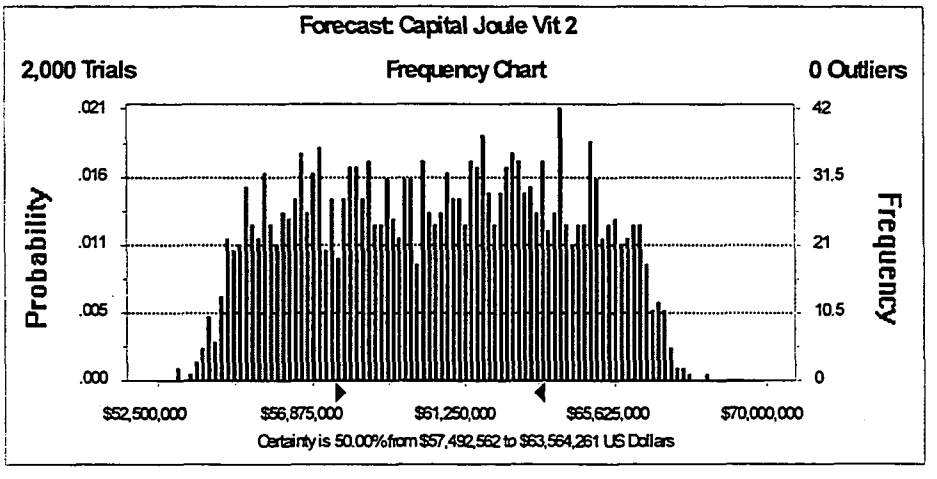
Forecast: Capital Joule Vit 2 **Cell: C52**

Summary:

Certainty Level is 50.00%
Certainty Range is from $57,492,562 to $63,564,261 US Dollars
Display Range is from $52,500,000 to $70,000,000 US Dollars
Entire Range is from $53,063,252 to $68,318,483 US Dollars
After 2,000 Trials, the Std. Error of the Mean is $80,573

Statistics:	Value
Trials	2000
Mean	$60,582,526
Median	$60,712,311
Mode	---
Standard Deviation	$3,603,312
Variance	1E+13
Skewness	-0.02
Kurtosis	1.88
Coeff. of Variability	0.06
Range Minimum	$53,063,252
Range Maximum	$68,318,483
Range Width	$15,255,231
Mean Std. Error	$80,572.51



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Forecast: Capital Joule Vit 2 (cont'd) **Cell: C52**

Percentiles:

Percentile			US Dollars
0.0%			$53,063,252
2.5%			$54,499,019
5.0%			$54,923,092
50.0%	Risk Budget	16.2%	$60,712,311
95.0%			$66,220,461
97.5%			$66,626,703
100.0%			$68,318,483

End of Forecast

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RISK ANALYSIS INPUT DATA TABLE

Capital Joule Vit 2 Estimate No.:C4981003 8113

Item No.	Cost Element Description	Estimated Base $	Distribution Range Width Low %	Low $	High %	High $	Dist. Type	Corr. Rank
01	cost element # 01	$484,460	-4%	$465,082	45%	$702,467	U	-
02	cost element # 02	$156,880	-2%	$153,742	25%	$196,100	U	-
03	cost element # 03	$73,590	-2%	$72,118	25%	$91,988	U	-
04	cost element # 04	$3,375,330	-3%	$3,274,070	40%	$4,725,462	U	-
05	cost element # 05	$1,222,080	-2%	$1,197,638	20%	$1,466,496	U	-
06	cost element # 06	$922,430	-2%	$903,981	25%	$1,153,038	U	-
07	cost element # 07	$1,345,670	-2%	$1,318,757	20%	$1,614,804	U	-
08	cost element # 08	$1,661,280	-2%	$1,628,054	30%	$2,159,664	U	-
09	cost element # 09	$1,750,230	-1%	$1,732,728	20%	$2,100,276	U	-
10	cost element # 10	$1,564,230	-2%	$1,532,945	35%	$2,111,711	U	-
11	cost element # 11	$28,169,830	-3%	$27,324,735	40%	$39,437,762	U	-
12	cost element # 12	$714,830	-1%	$707,682	20%	$857,796	U	-
13	cost element # 13	$516,520	-1%	$511,355	25%	$645,650	U	-
14	cost element # 14	$3,101,080	-1%	$3,070,069	20%	$3,721,296	U	-
15	cost element # 15	$1,318,290	-1%	$1,305,107	20%	$1,581,948	U	-
16	cost element # 16	$2,030,040	-2%	$1,989,439	40%	$2,842,056	U	-
17	cost element # 17	$275,630	-1%	$272,874	15%	$316,975	U	-
18	cost element # 18	$1,928,480	0%	$1,928,480	25%	$2,410,600	U	-
19	cost element # 19	$527,250	0%	$527,250	15%	$606,338	U	-
20	cost element # 20	$128,780	-1%	$127,492	15%	$148,097	U	-
21	cost element # 21	$150,070	-2%	$147,069	20%	$180,084	U	-
22	cost element # 22	$805,610	-1%	$797,554	20%	$966,732	U	-
23	cost element # 23	$12,940	-1%	$12,811	20%	$15,528	U	-
24				$0		$0		
25				$0		$0		
26				$0		$0		
27				$0		$0		
28				$0		$0		
29				$0		$0		
30				$0		$0		
31				$0		$0		
32				$0		$0		
33				$0		$0		
34				$0		$0		
35				$0		$0		
36				$0		$0		
37				$0		$0		
38				$0		$0		
39				$0		$0		
40				$0		$0		
41				$0		$0		
42				$0		$0		
43				$0		$0		
44				$0		$0		
45				$0		$0		
Total	Capital Joule Vit 2	$52,235,530		$51,001,032		$70,052,866		

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C.2.3 Engineering Cost Estimate

C.2.3.1 Summary

Engineering cost is the cost of design (preliminary design, detailed design and supporting documentation, and construction field support); it is calculated as an estimated FTE by discipline. The engineering rate of $70.00 per manhour ($70.00/mhr) is based on a subcontract architectural and engineering (A/E) firm performing the engineering activities.

The engineering cost for the Vitrification — Joule-heated facility design and labor support is summarized in **Table C.2.3-1**.

TABLE C. 2.3-1
ENGINEERING COST SUMMARY FOR VITRIFICATION — JOULE-HEATED

Engineering Manhours (mhr)	357,870
Engineering Labor Rate ($1/mhr)	$70
Estimated Engineering Cost	$25,050,900

C.2.3.2 Attachment

The engineering cost estimate summary by discipline for the Vitrification – Joule-heated (VIT1) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.2.3.I

Engineering Cost Estimate Summary for

Vitrification – Joule-heated

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
4	Conceptual Design Phase @ 25 wks duration														
	Process Engineer	7	EA	998.4	6989	70.00					$489,220				$489,220
	Mechanical Engineer	4	EA	998.4	3994	70.00					$279,550				$279,550
	Electrical Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Piping Engineer	6	EA	998.4	5990	70.00					$419,330				$419,330
	I & C Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Structural Engineer		EA	998.4		70.00									
	Civil Engineer		EA	998.4		70.00									
	HVAC Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Cost/ Scheduler	3	EA	998.4	2995	70.00					$209,660				$209,660
	Operations Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Clerical Administration	1	EA	998.4	998	16.50					$16,470				$16,470
	Construction Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	TOTAL for Conceptual Design	1	LS		27955						1903460				$1,903,460
	Preliminary Design Phase @ 42 wks duration														
	Process Engineer	12	EA	1685.0	20220	70.00					$1,415,400				$1,415,400
	Mechanical Engineer	8	EA	1685.0	13480	70.00					$943,600				$943,600
	Electrical Engineer	3	EA	1685.0	5055	70.00					$353,850				$353,850
	Piping Engineer	10	EA	1685.0	16850	70.00					$1,179,500				$1,179,500
	I & C Engineer	5	EA	1685.0	8425	70.00					$589,750				$589,750
	Structural Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Civil Engineer	1.5	EA	1685.0	2528	70.00					$176,930				$176,930
	HVAC Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Cost/ Scheduler	6	EA	1685.0	10110	70.00					$707,700				$707,700
	Operations Manager	1	EA	1685.0	1685	70.00					$117,950				$117,950
	Project Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Project Manager	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Clerical Administration	3	EA	1685.0	5055	16.50					$83,410				$83,410
	Construction Engineer	1	EA	1685.0	1685	70.00					$117,950				$117,950
	TOTAL for Preliminary Design	1	LS		98573						6629640				$6,629,640

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
4	Final Design Phase @ 52 wks duration														
	Process Engineer	7	EA	2080.0	14560	70.00					$1,019,200				$1,019,200
	Mechanical Engineer	10	EA	2080.0	20800	70.00					$1,456,000				$1,456,000
	Electrical Engineer	6	EA	2080.0	12480	70.00					$873,600				$873,600
	Piping Engineer	12	EA	2080.0	24960	70.00					$1,747,200				$1,747,200
	I & C Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Structural Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Civil Engineer	2	EA	2080.0	4160	70.00					$291,200				$291,200
	HVAC Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Cost/ Scheduler	8	EA	2080.0	16640	70.00					$1,164,800				$1,164,800
	Operations Manager	2	EA	2080.0	4160	70.00					$291,200				$291,200
	Project Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Project Manager	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Clerical Administration	5	EA	2080.0	10400	16.50					$171,600				$171,600
	Construction Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	TOTAL for Final Design	1	LS		151840						10072400				$10,072,400
	Construction Design Phase @ 134 wks duration														
	Process Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Mechanical Engineer	4	EA	5360.0	21440	70.00					$1,500,800				$1,500,800
	Electrical Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Piping Engineer	2	EA	5360.0	10720	70.00					$750,400				$750,400
	I & C Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Structural Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Civil Engineer		EA	5360.0		70.00									
	HVAC Engineer		EA	5360.0		70.00									
	Cost/ Scheduler	3	EA	5360.0	16080	70.00					$1,125,600				$1,125,600
	Operations Manager		EA	5360.0		70.00									
	Project Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Project Manager	2	EA	5360.0	10720	70.00					$750,400				$750,400
	Clerical Administration	5	EA	5360.0	26800	16.50					$442,200				$442,200
	TOTAL for Construction	1	LS		112560						6445400				$6,445,400
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		390,928	$64.08					25,050,900				$25,050,900

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C.2.4 Operation and Maintenance Estimate Basis: Vitrification – Joule-heated

C.2.4.1 Introduction

The O&M costs for the Vitrification — Joule-heated (VIT1) alternative are summarized in **Table C.2.4-1**.

The O&M costs were prepared as detailed estimates based on **the Basis of Design and Description (Appendix G)**, POP testing data **(Appendix H)**, and O&M experience at the FEMP.

TABLE C. 2.4-1
OPERATION AND MAINTENANCE COST ESTIMATE FOR VITRIFICATION — JOULE-HEATED

FDF Labor Costs	
FDF O&M Labor Cost	$63,902,380
FDF Start-up Labor Cost	$9,128,910
Material Costs	
Spare Parts Cost	$1,192,440
Consumable (PPE and Supplies) Cost	$8,625,570
Contractor Technical Support Costs	
Contractor Operation Support Cost	$1,439,870
Contractor Start-up Support Cost	$2,109,000
Other Costs	
Secondary Waste	$1,059,650
Utilities Cost	$5,917,380
Risk Budget	$40,479,120
Total O&M Cost	$133,854,320

C.2.4.2 Estimate Basis

The cost estimate basis for the O&M cost for the Vitrification – Joule-heated alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.2.4.2.1 Assumptions

The following general assumptions were used in the preparation of the estimates:

1. Costs are expressed in FY99 dollars.
2. FDF O&M labor is based on the FY99 FAT&LC contract and labor classifications.
3. During operations and start-up, FDF O&M labor is dedicated 100% to supporting the Silos 1 and 2 material full-scale remediation project. All other remediation activities on the site will have been completed in FY06.
4. Labor costs are based on four crews working a 48-hr/week schedule to operate and maintain a 24-hr/day, 7-days/week operation schedule.
5. Silos 1 and 2 material full-scale treatment facility has a designed operational availability of 70%.
6. The O&M staff is 100% dedicated in support of training and start-up of the Silos 1 and 2 material full-scale treatment facility. Training and start-up takes 6 months to complete.
7. Proof of Process testing (surrogate operations) is scheduled for 6 months after completion of start-up and before full-scale operation. The O&M staff is dedicated 100% to supporting the surrogate operations.

Table C.2.4-2 summarizes the labor staffing requirements to support the Vitrification — Joule-heated O&M activities.

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TABLE C. 2.4-2
OPERATION AND MAINTENANCE LABOR ESTIMATE
VITRIFICATION —JOULE-HEATED

	SHIFT				
POSITION	FIRST	SECOND	THIRD	FOURTH	TOTAL
Plant Manager	1				1
Clerical	1				1
Procurement	1				1
Material Control & Accountability	1	1	1	1	4
Engineering Manager	1				1
Plant Engineer	1				1
Process Engineers	1	1	1	1	4
Waste Planners	3	3	3	3	12
Conduct of Operations	1	1	1	1	4
Safety Manager	1				1
Safety Engineer	1	1	1	1	4
Radiological Technicians	5	5	5	5	20
Industrial Hygiene	1	1	1	1	4
Operations Manager	1				1
Clerical	1	1			2
Shift Supervisors	2	2	1	1	6
Control Room Operators	3	3	3	3	12
Retrieval Operators	3	3			6
Feed Preparation Operators	3	3	3	3	12
Vitrifier Operator	2	2	2	2	8
Off-gas System Operators	2	2	2	2	8
Container Handlers	3	3	3	3	12
Roving Operators	1	1	1	1	4
Laboratory Technicians	3	3	3	3	12
Motor Vehicle Operators	2	2	2	2	8
Sattelite Clothing Area Ops	3	2			5
Maintenance Manager	1				1
Maintenance Clerical	1				1
Maintenance Supervisors	2	2	1	1	6
Maintenance Planner	2				2
Maintenance Scheduler	1				1
CMMS Administrator	1				1
Data Entry Clerk	1				1
Maintenance Work Order Preparers	2				2
Automated Work Package Programmer	1				1
Electricians	3	2	2	2	9
Mill Wrights	2	2	2	2	8
Instrument Mechanics	2	2	2	2	8
Pipe Fitters	2	2	2	2	8
Welders	2				2
Laborers	2				2
Oiler	1				1
DOP Crew (part-time)	7				7
Measure & Testing Equip. Crew (part-time)	4				4
Crane Crew (part-time)	4				4
Totals	89	50	42	42	223

C.2.4.2.2 Inclusions

The O&M cost estimate includes the following elements:

- Start-up labor;
- O&M labor;
- Proof of process labor;
- Waste packaging labor;
- Start-up, proof of process, and operation consumables;
- Start-up, proof of process, and operation utilities;
- Spare parts;
- O&M of the RCS and the TTA; and
- Silos 1 and 2 material full-scale remediation contractor's technical over-sight during start-up, proof of process, and operation activities.

C.2.4.2.3 Exclusions

The following elements of cost are excluded from the O&M cost estimate:

- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation project management cost; and
- Cost of FEMP project management oversight.

C.2.4.2.4 Format and Coding

The O&M cost estimates are compiled and summarized into the following cost centers:

- FDF labor,
- FDF O&M labor,
- FDF start-up,
- Material,

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- Spare parts,
- Consumables,
- Utility,
- Contractor's technical support,
- O&M support,
- Start-up support, and
- Risk budget.

The following discussion provides a brief description of the cost centers.

C.2.4.2.4.1 FDF Labor Cost

FDF labor cost includes the costs for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

The FDF labor cost, summarized in **Table C.2.4-3**, is based on the following:

- FDF O&M labor force in **Table C.2.4-2** operates on a 24-hr/day, 7-day/week schedule;
- 0.5 years of start-up/training that uses the FDF O&M labor force (100% dedication to project); and
- 4.0 years total of O&M labor consisting of 0.5 years of start-up/training, 0.5 years of Proof of Process testing and 3.0 years of process operations to treat the Silos 1 and 2 material.

TABLE C. 2.4-3
SUMMARY OF FDF LABOR COST

Start-up FDF Labor Cost	0.5 years @ $18,257,824	$9,128,910
O&M FDF Labor Cost	3.5 years @ $18,257,824	$63,902,380
Total	4.0 years @ $18,257,824	$73,031,290

C.2.4.2.4.2 Material Cost

Material cost includes the costs for consumables (PPE, chemicals, filters office supplies, etc.), and equipment spare and replacement parts.

The following **Table C.2.4-4** is a summary of the annual cost for consumables and spare parts data based on information from the *EnVitCo POP Final Report* **(Appendix H, Attachment H1)** and the **Basis of Design and Description (Appendix G)**.

TABLE C. 2.4-4
ANNUAL CONSUMABLE AND SPARE PARTS COST DATA

Spare Parts	$297,352	per year
Consumables		
Glass Additives	$1,008,690	per year
Molybdenum Electrodes	$146,000	per year
Filter elements	$15,600	per year
Laboratory	$77,000	per year
PPE and supplies	$666,153	per year
Total	$2,210,795	per year

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Therefore, the total material cost is summarized in **Table C.2.4-5** as follows:

TABLE C. 2.4-5
SUMMARY OF MATERIAL COSTS

Material	Expenditure	Cost
Spare Parts	$297,352 @ 4.0 years	$1,189,408
Consumables	$1,914,203 @ 4.0 years	$7,656,804
Total	$2,211,553 @ 4.0 years	$8,846,212

C.2.4.2.4.3 Utility Cost

Utility cost is the cost for utilities to support the start-up, proof of process, and operation of the Silos 1 and 2 material full-scale remediation activities. This cost includes electricity, natural gas, and oxygen. Cost of water is included in the FEMP site support cost, which is not included in this estimate.

The following **Table C.2.4-6** is a summary of the annual cost for utilities based on information from the *EnVitCo POP Final Report* **(Appendix H, Attachment H1)** and **the Basis of Design and Description (Appendix G).**

TABLE C. 2.4-6
ANNUAL UTILITY COST FOR VITRIFICATION – JOULE-HEATED

Electrical	24,655,742 kWhr	@.06/kWhr	$1,479,345	per year

Based on the Vitrification – Joule-heated operation and start-up schedule assumptions, the utility costs are summarized in **Table C.2.4-7**.

TABLE C. 2.4-7
UTILITY COST FOR VITRIFICATION — JOULE-HEATED

O&M	$1,479,345 @ 3.5 years	$5,177,708
Start-up and Training	$1,479,345 @ 0.5 years	$739,672
Total Utility Cost	$1,479,345 @ 4.0 years	$5,917,380

C.2.4.2.4.4 Contractor's Technical Support Cost

The contractor's technical support cost includes the contractor's cost to support start-up and operation of the Silos 1 and 2 material full-scale treatment facility. This cost includes technology-specific laboratory support, training support labor, start-up technical oversight labor, and operational technical oversight labor.

The contractor's estimated technical support cost for Vitrification – Joule-heated is based on the *EnVitCo POP Final Report* **(Appendix H); it is** summarized in **Table C.2.4-8** as follows:

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TABLE C. 2.4-8
CONTRACTOR'S TOTAL TECHNICAL SUPPORT COSTS FOR VITRIFICATION — JOULE-HEATED

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Contractor Support for O&M	$1,439,870
Contractor Support for Start-up Cost	$2,109,000
Total Technical Support Cost	$3,548,870

C.2.4.2.4.5 Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the O&M of the Silos 1 and 2 material full-scale treatment facility.

C.2.4.2.4.6 Secondary Waste Cost

Secondary waste cost is defined as those costs accrued for the treatment, sizing, packaging, transportation and disposal of the solid secondary waste generated during Silos 1 and 2 waste remediation operations.

C.2.4.2.5 Methodology

The methods used to prepare the O&M cost estimate are discussed next.

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using the basis of design, preconceptual design drawings, and the technical judgement of senior FDF operation, maintenance, and waste management supervisory personnel. The FY99 plan labor rates were then applied to the estimated labor resources to obtain the FDF O&M labor cost estimate.

Material Cost

The material (consumables and spare parts) cost estimate is based on information provided by the POP contractor's final report.

Utility Cost

The utility costs estimate is based on information provided by the POP contractor's final report.

Contractor's Technical Support Cost

The contractor's technical support cost estimate is based on information provided by the POP contractor's final report.

Risk Budget

Risk budget is the cost allowance for risk and uncertainties associated with the O&M of the Vitrification — Joule-heated facility. The risk budget was developed following analyses of probable schedule delays based on technology experience and professional judgement (see **Table C.2.4-9**).

The O&M risk budget was determined to be 33% of operation, maintenance, and project management cost. The 33% risk factor is based on an operational schedule risk of 15.9 month delays due to potential start-up problems and downtime associated with spare parts of specialized equipment.

Secondary Waste Cost

The secondary waste cost is estimated as the volume of the spare parts, filter, PPE, and components (i.e., refractory) in contact with the vitrification melt pool being considered mixed waste requiring treatment prior to disposal. The mixed waste is assumed to be packaged, treated and disposed of at a licensed facility, all other secondary waste is packaged and disposed of at the NTS.

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TABLE C. 2.4-9
OPERATION AND MAINTENANCE SCHEDULE RISK BUDGET
VITRIFICATION — JOULE-HEATED (VIT1)

Risk Activity	Schedule Delay of Risk Activity	Probability of Risk Activity
Melter replacement due to melter failure (unique hardware).	Melter replacement 15 months.	(50% x 15 = 7.5 months)
Start-up issues	Extended start-up experienced at several sites. Risk of start-up is extended an additional 6 months.	(50% x 6 = 3 months)
Feed Prep System clogging	Feed Prep System clogging (normal flushing and cleaning covered in the normal maintenance).	(50% x 2 = 1 month)
Remote handling issues	Remote handling hardware is not "off-the-shelf" standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Reduced waste loading	Reduced waste loading resulting in schedule delay 2.1 months (see detail below).	2.1 months
Total		15.9 months

VIT1 Operational Risk Factor

15.9 months of potential delay/48-month operation and start-up period = 33%.
Note: 70% operation availability addresses the minor day-to-day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Schedule Risk Budget

VIT1 assumes a reduction in waste loading from 90 wt% to 75 wt%.
Risk Budget Factor ➡ (90-75 wt%)/75 wt% ➡ 20% @ 30% probability = 6%.
Potential Schedule Delay ➡ 6% x 36 months of operation = 2.1 months.

C.2.4.2.6 References

The following references were used in preparation of the O&M cost estimate.

- *EnVitCo POP Final Report* **(Appendix H, Attachment H1)**, and
- **Basis of Design and Description (Appendix G).**

C.2.4.2.7 Attachments

Detailed O&M cost summaries for the Vitrification — Joule-heated (VIT1) alternative , prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.2.4.I

O&M Cost Estimate Summary for

Vitrification – Joule-heated

DETAIL ESTIM. E WORKSHEETS

PROJECT: C4981003
ESTIMATE NO.: Silos 1 & 2 Joule Heated Vitrify (FS)
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 18-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Operations & Maintenance Manpow	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Operations & Maintenance Manpower														
21	Manpower	1	ls	3.50			18,257,824				63,902,380				$63,902,380
26	Spare Parts	1	ls	3.50					297,353				1,040,740		$1,040,740
29	Glass Additives	1	ls	3.50					1,008,690				3,530,420		$3,530,420
29	Molybdenum Electrodes	1	ls	3.50					146,000				511,000		$511,000
29	Filter elements	1	ls	3.50					15,600				54,600		$54,600
29	Laboratory	1	ls	3.50					77,000				77,000		$77,000
25	Electrical	1	ls	3.50					1,479,345				5,177,710		$5,177,710
28	Subcontractor Oversight (ops & Ma	1	ls					1,439,870				1,439,870			$1,439,870
	O&M Startup Costs														
21	Manpower	1	ls	0.50			18,257,824				9,128,910				$9,128,910
26	Spare Parts	1	ls	0.50					303,400				151,700		$151,700
29	Glass Additives	1	ls	0.50					1,008,690				504,350		$504,350
29	Molybdenum Electrodes	1	ls	0.50					146,000				73,000		$73,000
29	Filter elements	1	ls	0.50					15,600				7,800		$7,800
29	Laboratory	1	ls	0.50					77,000				77,000		$77,000
25	Electrical	1	ls	0.50					1,479,345				739,670		$739,670
24	Startup cost	1	ls	1.00				2,109,000				2,109,000			$2,109,000
22.a	Secondary Waste to OTHER	1	ls									$576,695			$576,695
31	Secondary Waste to NTS	1	ls									$482,955			$482,955

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OPERATIONS AND MAINTENANCE MANPOWER
Vitrification - Joule Heated

POSITION	SHIFT FIRST	SECOND	THIRD	FOURTH	TOTAL	TOTAL HRS/WK	HOURS	SALARY ($/HR)	ANNUAL EXPENSE
Plant Manager	1				1	40	6240	$60.00	$124,800
Clerical	1				1	40	6240	$23.00	$47,840
Procurement	1				1	40	6240	$43.50	$90,480
Mat'l Control & Accountability	1	1	1	1	4	48	29952	$41.75	$416,832
Engineering Manager	1				1	40	6240	$65.00	$135,200
Plant Engineer	1				1	40	6240	$55.00	$114,400
Process Engineers	1	1	1	1	4	48	29952	$55.00	$549,120
Waste Planners	3	3	3	3	12	48	89856	$44.00	$1,317,888
Conduct of Operations	1	1	1	1	4	48	29952	$42.50	$424,320
Safety Manager	1				1	40	6240	$60.00	$124,800
Safety Engineer	1	1	1	1	4	48	29952	$46.00	$459,264
Radiological Technicians	5	5	5	5	20	48	149760	$33.50	$1,672,320
Industrial Hygiene	1	1	1	1	4	48	29952	$46.00	$459,264
Operations Manager	1				1	40	6240	$60.00	$124,800
Clerical	1	1			2	40	12480	$23.00	$95,680
Shift Supervisors	2	2	1	1	6	48	44928	$42.50	$636,480
Control Room Operators	3	3	3	3	12	48	89856	$30.00	$898,560
Retrieval Operators	3	3			6	48	44928	$30.00	$449,280
Feed Preparation Operators	3	3	3	3	12	48	89856	$30.00	$898,560
Vitrifier Operator	2	2	2	2	8	48	59904	$30.00	$599,040
Off-gas System Operators	2	2	2	2	8	48	59904	$30.00	$599,040
Container Handlers	3	3	3	3	12	48	89856	$30.00	$898,560
Roving Operators	1	1	1	1	4	48	29952	$29.00	$289,536
Laboratory Technicians	3	3	3	3	12	48	89856	$30.00	$898,560
Motor Vehicle Operators	2	2	2	2	8	48	59904	$30.00	$599,040
Sattelite Clothing Area Ops	3	2			5	48	37440	$30.00	$374,400
							0		
Maintenance Manager	1				1	40	6240	$60.00	$124,800
Clerical	1				1	40	6240	$23.00	$47,840
Maintenance Supervisors	2	2	1	1	6	48	44928	$42.50	$636,480
Maintenance Planner	2				2	40	12480	$42.50	$176,800
Maintenance Scheduler	1				1	40	6240	$42.50	$88,400
CMMS Administrator	1				1	40	6240	$41.00	$85,280
Data Entry Clerk	1				1	40	6240	$23.00	$47,840
Maint Work Order Preparers	2				2	40	12480	$41.00	$170,560
Automated Work Pkg Programmer	1				1	40	6240	$41.00	$85,280
Electricians	3	2	2	2	9	48	67392	$32.00	$718,848
Mill Wrights	2	2	2	2	8	48	59904	$32.00	$638,976
Instrument Mechanics	2	2	2	2	8	48	59904	$32.00	$638,976
Pipe Fitters	2	2	2	2	8	48	59904	$32.00	$638,976
Welders	2				2	40	12480	$32.00	$133,120
Laborers	2				2	40	12480	$30.00	$124,800
Oiler	1				1	40	6240	$32.00	$66,560
DOP Crew (Part Time)	7				7	28	30576	$32.00	$326,144
Meas & Test Equip Crew (Part Time)	4				4	16	9984	$32.00	$106,496
Crane Crew (Part Time)	4				4	16	9984	$32.00	$106,496
Totals	89	50	42	42	223		1,578,096		$18,260,736

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OPERATIONS CONSUMABLES AND MATERIAL COST

Spare Parts	$	297,352.81	per year
Glass Additives	$	1,008,690.00	per year
Molybdenum Electrodes	$	146,000.00	per year
Filter elements	$	15,600.00	per year
Laboratory Supplies	$	77,000.00	per year
PPE and supplies	See Attached details		per year

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Operation and Maintenance
PPE and Supplies
Calculations

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

SITE SPECIFIC

EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			70.0%	20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
	<---- MULTIPLE SHIFTS-											
WORK WEEK							4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK	////////// MULTIPLE-SHIFT //////////			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK	//////////		OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK 2ND SHIFT 3RD SHIFT			 3RD SHIFT		 2ND SHIFT		OR ONE SHIFT ONLY			 100.0% 100.0%	 3.0% 5.0%	 0.03 0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	87.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 87.4%

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.14

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EFFICIENCY FACTORS

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PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
ENT: DOE
S NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	14%	14.0
S/T = BASE UNIT MANHOURS		114
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		114
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		114

• PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	4.00%	5	71.00%	81	79.00%	90	147.00%	168	326.00%	372
AS A MULTIPLIER)/TOTAL HRS	1.04	118.6	1.71	194.9	1.79	204.1	2.47	281.6	4.26	485.6
TOTAL MULTIPLIER w/SITE PROD.	1.1856		1.9494		2.0406		2.8158		4.8564	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

12.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	49.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

..OJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.04	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDITN'L.SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING	QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS	QUANTITY	N/A	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)	MINUTES	N/A	15	15	15	15
TOTAL		0	30	30	30	45
MOBILIZATION - ROUND TRIPS	QUANTITY	N/A	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	N/A	15	15	15	15
TOTAL		0	60	60	60	60
COOLDOWNS PER DAY	QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS) 33.33%	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		575	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

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DJECT: Silos 1 & 2 Joule Heated Vitrify (FS)

ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

CAPITAL PLANT

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	4	0	$0	C / C+/ B	
SUB-TOTAL		22.18	4		$0		
				$/MD =	$0.00		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	4	0	$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	mC
SUB-TOTAL		5.98	4		$0	
				$/MD =	$0.00	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	48	$3,658	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	48	$39,600	C/B
THERMO STRIPS	EA	50.00	6	48	$14,400	C/B
SUB-TOTAL					$57,660	

MAT'L.$'s
$57,700

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

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HEALTH PHYSICS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)

TIMATE NO.: C4981003
IENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

CAPITAL PLANT
--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	124	496	$22.13	$10,980
ANNUAL PHYSICALS	1	4	124	496	$22.13	$10,980
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	124	124	$22.13	$2,740
SUB-TOTAL						$24,700

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	124	1114	$22.13	$24,640
SUB-TOTAL						$24,640

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	185	2	370	$22.13	$8,200

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	124	0.5456	339

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	0.0%	$6,442,893	$0
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	$6,442,893	$128,900

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$186,400	$57,700	$244,100

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ACTIVITY DURATIONS

8113

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	18-Dec-96	01-Jan-2000	30-Sep-2000	30-Jun-2001	18.0	MONTHS
					0	MONTHS
TOTAL					18.0	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	45.5	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
		01-Jan-2002	01-Jan-2004	01-Jan-2006	48.1	MONTHS
OPERATIONS					48.1	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

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HEALTH PHYSICS

8113

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)

ESTIMATE NOC4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P PLANT OPERATIONS

DATE: 18-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY WKR.SHFT. = 156/WK for 4.00 YR DURATION				
PPE LEVEL C / C+ / B : F/HF M		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	20211	$360,555	C / C+/ B	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	20211	$360,555	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	20211	$19,402	C / C+/ B	
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	20211	$21,019	C / C+/ B	
GLOVE, WORK - DISPOSABL	PR	1.02	4	20211	$82,459	C / C+/ B	
APR CARTRIDGES - DISPOSA	PR	11.74	4	20211	$949,085	C / C+/ B	
SUB-TOTAL		22.18	4		$1,793,075		
				$/MD =	$88.72		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVER	PR	4.46	4	40421	$721,111	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	40421	$38,804	mC
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	40421	$42,038	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	40421	$164,918	mC
SUB-TOTAL		5.98	4		$966,871	
				$/MD =	$23.92	

SUBCONTRACTOR REQUIRED	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR	PR	12.70	6	154.575	$11,779	D/C/B
APR w/HALF FACE MASK - (1	EA	22.30	6	77.2875	$10,341	C
APR w/FULL FACE MASK - (1	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	38.64375	$31,881	C/B
THERMO STRIPS	EA	50.00	6	15.4575	$4,637	C/B
SUB-TOTAL					$58,640	

MAT'L.$'s
$2,818,600

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Joule Heated Vitrify (FS)

ESTIMATE NO: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 18-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PLANT OPERATIONS
-MEDICAL MONITORING -

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	206	824	$22.13	$18,240
ANNUAL PHYSICALS	4	4	206	3298	$22.13	$72,980
EXIT (TERMINATION) PHYSIC	1	1	206	206	$22.13	$4,560
SUB-TOTAL						$95,780

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	24	1	206	4946	$22.13	$109,450
SUB-TOTAL						$109,450

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	821	2	1642	$22.13	$36,300

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	206	0.90684	905

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY	0.0%	$73,031,290	$0
WORK DELAYS CAUSED BY	1.0%	$73,031,290	$730,300

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$971,800	$2,818,600	$3,790,400

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OPERATIONS UTILITY COST

Electrical	24,655,767	.06 KW/hr	$ 1,479,346.02	per year	(See Appendix G for Details)
Water	580 gpm		Cost covered by Site Hotel Cost		
Compressed Air	2880psi/hr		Cost covered by Site Hotel Cost		
Steam	30psi/hr		Cost covered by Site Hotel Cost		
Nitrogen	120psi/hr		Cost covered by Site Hotel Cost		

Estimated Secondary Waste Streams Generated During Full-scale of the Remediation Facility for Silos 1 & 2 Project

Vitrification - Joule-Heated

Source	Material Type	Total Volume 3 Years	Packaged Disposal Volume in CF	Shipped to	No. of LMB
Empty Re-Work Containers	Solid	15,744 lbs	224	NTS	1
Misc. Replacement Equipment	Solid	435 cf	838	NTS	1
PPE	Solid	23,900 cf	35,407	NTS	35
Freight per Container to NTS	$3,453	Container(s) to NTS	37	$127,754	
Container Burial NTS	$9,600	Container(s) Burial NTS	37	$355,200	
			NTS Total	$482,954	

Source	Material Type	Total Volume 3 Years	Shipped to	Container Type	Total Dollars
Category C (Salt drain, reduced metal, refractory)	Salt / Solid	66,822 kg	other	55 gal drum	$508,526
Category C (HEPA filters, & glass drain bay)	Solid	7,649 kg	other	B-25 boxes	$68,168
				Other Total	$576,693
Total Secondary Waste Cost				$1,059,647	

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VITRIFICATION - JOULE-HEATED

The Department of Energy Oak Ridge Operations
Mixed Waste Disposal under DOE contract
DE-AC0594OR22074

Disclaimer: This should be used for cost estimation purposes only.

Category C Estimate(salt drain, reduced metals, refractory)

Material:	Debris
Weight of Material:	66822 kg
Container Type:	55 Gallon Drums
Treatment Cost:	$330,768.89
Disposal Cost:	$110,356.53
Handling Price:	$20,625.00
Transportation Cost:	$46,775.40
Total:	$508,525.82

Category C Estimate (HEPA filters & glass drain bay)

Material:	Debris
Weight of Material:	7649 kg
Container Type:	B-25 Boxes
Treatment Cost:	$46,505.92
Disposal Cost:	$12,632.32
Handling Price:	$3,675.00
Transportation Cost:	$5,354.30
Total:	$68,167.54

VIT 1 TOTAL **$576,593.36**

Estimated Secondary Waste Streams Generated During Full-scale Operation of the Remediation Facility for Silos 1 and 2 Project

Secondary Waste Streams for VIT 1					
Source	**Material Type**	**Rate (lb/hr)**	**Total Volume 3 years**	**Status**	**Packaged Disposal Volume**
Off-gas Solids	Solids	16	2,238 cf	Recycle	N/A
Scrubber Purge	Water	168	550,368 gal	Process	N/A
RCS Condensate	Water	108	353,808 gal	Process	N/A
Cooling Tower Blow Down	Water	2,610	8,550,360 gal	Process	N/A
Salt Drain	Salts	27 [1]	189 cf	Dispose	524 cf
Reduced Metals	Solid	~ 3.14	120 cf	Dispose	393 cf
Empty Re-work Containers	Solid	96 MTC's	15,744 lbs	Dispose	224 cf
Spent Refractory (5 g/cc)	Solid	1 Lot	530 cf	Dispose	1,120 cf
Glass Drain Bay	Solid	1/3 yrs	~ 106 cf	Dispose	157 cf
Misc. Replacement Equipment [2]	Solid	N/A	435 cf	Dispose	838 cf
RCS carbon	Carbon	1 Lot	5,334 cf	Dispose	8,890 cf
RCS and Off gas System HEPA Filters	Solid	N/A	1,512 cf	Dispose	2,912 cf
PPE [3]	Solid	4 /day	23,900 cf	Dispose	35,407 cf
Total Estimated Cubic Feet of Packaged Disposed Secondary Waste					50,500 cf

1 - Conservative Proof of Principle results indicated little or none produced. This estimated generated rate is the mass valance in the event a slug of silo material contains a high sulfate concentration. The estimated density of the material is 3 g/cc and the salt drain will be operated 5% of the time.
2 - Equipment will be replaced when necessary to maintain normal operation schedule.
3 - Based on the assumption of four complete changes per person per shift.

Vitrification Joule Heated (VIT 1)

Operation and Maintenance Risk Budget

Risk Activity	Schedule delay of Risk Activity	Probability of Risk Activity
Melter replacement due to melter failure. (unique hardware)	Melter replacement 15 months	(50% x 15= 7.5 months)
Startup Issues	Extended startup experienced at several sites Risk is startup is extended an additional 6 months.	(50% x 6 = 3 months)
Feed prep system clogging	Feed prep system clogging (normal flushing and cleaning covered in the normal maintenance .	(50% x 2 = 1 month)
Remote handling issues	Remote handling hardware is not off-the shelf standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Reduce waste loading	Reduce waste loading resulting in schedule delay 2.1 months see details below	2.1 months
Total		15.9 months of potential delays

Vit 1 Operational Risk Factor

15.9 months of potential delay/48 month operation and startup period = 33%

Note: 70% operation availability addresses the minor day to day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Risk Budget

Vit 1 assume a reduction in waste loading from 90wt% to 75wt%

Risk Budget Factor = 90-75/75 = 20% @ 30% probability = 6%

6% x 36 months of operation = 2.1 months of potential delays

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C.2.5 Decontamination and Demolition Estimate Basis: Vitrification – Joule-heated

C.2.5.1 Introduction

D&D costs for the Vitrification — Joule-heated (VIT1) alternative are summarized in **Table C.2.5-1.**

TABLE C. 2.5-1
D&D COST
VITRIFICATION — JOULE-HEATED

Vitrification — Joule-heated D&D Cost	$11,625,900
Silos Project Support Area D&D Cost	$10,468,800
D&D NTS Disposal Cost	$11,174,592
D&D Risk Budget	$ 1,234,400
Total D&D Cost Estimate	$ 34,503,692

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C.2.5.2 Estimate Basis

The cost estimate basis for the D&D cost of the Vitrification — Joule-heated alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.2.5.2.1 Assumptions

The following general assumptions were used in the preparation of the estimates:

1. Costs are expressed in fiscal year (FY) 1999 dollars.
2. D&D waste is sent to the NTS.
3. Labor costs are based on four crews working a 40-hr/week, 10-hr/day schedule, without any allowance for premium time.
4. Construction management staff is dedicated 100% to supporting D&D of the proposed facility.

C.2.5.2.2 Inclusions

The D&D cost estimate includes the following elements:

- Cost of demolition labor;
- Cost of FDF construction management dollars above- and below-grade;
- Waste packaging and transportation labor;
- Below-grade D&D of concrete and underground utilities;
- Above-grade D&D;
- RCS/TTA building D&D;
- FDF D&D planning & engineering;
- Equipment rental dollars; and
- Subcontractor staffing costs.

C.2.5.2.3 Exclusions

The D&D cost estimate excludes the following elements:

- Premium time cost for overtime; and
- Security, fire department, human resources, etc.

C.2.5.2.4 Format and Coding

The D&D cost estimates are compiled and summarized into the following cost centers:

- Vitrification — Joule-heated D&D;
- Silos project support area D&D;
- D&D NTS disposal; and
- D&D risk budget.

C.2.5.2.4.1 Vitrification — Joule-heated D&D Costs

This is the cost associated with the D&D of the Vitrification – Joule-heated facility. This cost estimate is based on the **Basis of Design and Description (Appendix G)** and FEMP D&D experience.

C.2.5.2.4.2 Silos Project Support Area D&D Costs

Silos project support area D&D costs include the cost for the D&D of the silo areas support facilities (TTA, RCS). This cost estimate is based on information from the AWR preconceptual design provided with the contractor's final report and FEMP D&D experience.

C.2.5.2.4.3 D&D NTS Disposal Costs

D&D NTS disposal costs are the costs for the disposal of all D&D debris from the D&D of the Vitrification – Joule-heated facility, the TTA, and RCS.

C.2.5.2.4.4 D&D Risk Budget

The D&D risk budget is a cost allowance for the risks and uncertainties associated with D&D activities. The cost risk budget for D&D is 6%, which is based on the risk analysis of other FEMP D&D projects.

C.2.5.2.5 Methodology

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with D&D of the Silos 1 and 2 material remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates. An activity-based level-of-effort support estimate was developed using preconceptual design drawings and materials of construction from the **Basis of Design and Description (Appendix G)**, and technical judgement of senior FDF D&D and waste management supervisors.

Wage Rates

Wage rates are based on project labor agreement rates, effective October 1998, and are considered FY99 dollars for estimating purposes.

Unit Rates

Unit mhrs, equipment, and material dollars are based on estimating guides and FEMP historical data rates.

Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the D&D of the Silos 1 and 2 material full-scale treatment facility.

C.2.5.2.6 References

Basis of Design and Description (Appendix G)

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C.2.5.2.7 Attachment

Detailed D&D cost summaries for the Vitrification – Joule-heated (VIT1) alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.2.5.I

D&D Cost Estimate Summary for

Vitrification – Joule-heated

ESTIMATE SUMMARY SHEET

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

8113

DATE: 17-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
Mobilization Cost	820		$17,400		$13,800	$800	$32,000
Below Grade	8,093		$163,880				$163,880
Above Grade	38,913		$787,890				$787,890
Demobilization Cost	1,780		$36,400	$8,200	$2,500	$4,900	$52,000
DIRECT FIELD COSTS TOTAL	49,606	$20.27	$1,005,570	$8,200	$16,300	$5,700	$1,035,770
SUPERVISION - CONTRACTOR & PERDIUM	17,360		$414,500	$129,600			$544,100
SMALL TOOLS & CONSUMABLES 3%					$30,200		$30,200
EQUIP. RENTAL (See Equipment Schedule)						$705,600	$705,600
TEMPORARY FACILITIES 6%	1,488		$30,200		$30,200		$60,400
TEMPORARY UTILITY HOOK-UP 3%	967		$19,600		$10,600		$30,200
JOB CLEAN-UP 6%	2,232		$45,300		$15,100		$60,400
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)							
HEALTH PHYSICS S/C	2,116		$42,900		$161,800		$204,700
CERCLA - 40 HRs/FTE	1,250		$25,300				$25,300
GET/SITE ACCESS & JOB SPECIFIC TRAINING	900		$18,200				$18,200
PAYROLL BURDENS & BENEFITS 57%	-	-	$912,900				$912,900
OVERHEAD & PROFIT 20%	-	-		$725,600			$725,600
BOND 1%	-	-		$43,500			$43,500
SALES TAX 6%	-	-			$15,900	$42,700	$58,600
INDIRECT FIELD COSTS TOTAL	26,314		$1,508,900	$898,700	$263,800	$748,300	$3,419,700
DIRECT & INDIRECT FIELD COSTS TOTAL	75,920	$33.12	$2,514,470	$906,900	$280,100	$754,000	$4,455,470
WASTE DISPOSITION MGMT. - FD FERNALD			$969,362	$1,622,844	$2,372,905	$38,568	$5,003,680
OFF-SITE DISPOSAL COSTS (Commercial)							
WASTE MANAGEMENT COSTS TOTAL			$969,362	$1,622,844	$2,372,905	$38,568	$5,003,680
PROJECT CLOSE OUT			$85,826	$15,076			$100,902
FIELD PREPARATION							
CONSTRUCTION MANAGEMENT - FD FERNALD			$1,586,389	$157,760	$35,834		$1,779,984
FD FERNALD FIELD SUPPORT COSTS TOTAL			$1,672,215	$172,837	$35,834		$1,880,886
ENGINEERING/DESIGN/INSPECTION - FD FERNALD			$124,815	$9,718	$6,826		$141,359
ENGINEERING COSTS TOTAL			$124,815	$9,718	$6,826		$141,359
SALES TAX - FD FERNALD							$144,500
SUB-TOTAL (BASE ESTIMATE)							$11,625,900
RISK BUDGET 9.7%							$1,127,700
TARGET ESTIMATE (FY99 DOLLARS)							$12,753,600
CONTINGENCY 10.9%							$1,267,200
NTS BURIAL FEE							$4,512,078

ESTIMATE PERFORMED BY ESTIMATING SERVICES .

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ESTIMATE SUMMARY SHEET

PROJECT: Vit 2 D&D Joule Heated Vitrification
DATE: 17-Aug-99
ESTIMATE NO.: C4981202R2
ESTIMATOR: Wagner
CLIENT: DOE
LOCATION: FERNA[illegible]
WBS NO.: 2.1.3.G.P
TASK NO.: 4S11B[illegible]

FACTORS

FIXED PRICE SUBCONTRACT	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOT[illegible]
DFC DOLLARS	$1,005,570	$8,200	$16,300	$5,700	$161,800	$1,197,570
IFC COST FACTOR	2.5005	16.8049	6.2822	124.7895	--	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2086	1.2086	1.2086	1.2086	1.2086	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	3.0222	20.3109	8.0485	159.8742	1.2812	
BASE ESTIMATE $'s	$3,039,072	$166,550	$131,190	$911,283	$207,290	$4,455,385
RISK BUDGET FACTOR	1.0970	1.0970	1.0970	1.0970	1.0970	
TARGET ESTIMATE FACTOR	3.3154	22.2811	8.8292	175.3820	1.4054	
FPS TARGET ESTIMATE (FY99 DOLLARS)	$3,333,863	$182,705	$143,915	$999,677	$227,397	$4,887,558

NOTE:
1.)The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe. SEE De-Escalated Summary.
2.) If there are no DFC Equip. S, enter The IFC Equip. $'s into the direct field cost TOTAL and delete IFC Factor in G65.
3.) If FD Fernald Support dollars appear below, and were generated as a percenatage of the DFC, Risk Budget would apply and these dollars would be de-escalated to FY96. Indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the NO box.
If the FDF Support costs are supported by LOE estimates, use those estimates for input to microframe, enter 'SPACE BAR' in the Yes Box and an X in the N

DOES RISK BUDGET APPLY TO FD FERNALD SUPPORT COSTS	YES	NO X

FD FERNALD SUPPORT COSTS	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
FD FERNALD PROJECT MGMT.						$100,902
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM						$100,900
FD FERNALD CONSTRUCTION MGMT.						$1,7[illegible]
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	[illegible]
TOTAL CM						$1,7[illegible]
FD FERNALD WASTE PROGRAM MGMT.						$5,003,680
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM						$5,003,680
FD FERNALD RSO						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO						
FD FERNALD ENGINEERING/DESIGN/INSPECTION						$124,815
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.						$124,820
A/E ENGINEERING/DESIGN/INSPECTION						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E						
SUB-TOTAL PROJECT TARGET EST. (FY99 DOLLARS)						$11,896,938

If FDF Support Costs were based on % defaults, indicate 'Yes' above. These costs are considered FY99 $'s and Risk Budget applies.

If FDF Support Costs were based on LOE estimates provided by the CAM's, indicate 'NO' and escalate the LOE dollars to FY99. ($\bar{x}$ 1.079)
Risk Budget will NOT apply. Separate the Sales Tax below.

The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

OTHER FD FERNALD SALES TAX - 6%						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER FD FERNALD SALES TAX						

TOTAL PROJECT TARGET EST. (FY99 DOLLARS)	$11,896,938

ESTIMATE SUMMARY SHEET

PROJECT: Vit 2 D&D Joule Heated Vitrification

DATE: 17-Aug-99

ESTIMATE NO.: C4981202R2

Direct Field Cost w/FACTORS AND RISK BUDGET

8113

ESTIMATOR: Wagner

CLIENT: DOE

YES X | NO

LOCATION: FERNALD

WBS NO.: 2.1.3.G.P

TASK NO.: 4S11B

PAY ITEM NO.	DESCRIPTION	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
						161800	
	Mobilization Cost	17400		13800	800	161800	193800
		$57,690		$121,840	$140,310	$227,400	$547,240
	Below Grade	163880					163880
		$543,330					$543,330
	Above Grade	787890					
		$2,612,170					$2,612,170
	Demobilization Cost	36400	8200	2500	4900		
		$120,680	$182,710	$22,070	$859,370		$1,184,830
	TOTAL DIRECT FIELD COSTS w/FACTORS	(FY99 DOLLARS)					$4,887,570

NOTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

CONTAINER PURCHASE & PREPARATION

Labor — 4 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	0.25	$9.17
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28
WASTE - Planner	$37.12	1.00	$37.12
IH - Industrial Hygiene	$25.93	0.00	$0.00
MVOH - HEO	$25.71	4.00	$102.85
MVOH - HAZWAT	$25.71	4.00	$102.85
QA - Performance/QA	$37.30	0.50	$18.65
Total Labor/Container	$27.99	10.00	$279.92

Material

Description	Rate	Qty	Total
Misc - Caulk, banding	$12.79	5	$63.93
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00
Reconditioned L-WMB Container	$4,779.37	1	$4,779.37
Total Material/Container			$4,843.30

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.25	$9.71
Tractor	$38.84	0.25	$9.71
Forktruck	$10.79	0.25	$2.70
Flatbed trailer	$16.19	0.25	$4.05
Total Equipment/Container			$26.17
Total Container Purchase & Preparation			$5,149.38

CONTAINER PACKAGING

Labor — 2 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	1.00	$36.69
WASTE - Waste Tech	$37.12	4.00	$148.47
CLRK - MC&A Clerk	$19.62	0.25	$4.90
RAD - Rad Tech	$28.56	4.00	$114.24
MVOH - HEO	$25.71	8.00	$205.70
MVOH - HAZWAT	$25.71	8.00	$205.70
QA - Performance/QA	$37.30	1.00	$37.30
Total Labor/Container	$28.69	26.25	$753.01

PPE Material $'s

Description	Rate	Qty/day/wkr	Total
Protec Coveralls	$5.72	4	$22.87
Protec shoe covers	$0.42	4	$1.68
Powdered latex gloves	$0.07	4	$0.28
Cotton glove liners	$0.41	4	$1.64
Leather Gloves	$3.05	4	$12.21
Respirator Catridges	$4.75	4	$18.99
Total PPE Material/wkr/day			$57.68
Total PPE Material/container	6	wkrs	$173.05

Equipment

Description	Rate/Day	Days	Total
Trackhoe w/grappler	$38.84	0.5	$19.42
Forktruck	$10.79	0.5	$5.40
Total Equipment/Container			$24.82
Total Packaging			$950.87

CONTAINER STAGING

Labor

Description	Rate	Hours	Total
CLRK - Data Entry Clerk	$19.62	0.25	$4.90
CLRK - MC&A Clerk	$19.62	2.00	$39.23
QA - Performance/QA	$37.30	1.00	$37.30
MAINT - Shipping Supv	$36.69	0.50	$18.34
WASTE - Waste Tech	$37.12	4.00	$148.47
RAD - Rad Tech	$28.56	2.00	$57.12
WASTE - Shipping Coord	$37.12	1.00	$37.12
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	4.00	$102.85
Total Labor per Truckload	$29.99	15.25	$457.41
Total Labor per Container	1	/truck	$457.41

Material

Description	Rate	Qty	Total
Barcode labels	$0.30	2	$0.60
Container seals	$0.28	1	$0.28
Laminate for labels	$0.46	2	$0.93
Total Material/Container			$1.81

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Staging			$474.76

CONTAINER SHIPPING PREPARATION

Labor

Description	Rate	Hours	Total
MAINT - Traffic Coord	$36.69	2.00	$73.37
CLRK - MC&A Clerk	$19.62	3.00	$58.85
QA - Performance/QA	$37.30	4.00	$149.20
RAD - Rad Tech	$28.56	3.17	$90.54
WASTE - Shipping Coord	$37.12	0.10	$3.71
MAINT - Transportation	$36.69	1.50	$55.03
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	0.75	$19.28
MVOH - MVO	$25.71	1.50	$38.57
CRFT - Carpenter	$27.32	0.50	$13.66
UTIL - Laborer	$24.14	1.00	$24.14
MVOH - HEO	$25.71	1.00	$25.71
UTIL - Mechanic	$24.14	0.33	$7.97
Total Labor/Truckload	$29.57	19.35	$572.10
Total Labor per Container	1	/truck	$572.10

Material

Description	Rate	Qty	Total
Placards	$0.38	4	$1.51
Trailer seals	$0.28	1	$0.28
Wood bracing 2x4 - LF	$0.65	40	$25.90
Paint	$17.26	0.1	$1.73
Banding	$0.05	20	$1.08
Total Material/Container			$30.49

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Shipping Preparation			$618.13

CONTAINER SHIPPING - FREIGHT

Flatbed to Nevada Test Site			$3,452.80
Total Freight per Container	1	/truck	$3,452.80

Total Waste Mgmt. Cost/TOP LOADING ISO	$10,645.94

Container Burial - NTS	Rate	Vol cu ft	Total
Top Loading L-WMB Container	$7.50	1,280	$9,600.00

****All costs are in stated in FY99 Dollars.****

Multiply these dollars by 0.9268 to = FY96 $'s for input to MF.
Performed by Estimating Services

Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

LOE SUMMARY INPUT - DEESCALATED TO FY96 DOLLARS

Labor Description	FY99 Rate	Hours	FY99 Total	0.9268 FY96 $'s	NO. of CONTAINERS	470	TOTAL FY96 $'s
MAINT - Ops Supv	$36.69	1.25	$45.86	$42.50			
MAINT - Shipping Supv	$36.69	0.50	$18.34	$17.00			
MAINT - Traffic Coord	$36.69	2.00	$73.37	$68.00			
MAINT - Transportation	$36.69	1.50	$55.03	$51.00			
MAINT		5.25	$192.60	$178.50	470		$83,896.44
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28	$8.60			
WASTE - Planner	$37.12	1.00	$37.12	$34.40			
WASTE - Waste Tech	$37.12	8.00	$296.94	$275.20			
WASTE - Shipping Coord	$37.12	1.10	$40.83	$37.84			
WASTE		10.35	$384.17	$356.05	470		$167,341.68
IH - Industrial Hygiene	$25.93	0.00	$0.00	$0.00			
Industrial Hygiene		0.00	$0.00	$0.00			
QA - Performance/QA	$37.30	6.50	$242.46	$224.71			
QA		6.50	$242.46	$224.71	470		$105,613.17
RAD - Rad Tech	$28.56	9.17	$261.91	$242.73			
RAD		9.17	$261.91	$242.73	470		$114,085.02
CRFT - Carpenter	$27.32	0.50	$13.66	$12.66			
CRFT		0.50	$13.66	$12.66	470		$5,950.30
MVOH - HEO	$25.71	13.00	$334.26	$309.80			
MVOH - HAZWAT	$25.71	16.75	$430.69	$399.16			
MVOH - MVO	$25.71	1.50	$38.57	$35.75			
MVOH		31.25	$803.52	$744.70	470		$350,009.15
UTIL - Warehouse Attendant	$24.14	1.00	$24.14	$22.37			
UTIL - Laborer	$24.14	1.00	$24.14	$22.37			
UTIL - Mechanic	$24.14	0.33	$7.97	$7.38			
UTIL		2.33	$56.24	$52.12	470		$24,497.81
CLRK - MC&A Clerk	$19.62	5.25	$102.99	$95.45			
CLRK - Data Entry Clerk	$19.62	0.25	$4.90	$4.55			
CLRK		5.50	107.89	$99.99	470		$46,996.11
TOTAL LABOR HOURS & DOLLARS		70.85	$2,062.44	$1,911.47	470		$898,389.67
Misc. Material							
Description	Rate	Qty	Total				
			$0.00	$0.00			
Misc - Caulk, banding	$12.79	5	$63.93	$59.25			
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00	$0.00			
Barcode Labels	$0.30	2	$0.60	$0.56			
Container Seals	$0.28	1	$0.28	$0.26			
Laminate for Labels	$0.46	2	$0.93	$0.86			
Placards	$0.38	4	$1.51	$1.40			
Trailer Seals	$0.28	1	$0.28	$0.26			
Wood bracing 2x4 - LF	$0.65	40	$25.90	$24.00			
Paint	$17.26	0.1	$1.73	$1.60			
Banding	$0.05	20.0	$1.08	$1.00			
TOTAL MISC. MATERIAL DOLLARS		85.10	$96.23	$89.19	470		$41,918.37
Container Purchase - Material							
Reconditioned L-WMB Container	$4,779.37	1.00	$4,779.37	$4,429.52			
TOTAL CONTAINER PURCHASE DOLLARS		1.00	$4,779.37	$4,429.52	470		$2,081,872.61
Equipment							
Description	Rate/Day	Days	Total				
Taylor - forktruck	$38.84	0.65	$25.25	$23.40			
Tractor	$38.84	0.65	$25.25	$23.40			
Forktruck	$10.79	0.75	$8.09	$7.50			
Flatbed Trailer	$16.19	0.25	$4.05	$3.75			
Trackhoe w/grappler	$38.84	0.50	$19.42	$18.00			
TOTAL EQUIPMENT DOLLARS		2.80	$82.06	$76.05	470		$35,744.11
PPE MATERIAL COST							
Description	WKR/DAY	$/DAY	Total				
Total PPE Material/container	6	57.68	$173.05	$160.38			
				$160.38	470		$75,379.90
CONTAINER SHIPPING - FREIGHT							
Flatbed to Nevada Test Site			$3,452.80	$3,200.06	470		$1,504,025.87
TOTAL FDF WASTE MGMT. COSTS		FY99	$10,645.94	FY96 $'s	470		$4,637,330.53
TOTAL DOE NTS BURIAL FEE COSTS		1280.00	601600	cu.ft.	470	$6.95	$4,181,721.60

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

ASSUMPTIONS

CONTAINER PREPARATION:

a. Four containers can be prepared per day.
b. Containers are reconditioned and the prices reflect the current acquisition contract costs.

CONTAINER PACKAGING:

a. Two containers can be packaged per day.
b. PPE quantities are for six workers.
c. PPE pricing is based on unit costs from the Lab Safety catalog and escalated to FY98 dollars.

CONTAINER STAGING:

a. The labor to stage containers to load on a flatbed truck. Divide by containers / truck load. For this study, assume 1 container per truck load.
b. The material and equipment costs are for one container.

CONTAINER SHIPPING PREPARATION:

a. The labor to prepare and load a flatbed truck. Divide by containers per truck load. For this study assume 1 container per truck load. (42,000# gross weight)
b. The material and equipment costs are for one container.

CONTAINER SHIPPING FREIGHT:

a. Shipping charges are based on an avg. of three carrier contract rates currently being used at the site.
b. NTS burial costs are the anticipated FY98 rates that include shipping scrap copper volumes. If this does not happen, rates could be as high as $12.50 per cubic foot.

LABOR:

a. These costs are for direct field/operations costs. Project management costs are excluded.
b. Labor dollars are based on the FY99 Replan rates and are considered FY98 dollars.

EQUIPMENT:

a. Equipment dollars are for maintenance costs only. Any purchase cost and fuel usage have been excluded.

D & D Vit Joule Heated

Unbulked Material Estimates (ft3)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Vit 2 Joule Heated	65,474		67,473				6,184	219		139,350
Total	65,474		67,473				6,184	219		139,350

D & D Vit Joule Heated

Bulked Material Estimates (ft3)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Vit 2 Joule Heated	222,612		87,714				12,368	438		323,132
Total	222,612		87,714				12,368	438		323,132
Container	ROB		ROB				ROB	ROB		
Quantity	279		220				16	1		
Disposition	OSDF		OSDF				OSDF	OSDF		

Note - OSDF prohibited material equates to 12,354 cubic feet which can be dispositioned to NTS utilizing 155 White Metal Boxes or 13 End Loading ISO containers.

323,132 / 1,025 = 315 + 155 = 470 ALL BOXES TO NTS

D & D Vit Joule Heated

Material Weight Estimates (Tons)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Vit 2 Joule Heated	818		3374				46	2		4240
Total	818		3374				46	2		4240

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DEBRIS BULKING FACTORS

* A - Accessible Metals (OSDF 2)
  Bulking Factor 3

* B - Inaccessible Metals (OSDF 2)
  Bulking Factor 3

* C - Process-Related Metals
  Bulking Factor 3

* D - Light-Gauge Metals (OSDF 2)
  Bulking Factor 2

* E - Concrete (OSDF 2)
  Bulking Factor 1.3

* G - Non-Regulated ACM (OSDF 2/3)
  Bulking Factor 1.2

* H - Regulated ACM (OSDF 5)
  Bulking Factor 3

* I - Miscellaneous Debris (OSDF 2/4)
  Bulking Factor 3.5

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost				820						17,400		13,800	800	$32,000
	Below Grade VIT Bldg				3,878						78,530				$78,530
	Below Grade Analytical Lab				54						1,090				$1,090
	Below Grade Mech/Elect				550						11,140				$11,140
	Below Grade Warehouse				724						14,660				$14,660
	Below Grade Additive Storage				197						3,990				$3,990
	Below Grade On-Site Storage				2,296						46,490				$46,490
	Below Grade Site Work & Interconnecting Bldg.				394						7,980				$7,980
	Above Grade VIT Bldg				13,439						272,150				$272,150
	Above Grade Analytical Lab				594						12,020				$12,020
	Above Grade Mech/Elect				1,704						34,510				$34,510
	Above Grade Warehouse				506						10,230				$10,230
	Above Grade Control Room				80						1,610				$1,610
	Above Grade Additive Storage				1,662						33,670				$33,670
	Above Grade On-Site Storage				3,019						61,120				$61,120
	Above Grade Site Work & Interconnecting Bldg.				1,817						36,780				$36,780
	Equipment				12,537						253,800				$253,800
	Piping Systems				473						9,600				$9,600
	Instrumentation				701						14,200				$14,200
	Electrical				2,381						48,200				$48,200
	Demobilization Cost				1,780						36,400	8,200	2,500	4,900	$52,000
	Total Direct Cost				49,606						$1,005,570	$8,200	$16,300	$5,700	$1,035,770

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Temporary Utilities	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		1000	20.27			1500	3.50	$20,270		$1,500	$3,500	$25,270
D	Remove Temporary Utilitries	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000			$3,240	$8,220			$11,460
	Total				1,780						$36,400	$8,200	$2,500	$4,900	$52,000

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	VIT Bldg.														
	Concrete Below grade														
mC	SOG	925	cy	1.08	1913	20.25					$38,740				$38,740
mC	Structural footings	395	cy	1.08	817	20.25					$16,540				$16,540
mC	Wall footings	370	cy	1.08	765	20.25					$15,490				$15,490
mC	Equipment foundations	185	cy	1.08	383	20.25					$7,760				$7,760
	VIT Bldg.														
	Concrete Above grade														
mC	Grout	300	cf	0.04	23	20.25					$470				$470
mC	Walls	730	cy	1.08	1510	20.25					$30,580				$30,580
mC	Elevated floor	255	cy	1.08	527	20.25					$10,670				$10,670
mC	Tilt up walls 17,000 sf x 1' thick	17000	cf	0.04	1302	20.25					$26,370				$26,370
mC	Columns for mod. walls	170	cy	1.08	352	20.25					$7,130				$7,130
	VIT Bldg.														
	Structural Steel														
mC	Metal roofing 20guage 1.5#/sf	22700	sf	0.008	348	20.25					$7,050				$7,050
mC	Light steel	60	ton	5.00	575	20.25					$11,640				$11,640
mC	Medium steel	71	ton	5.00	680	20.25					$13,770				$13,770
mC	Heavy steel	80	ton	5.00	766	20.25					$15,510				$15,510
mC	Crane rails	3.3	ton	5.00	32	20.25					$650				$650
mC	Checkered plate 3045sf 5/16" 12.75#/sf	19.4	ton	5.00	186	20.25					$3,770				$3,770
mC	Ladders 6#/lf 257 lf	0.77	ton	5.00	7	20.25					$140				$140
mC	Stairs 50#/riser 44 risers	1.1	ton	5.00	11	20.25					$220				$220
mC	Handrail 2runs 2" cs pipe=7.3#/lf 12 lf	0.10	ton	5.00	1	20.25					$20				$20
mC	Davits 1 ea	0.25	ton	5.00	2	20.25					$40				$40
mC	Crane rail box beam	2.2	ton	5.00	21	20.25					$430				$430
mC	Pre-engineered struct 4025sf * 9#	18	ton	5.00	173	20.25					$3,500				$3,500
	VIT Bldg.														
	Architectural/Buildings/Finishes														
mC	Metal stud w/ gyp. board 3/8"	8840	sf	0.05	779	20.25					$15,770				$15,770
mC	Siding 1/8" metal	57400	sf	0.02	2199	20.25					$44,530				$44,530
mC	Membrane roofing 1/16" sealant	22700	sf	0.02	870	20.25					$17,620				$17,620
mC	Roof insulation 1/2"	22700	sf	0.02	783	20.25					$15,860				$15,860
mC	Fiberboard 1/2"	22700	sf	0.02	783	20.25					$15,860				$15,860
mC	Batten insulation 1/2"	28700	sf	0.02	989	20.25					$20,030				$20,030
mC	Double ext. doors metal	4	ea	0.67	5	20.25					$100				$100
mC	Single ext. drs. mtl.	1	ea	0.50	1	20.25					$20				$20
mC	Roll-up dr. 14'x14' mtl.	2	ea	3.20	12	20.25					$240				$240
mC	Double interior dr mtl.	5	ea	0.67	6	20.25					$120				$120
mC	Single interior dr. mtl	7	ea	0.50	7	20.25					$140				$140

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
mC	HVAC Duct galv. steel. medium	32	ton	5.00	306	20.25					$6,200				$6,200
mC	HVAC dampers	1	ton	5.00	10	20.25					$200				$200
mC	HVAC accessories	1	ton	5.00	10	20.25					$200				$200
mC	HVAC supports	1	ton	5.00	10	20.25					$200				$200
mC	Building sprinklers	2000	lf	0.040	153	20.25					$3,100				$3,100
	Analytical Lab														
	Concrete Below grade														
mC	SOG 26cy * 27	702	cf	0.040	54	20.25					$1,090				$1,090
	Analytical Lab														
	Concrete Above grade														
mC	Walls 28cy *27	756	cf	0.040	58	20.25					$1,170				$1,170
mC	Elevated slab 18cy *27	486	cf	0.040	37	20.25					$750				$750
	Analytical Lab														
	Structural steel														
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf 62 lf	0.11	ton	5.00	1	20.25					$20				$20
	Analytical Lab														
	Architectural/Buildings/Finishes														
mC	Metal stud w/gyp brd 3/8"	4380	sf	0.05	386	20.25					$7,820				$7,820
mC	Skirt trailers 1/8" metal	684	sf	0.02	24	20.25					$490				$490
mC	Stairs and ramps metal	2	ton	5.00	19	20.25					$380				$380
mC	Single ext. dr. mtl.	4	ea	0.40	3	20.25					$60				$60
mC	Single int. dr. mtl.	19	ea	0.40	15	20.25					$300				$300
mC	Building sprinklers	500	lf	0.04	38	20.25					$770				$770
mC	HVAC Duct	1.4	ton	5.00	13	20.25					$260				$260
	Mech/Elect														
	Concrete below grade														
mC	SOG 175cy * 27	4725	cf	0.04	362	20.25					$7,330				$7,330
mC	Structural footings 60cy * 27	1620	cf	0.04	124	20.25					$2,510				$2,510
mC	Equipment foundations30cy * 27	810	cf	0.04	62	20.25					$1,260				$1,260
mC	Grout	30	cf	0.04	2	20.25					$40				$40
	Mech/Elect														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	5610	sf	0.01	86	20.25					$1,740				$1,740
mC	Light steel	8	ton	5.00	77	20.25					$1,560				$1,560
mC	Medium steel	11	ton	5.00	105	20.25					$2,130				$2,130
mC	Heavy steel	13	ton	5.00	124	20.25					$2,510				$2,510
mC	Ladders 28 lf 6#/lf	0.1	ton	5.00	1	20.25					$20				$20

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mech/Elect														
	Architectural														
mC	Siding 1/8"mtl.	11620	sf	0.02	445	20.25					$9,010				$9,010
mC	Roof insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Wall insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Membrane roofing 1/16" sealant	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Fiber board 1/2"	5610	sf	0.018	193	20.25					$3,910				$3,910
mC	Single ext. dr. mtl.	2	ea	0.400	2	20.25					$40				$40
mC	Double ext. dr. mtl.	3	ea	0.67	4	20.25					$80				$80
mC	Roll-up door 14'x14' mtl.	1	ea	3.20	6	20.25					$120				$120
mC	Double int. dr. mtl.	2	ea	0.67	3	20.25					$60				$60
mC	HVAC Duct galv. steel. medium	2.8	ton	5.00	27	20.25					$550				$550
mC	HVAC dampers	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC accessories	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC supports	0.25	ton	5.00	2	20.25					$40				$40
mC	Building sprinklers	600	lf	0.040	46	20.25					$930				$930
	Warehouse														
	Concrete Below grade														
mC	SOG 330cy * 27	8910	cf	0.04	683	20.25					$13,830				$13,830
mC	Structural footings 20cy * 27	540	cf	0.04	41	20.25					$830				$830
	Warehouse														
	Structural steel														
mC	Pre-engineered struct. 9600sf 9#/sf	43	ton	5.00	414	20.25					$8,380				$8,380
	Warehouse														
	Architectural														
mC	Metal stud w/ gyp bd.	100	sf	0.05	10	20.25					$200				$200
mC	Single ext. dr. mtl.	6	ea	0.40	5	20.25					$100				$100
mC	Double exterior door metal	1	ea	0.67	1	20.25					$20				$20
mC	Roll-up door metal 14'x14'	3	ea	3.20	18	20.25					$360				$360
mC	Single interior door metal	1	ea	0.40	1	20.25					$20				$20
mC	Building sprinklers	750	lf	0.040	57	20.25					$1,150				$1,150
	Control Room														
	Architectural														
mC	Metal stud w/ gyp bd.	560	sf	0.05	54	20.25					$1,090				$1,090
mC	Skirting 1/8" metal	348	sf	0.02	13	20.25					$260				$260
mC	Metal ramp & stairs	0.5	ton	5.00	5	20.25					$100				$100
mC	Single interior door metal	4	ea	0.40	3	20.25					$60				$60
mC	HVAC duct, supports, dampers & acces.	0.50	ton	5.00	5	20.25					$100				$100

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Additive Storage														
	Concrete Below grade														
mC	SOG	60	cy	1.08	124	20.25					$2,510				$2,510
mC	Structural footings	25	cy	1.08	52	20.25					$1,050				$1,050
mC	Equipment foundation	10	cy	1.08	21	20.25					$430				$430
	Additive Storage														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	1100	sf	0.01	17	20.25					$340				$340
mC	Light steel	8	ton	5.00	77	20.25					$1,560				$1,560
mC	Medium steel	11	ton	5.00	105	20.25					$2,130				$2,130
mC	Heavy steel	12	ton	5.00	115	20.25					$2,330				$2,330
mC	Checkered plate 1,000 sf 5/16" 12.75#/sf	6	ton	5.00	61	20.25					$1,240				$1,240
mC	Stairs 50#/riser 110 risers	3	ton	5.00	26	20.25					$530				$530
mC	Bin loading lines =<2 1/2"	275	lf	0.05	28	20.25					$570				$570
	Additive Storage														
	Architectural														
mC	Siding 1/8"mtl.	20110	sf	0.02	770	20.25					$15,590				$15,590
mC	Roof insulation 1/2"	1100	sf	0.02	38	20.25					$770				$770
mC	Wall insulation 1/2"	10055	sf	0.02	347	20.25					$7,030				$7,030
mC	Membrane roofing 1/16" sealant	1100	sf	0.02	38	20.25					$770				$770
mC	Fiber board 1/2"	1100	sf	0.018	38	20.25					$770				$770
mC	Single ext. dr. mtl.	1	ea	0.400	1	20.25					$20				$20
mC	Double ext. dr. mtl.	1	ea	0.67	1	20.25					$20				$20
	On-Site Storage														
	Concrete Below grade														
mC	SOG	780	cy	1.08	1613	20.25					$32,660				$32,660
mC	Structural footing	155	cy	1.08	321	20.25					$6,500				$6,500
mC	Continuos footing	175	cy	1.08	362	20.25					$7,330				$7,330
	On-Site Storage														
	Concrete Above grade														
mC	Tilt-up walls 16,360 sf * 1ft thick	16360	cf	0.04	1253	20.25					$25,370				$25,370
mC	Columns for mod. wall	250	cy	1.08	517	20.25					$10,470				$10,470
	On-Site Storage														
	Structural steel														
mC	Light steel	96	ton	5.00	919	20.25					$18,610				$18,610
mC	Medium steel	1	ton	5.00	10	20.25					$200				$200
mC	Heavy steel	4	ton	5.00	38	20.25					$770				$770
mC	Crane rail box beam stl.	9.6	ton	5.00	92	20.25					$1,860				$1,860
mC	Supports for box beam	1	ton	5.00	10	20.25					$200				$200
mC	Crane rail stops	1	ton	5.00	10	20.25					$200				$200

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	On-Site Storage														
	Architectural														
mC	Single ext. dr. mtl.	6	ea	0.40	5	20.25					$100				$100
mC	Roll-up door metal 14'x14'	2	ea	3.20	12	20.25					$240				$240
mC	Building sprinklers	2000	lf	0.040	153	20.25					$3,100				$3,100
	Site Work														
	Pipe rack / Below grade concrete														
mC	Structural footings 26cy *27	702	cf	0.040	54	20.25					$1,090				$1,090
	Site Work														
	Pipe rack / Structural steel														
mC	Light steel	3	ton	5.00	29	20.25					$590				$590
mC	Medium steel	4	ton	5.00	38	20.25					$770				$770
mC	Heavy steel	5	ton	5.00	48	20.25					$970				$970
	Site Work														
	Cooling tower / Below grade concrete														
mC	Concrete 10cy *27	270	cf	0.04	21	20.25					$430				$430
	Site Work														
	Contam'd water/Below grade concrete														
mC	SOG 40cy *27	1080	cf	0.04	83	20.25					$1,680				$1,680
	Site Work														
	Contam'd water/Above grade concrete														
mC	Walls 105 cy * 27	2835	cf	0.04	217	20.25					$4,390				$4,390
mC	Concrete blocks	270	cf	0.04	21	20.25					$430				$430
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf	0.2	ton	5.00	2	20.25					$40				$40
mC	Double contained pipe HDPE	2100	lf	0.20	804	20.25					$16,280				$16,280
	Site Work														
	Storm water														
mC	Catch Basins	108	cf	0.04	8	20.25					$160				$160
	Site Work														
	Off-Gas & HVAC Stack Below grade														
mC	Structural footings	6	cy	1.08	12	20.25					$240				$240
mC	Stack Base	4	cy	1.08	8	20.25					$160				$160
mC	Duct footings	6	cy	1.08	12	20.25					$240				$240
mC	Guy anchors	8	cy	1.08	17	20.25					$340				$340

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Site Work														
	Off-Gas & HVAC Stack Above grade														
mC	Stack structure	4	ton	5	38	20.25					$770				$770
mC	Ladder 110lf 6#/lf	0.33	ton	5	3	20.25					$60				$60
mC	Grating 86sf 10#/sf	0.45	ton	5	4	20.25					$80				$80
mC	Platform steel	0.44	ton	5	4	20.25					$80				$80
mC	Davit 2ea	0.5	ton	5	5	20.25					$100				$100
mC	Kickplate 48lf	48	lf	0.016	1	20.25					$20				$20
mC	Duct to Stack 200lf	200	lf	0.143	55	20.25					$1,110				$1,110
mC	Duct support 4 ea	0.5	ton	5	5	20.25					$100				$100
mC	Handrail 48lf 2runs 2"cs pipe 7.3#/lf	0.2	ton	5	2	20.25					$40				$40
	Site Work														
	Poten. Contam. Water														
C	Drain lines	1500	lf	0.16	481	20.25					$9,740				$9,740
	Site Work														
	A/C Condensing Pads/Below grade														
mC	SOG	10	cy	1.08	21	20.25					$430				$430
	Interconnecting Bldg.														
	Concrete Below grade														
mC	SOG	60	cy	1.08	124	20.25					$2,510				$2,510
mC	Structural footing	10	cy	1.08	21	20.25					$430				$430
mC	Equipment foundations	10	cy	1.08	21	20.25					$430				$430
	Interconnecting Bldg.														
	Structural steel														
mC	Pre-engineered struct. 1200sf 9#/sf	5	ton	5.00	52	20.25					$1,050				$1,050

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	15-ag-001 Setting tank rake 1hp	0.25	tn	20	10	20.25					$200				$200
C	15-ag-002 Slurry surge agitator	2.5	tn	20	100	20.25					$2,030				$2,030
C	15-ag-003,004 Feed prep agitator	4.5	tn	20	180	20.25					$3,650				$3,650
C	15-ag-005 Overflow agitator	0.2	tn	20	8	20.25					$160				$160
C	15-ag-006 Slurry receipt agitator	2.75	tn	20	110	20.25					$2,230				$2,230
C	15-fl-001 Milled slot screen	0.25	tn	20	10	20.25					$200				$200
C	15-pm-001a&b Underflow pump	0.5	tn	20	20	20.25					$410				$410
C	15-pm-002a&b Slurry surge pump	1	tn	20	40	20.25					$810				$810
C	15-pm-003a&b Feed prep pump	1	tn	20	40	20.25					$810				$810
C	15-pm-004a&b Feed prep pump	1	tn	20	40	20.25					$810				$810
C	15-pm-005 Overflow tnk pump A & B	0.5	tn	20	20	20.25					$410				$410
C	15-pm-006a&b Slurry recpt tnk pump	0.5	tn	20	20	20.25					$410				$410
C	15-pm-007 Flush wtr. pump A & B	2	tn	20	80	20.25					$1,620				$1,620
C	15-tk-001 Settling tank	2	tn	20	80	20.25					$1,620				$1,620
C	15-tk-002 Slurry surge tank	6	tn	20	241	20.25					$4,880				$4,880
C	15-tk-003&4 Feed prep tank	8	tn	20	321	20.25					$6,500				$6,500
C	15-tk-005 Overflow sump tank	1	tn	20	40	20.25					$810				$810
C	15-tk-006 Slurry recpt tank	8	tn	20	321	20.25					$6,500				$6,500
C	16-ag-001a&b Melter feed agitator	2	tn	20	80	20.25					$1,620				$1,620
C	16-pm-001a&b Melter recirl pump A & B	0.75	tn	20	30	20.25					$610				$610
C	16-pm-002a&b Melter feed pump A&B	0.5	tn	20	20	20.25					$410				$410
C	16-pm-003a&b Melter feed pump A&B	0.5	tn	20	20	20.25					$410				$410
C	16-tk-001a&b Melter feed tank A & B	2	tn	20	80	20.25					$1,620				$1,620
C	17-fa-001 Burner fan	0.25	tn	20	10	20.25					$200				$200
	17-pe-001 Joule heated melter	10	tn	20	401	20.25					$8,120				$8,120
C	18-ag-001 Precipitator tk. agitator	0.2	tn	20	8	20.25					$160				$160
C	18-ag-002 Purge tank agitator	0.2	tn	20	8	20.25					$160				$160
C	18-ag-003 Caustic tank agitator	0.8	tn	20	32	20.25					$650				$650
C	18-fa-001 EOG fan	0.4	tn	20	16	20.25					$320				$320
C	18-fl-001 EOG knockout tank filter	0.2	tn	20	8	20.25					$160				$160
C	18-fl-002 EOG hepa filter	0.2	tn	20	8	20.25					$160				$160
C	18-he-001 Quench heat exchanger	1	tn	20	40	20.25					$810				$810
C	18-he-002 Scrubber heat exchanger	1	tn	20	40	20.25					$810				$810
C	18-pe-001 Elect. precipitator	0.5	tn	20	20	20.25					$410				$410
C	18-pe-002 Quench tower	0.5	tn	20	20	20.25					$410				$410
C	18-pe-003 Scrubber	0.5	tn	20	20	20.25					$410				$410
	Take-off Allowance														
	Subtotal Direct Costs	1	LOT		2,542	20.26					51,500				$51,500

8113

000158

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	18-pm-001 Precipitator caustic pumpA & B	0.5	tn	20	20	20.25					$410				$410
C	18-pm-002 Quench tower pump A & B	0.5	tn	20	20	20.25					$410				$410
C	18-pm-003 Scrubber pump A & B	0.5	tn	20	20	20.25					$410				$410
C	18-pm-004 Scrubber caustic pump A & B	0.4	tn	20	16	20.25					$320				$320
C	18-pm-005 WESP pump	0.1	tn	20	4	20.25					$80				$80
C	18-pm-006 Scrubber purge pump A & B	0.4	tn	20	16	20.25					$320				$320
C	18-tk-001 Precipitator tank	0.5	tn	20	20	20.25					$410				$410
C	18-tk-002 Purge tank	0.25	tn	20	10	20.25					$200				$200
C	18-tk-003 Caustic tank	1.5	tn	20	60	20.25					$1,220				$1,220
	18-tk-005 EOG knockout tank	0.2	tn	20	8	20.25					$160				$160
C	20-fa-002 Off-Gas fan D & E	0.2	tn	20	8	20.25					$160				$160
C	20-fl-001 Off-Gas HEPA filter D & E	0.1	tn	20	4	20.25					$80				$80
C	20-he-001C RCS condenser	0.3	tn	20	12	20.25					$240				$240
C	20-he-002C RCS cooler	0.2	tn	20	8	20.25					$160				$160
C	20-pm-001 Condensate pump C & D	0.2	tn	20	8	20.25					$160				$160
C	20-pm-002 Chilled water supply pump C&D	0.2	tn	20	8	20.25					$160				$160
C	20-m-001 Carbon bed J, K, M, & N	80	tn	20	3208	20.25					$64,960				$64,960
C	20-m-002 Air dryer package C	1	tn	20	40	20.25					$810				$810
C	20-m-003 NOx removal system	1	tn	20	40	20.25					$810				$810
C	20-ru-001 D, E Chiller package	1	tn	20	40	20.25					$810				$810
C	20-tk-001 C Condensate tank	0.2	tn	20	8	20.25					$160				$160
C	20-tk-003 Chilled water tank	0.4	tn	20	16	20.25					$320				$320
C	23-cr-001 Monolith CCTV contrl. station	0.1	tn	20	4	20.25					$80				$80
C	23-cy-001 MTC Conveyor	2.5	tn	20	100	20.25					$2,030				$2,030
C	23-me-002 Storage rack	6	tn	20	241	20.25					$4,880				$4,880
C	23-me-001 MCT lift	4	tn	20	160	20.25					$3,240				$3,240
C	23-tv-001 Monolith CCTV	0.2	tn	20	8	20.25					$160				$160
C	24-cn-001 MCR bridge crane	4	tn	20	160	20.25					$3,240				$3,240
C	24-cy-001 Shipping conveyor	20	tn	20	802	20.25					$16,240				$16,240
C	24-cn-002 MTC lift station	2	tn	20	80	20.25					$1,620				$1,620
C	24-me-002 Capping station	3	tn	20	120	20.25					$2,430				$2,430
C	25-hd-001 Container forklift A & B	2	tn	20	80	20.25					$1,620				$1,620
	Take-off Allowance														
	Total Direct Cost	1	LOT		5,349	20.25					108,300				108,300

000159

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	30-ts-001 Electrical transfer switch	0.4	tn	20	16	20.25					$320				$320
C	26-bn-001 Vacuum bin	0.25	tn	20	10	20.25					$200				$200
C	26-bn-002 Frit bin	0.25	tn	20	10	20.25					$200				$200
C	26-me-001 Remote glass breaker	1.5	tn	20	60	20.25					$1,220				$1,220
C	26-pe-001 Rework hammer mill	0.25	tn	20	10	20.25					$200				$200
C	26-cn-001 Rework bridge crane	15	tn	20	601	20.25					$12,170				$12,170
C	26-cy-001 Rework conveyor	7	tn	20	281	20.25					$5,690				$5,690
C	26-cy-002 Scrap metal conveyor	10	tn	20	401	20.25					$8,120				$8,120
C	26-hd-001 Rework metal retriever	1	tn	20	40	20.25					$810				$810
C	26-hd-002 Rework vacuum system	1	tn	20	40	20.25					$810				$810
C	26-hd-003 Monolith rework station	2	tn	20	80	20.25					$1,620				$1,620
C	26-hd-004 Scrap mrtl. box	2	tn	20	80	20.25					$1,620				$1,620
C	26-tv-001..007 Rework CCTV cameras	0.5	tn	20	20	20.25					$410				$410
C	31-mc-001 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-mc-002 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-mc-003 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-mc-004 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-sg-001 Switch gear	0.75	tn	20	30	20.25					$610				$610
C	40-cm-003 Instrument air compressor	0.75	tn	20	30	20.25					$610				$610
C	32-eg-001 Electrical generator	0.5	tn	20	20	20.25					$410				$410
C	40-cm-002 Plant air compressor	0.2	tn	20	8	20.25					$160				$160
C	41-cm-001Breathing air station A & B	4	tn	20	160	20.25					$3,240				$3,240
C	44-bl-001& 2 Addit. trans. blower	0.2	tn	20	8	20.25					$160				$160
C	44-bn-001,2,&3 Addit. bin 1 and 2	3	tn	20	120	20.25					$2,430				$2,430
C	44-fl-001, 002 Filter receiver	2.2	tn	20	88	20.25					$1,780				$1,780
C	44-pm-001 Dense phase pump	0.1	tn	20	4	20.25					$80				$80
C	50-pm-001 Process wtr. pump A & B	0.4	tn	20	16	20.25					$320				$320
C	50-tk-001 Process wtr. tank	0.2	tn	20	8	20.25					$160				$160
C	53-pm-001 Cooling tower pump A & B	0.1	tn	20	4	20.25					$80				$80
C	53-pm-003 Cooling tower	8	tn	20	321	20.25					$6,500				$6,500
C	63-tk-001, 002 Lab waste tank	0.2	tn	20	8	20.25					$160				$160
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		2,506	20.23					50,700				$50,700

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DETAIL ESTIM...TE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	73-ah-001 Oper. area aircondit. unit	0.25	tn	20	10	20.25					$200				$200
C	73-ah-002 HVAC rm. air hdlg. unit	0.2	tn	20	8	20.25					$160				$160
C	73-ah-003 Melter aircond. unit	0.75	tn	20	30	20.25					$610				$610
C	73-fa-001 Corridor fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-002 Melter exh. fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-003 Cooling room fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-004 Loading area fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-005 Rework room fan A & B	0.1	tn	20	4	20.25					$160				$160
C	73-fl-001 Cooling rm. HEPA A,B, & C	0.1	tn	20	4	20.25					$80				$80
C	73-fl-002 Loading area HEPA A,B, & C	0.1	tn	20	4	20.25					$80				$80
C	73-fl-003 Rework rm. HEPA A,B, & C	0.4	tn	20	16	20.25					$320				$320
C	73-me-001..006 Wall louver	1	tn	20	40	20.25					$810				$810
C	73-st-001 Vit. bldg. exh. stack	0.25	tn	20	10	20.25					$200				$200
C	75-ah-001 Lab. office HVAC unit	0.25	tn	20	10	20.25					$200				$200
C	75-ah-002 Lab HVAC unit	0.1	tn	20	4	20.25					$80				$80
C	75-fa-001 Lab. bldg. exh. A & B	0.1	tn	20	4	20.25					$80				$80
C	75-fl-001 Lab. bldg. HEPA unit A & B	1	tn	20	40	20.25					$810				$810
C	76-ah-001 M/E bldg. HVAC unit	1	tn	20	40	20.25					$810				$810
C	76-ah-002 Warehouse air units	0.2	tn	20	8	20.25					$160				$160
C	76-fa-001,002 M/E wall exhausters	0.2	tn	20	8	20.25					$160				$160
C	76-fa-003 Welding hood	0.1	tn	20	4	20.25					$80				$80
C	76-fa-004 M/E wall exh.	0.1	tn	20	4	20.25					$80				$80
C	76-fa-005 M/E wall exh.	0.1	tn	20	4	20.25					$80				$80
C	76-he-001 Elect. rm. heater	0.1	tn	20	4	20.25					$80				$80
C	76-he-002 Warehouse office heater	0.2	tn	20	8	20.25					$160				$160
C	76-he-003 Warehouse unit heater A..F	0.2	tn	20	8	20.25					$160				$160
C	76-me-001 M/E wall louver A & B	20	tn	20	802	20.25					$16,240				$16,240
C	80-cn-001 Melter rm. bridge crane	10	tn	20	401	20.25					$8,120				$8,120
C	80-cn-002 Miscl. monorails	10	tn	20	401	20.25					$8,120				$8,120
C	80-cn-003 Maint. shop crane	1	tn	20	40	20.25					$810				$810
C	82-me-001 Lid install. system	1	tn	20	40	20.25					$810				$810
C	83-sd-001 Shield doors	1	tn	20	40	20.25					$810				$810
C	83-sd-002 Airlock doors														
	Take-off Allowance														
	Total Direct Cost	1	LOT		2,036	20.24					41,200				41,200

CONTRACTOR - Stated in FY99 DOLLARS

000161

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	83-sd-003 Shield door	0.4	tn	20	16	20.25					$320				$320
C	83-sd-004 Shield windows	0.1	tn	20	4	20.25					$80				$80
C	84-me-001 Glass sampling station	0.5	tn	20	20	20.25					$410				$410
C	84-hd-003 Monolith sample insert	0.1	tn	20	4	20.25					$80				$80
C	93-sa-001-005 Emergency eyewash/shower	0.5	tn	20	20	20.25					$410				$410
C	94-se-001 Analy. lab. equip.	1	tn	20	40	20.25					$810				$810
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		104	20.19					2,100				$2,100

000162

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08/20/99

CONTRACTOR

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Piping Systems														
15	PIPNIG SYSTEMS														
C	Remove 1/2" c.s. gate valve	39	EA	Included											
C	Remove 3/4" c.s. gate valve	14	EA	Included											
C	Remove 2" c.s. gate valve	14	EA	Included											
C	Remove 1-1/2" c.s. butterfly valve	1	EA	Included											
C	Remove 1-1/2" c.s. gate valve	1	EA	Included											
16															
C	Remove 1/2" c.s. gate valve	20	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
C	Remove 2" c.s. gate valve	4	EA	Included											
18															
C	Remove 1/2" c.s. gate valve	56	EA	Included											
C	Remove 3/4" c.s. gate valve	22	EA	Included											
C	Remove 2" c.s. gate valve	22	EA	Included											
C	Remove 2" c.s. check valve	1	EA	Included											
C	Remove 4" c.s. check valve	1	EA	Included											
20															
C	Remove 1/2" c.s. gate valve	14	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
C	Remove 2" c.s. gate valve	4	EA	Included											
40															
C	Remove 1/2" c.s. gate valve	2	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
C	Remove 1/2" pipe	750	LF	0.04	60	20.25					$1,220				$1,220
C	Remove 3/4" pipe	750	LF	0.04	60	20.25					$1,220				$1,220
C	Remove 1-1/2" pipe	750	LF	0.04	60	20.25					$1,220				$1,220
C	Remove 2" pipe	500	LF	0.053	53	20.25					$1,070				$1,070
C	Remove 2-1/2" pipe	500	LF	0.053	53	20.25					$1,070				$1,070
C	Remove 4" pipe	500	LF	0.16	160	20.25					$3,240				$3,240
50															
C	Remove 1/2" c.s. gate valve	7	EA	Included											
C	Remove 3/4" c.s. gate valve	2	EA	Included											
C	Remove 2" c.s. gate valve	2	EA	Included											
63															
C	Remove 1/2" c.s. gate valve	2	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
C	Remove 2" c.s. gate valve	4	EA	Included											
C	Piping material bulk	936	CF	0.01	27	20.25					$550				$550
	Pipe:$100K/($140.46*.60)*(308.2cf)=355.7cf/$100K														
	$263,170/$100,00=2.6317*355.7=936cf														
	Take-off Allowance														
	Total Direct Costs		LOTS		473	20.30					$9,600				$9,600

08/20/99

000163

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
15	Instrumentation														
C	Remove pneumatic actuated valves	20	EA	Included											
C	Remove flow/density trans. sensor	4	EA	Included											
C	Remove level switches	18	EA	Included											
C	Remove level transmitter	7	EA	Included											
C	Remove instr. piping for valves	20	EA	Included											
C	Remove instr. piping for transmitter	7	EA	Included											
C	Remove instr. piping for flow trans.	4	EA	Included											
C	Remove pressure switch	2	EA	Included											
C	Remove flow switch	2	EA	Included											
C	Remove pressure indicator	6	EA	Included											
C	Remove flow indicator	6	EA	Included											
16															
C	Remove pneumatic actuated valves	10	EA	Included											
C	Remove flow/density trans. sensor	1	EA	Included											
C	Remove level switches	8	EA	Included											
C	Remove level transmitter	3	EA	Included											
C	Remove instr. piping for valves	10	EA	Included											
C	Remove instr. piping for transmitter	3	EA	Included											
C	Remove instr. piping for flow trans.	1	EA	Included											
C	Remove pressure switch	2	EA	Included											
C	Remove flow switch	2	EA	Included											
C	Remove orifice plate	1	EA	Included											
17															
C	Remove diff. pressure trans.	4	EA	Included											
C	Remove instr. piping for trans.	4	EA	Included											
18															
C	Remove pneumatic actuated valves	18	EA	Included											
C	Remove flow transmitter	3	EA	Included											
C	Remove orifice plate	1	EA	Included											
C	Remove level control valve	4	EA	Included											
C	Remove level switches	18	EA	Included											
C	Remove level transmitter	5	EA	Included											
C	Remove ph element/ transmitter	4	EA	Included											
C	Remove conduit	2000	LF	0.033	132	20.25					$2,670				$2,670
C	Remove cable tray	600	LF	0.021	25	20.25					$510				$510
C	Pipe tubing	1000	LF	0.04	80	20.25					$1,620				$1,620
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		237	20.25					$4,800				$4,800

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CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
18	Instrumentation														
C	Remove temperature indicator/ transmitter	6	EA	Included											
C	Remove instr. piping for valves	18	EA	Included											
C	Remove process pipe for level trans.	5	EA	Included											
C	Remove instr. pipe for flow transmitter	3	EA	Included											
C	Remove indicator	6	EA	Included											
C	Remove temperature indicator	2	EA	Included											
C	Remove flow indicator	5	EA	Included											
73															
C	Remove HVAC controls	1	LOT	20	40	20.25					$810				$810
76															
C	Remove HVAC controls	1	LOT	20	40	20.25					$810				$810
90															
C	Remove DCS	1	EA			20.25									
C	Remove motor operated valves	4	EA			20.25									
92															
C	Remove fire alarm & evacuation system	1	LOT	40	80	20.25					$1,620				$1,620
93															
C	Remove real time SOx monitor	1	EA	2	4	20.25					$80				$80
C	Remove hps control station	1	EA	2	4	20.25					$80				$80
C	Remove auto radio counter	2	EA	2	8	20.25					$160				$160
C	Remove passive radon monitor	9	EA	2	36	20.25					$730				$730
C	Remove radon working lvl monitor	6	EA	2	24	20.25					$490				$490
C	Remove body frisker	3	EA	2	12	20.25					$240				$240
C	Remove air sampling station (CAM)	12	EA	2	48	20.25					$970				$970
C	Remove tool comtam. monitor	2	EA	2	8	20.25					$160				$160
C	Remove 8" butterfly valves	30	EA	2	120	20.25					$2,430				$2,430
73	HVAC STACK														
C	Remove isokinectic monitor	1	EA	10	20	20.25					$410				$410
18	OFF-GAS STACK														
C	Remove isokinectic monitor	1	EA	10	20	20.25					$410				$410
	ke-off Allowance														
	Total Direct Cost	1	LOT		464	20.26					9,400				$9,400

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08/20/99

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Electrical														
mC	480v pr. &mtr. feeders 19ea*500#	4.75	tn	20	182	20.25					$3,690				$3,690
mC	Conduit & wiring 4" & <	60500	lf	0.016	1854	20.25					$37,540				$37,540
mC	480v distribution MCC 1000# * 5ea	2.5	tn	20	96	20.25					$1,940				$1,940
mC	Transformer 3750kv 1ea * 2000#	1	tn	20	38	20.25					$770				$770
mC	Utility metering cabinet 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Generator 700kw 1ea * 1ton	1	tn	20	38	20.25					$770				$770
mC	Transfer switch 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Stl. pole <18"dia 40'long 20ea.	4	tn	20	153	20.25					$3,100				$3,100
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		2,381	$20.24					48,200				$48,200

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COST IMPACT MATRIX SHEET

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Estimate No.: C4981202R2
Project: Vit 2 D&D Joule Heated Vitrification
Client: DOE
WBS: 2.1.3.G.P

Date: 20-Aug-99
Estimator: Wagner
Location: FERNALD
TASK NO.: 4S11B

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
$4,887,570	Mobilization Cost labor		Mobilization Cost matl		Mobilization Cost equip		Below Grade labor		PPE ppe		Above Grade labor	
Cost Drivers	Base $	$57,690	Base $	$121,840	Base $	$140,310	Base $	$543,330	Base $	$227,400	Base $	$2,612,170
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor							-5%	15%			-5%	20%
Material Pricing			-5%	15%								
Equipment Rental					-5%	15%						
Subcontract $'s												
Quantity Variation			-5%	10%	-5%	10%						
Contamination							-5%	15%	-5%	15%		
Environmental												
Schedule											-5%	10%
Project Definition	-10%	25%					-5%	10%	-5%	10%		
Range - %	-10%	25%	-10%	25%	-10%	25%	-15%	40%	-10%	25%	-10%	30%
Range - $	$51,921	$72,113	$109,656	$152,300	$126,279	$175,388	$461,831	$760,662	$204,660	$284,250	$2,350,953	$3,395,821
Distribution	U		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Demobilization Cost labor		Demobilization Cost s/c		Demobilization Cost matl		Demobilization Cost equip					
Cost Drivers	Base $	$120,680	Base $	$182,710	Base $	$22,070	Base $	$859,370	Base $	$0	Base $	$0
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor	-5%	20%			-5%	15%						
Material Pricing												
Equipment Rental							-5%	15%				
Subcontract $'s			-5%	15%								
Quantity Variation												
Contamination												
Environmental												
Schedule	-5%	10%										
Project Definition			-5%	10%	-5%	10%	-5%	10%				
Range - %	-10%	30%	-10%	25%	-10%	25%	-10%	25%	0%	0%	0%	0%
Range - $	$108,612	$156,884	$164,439	$228,388	$19,863	$27,588	$773,433	$1,074,213	$0	$0	$0	$0
Distribution	U		U		U		U					
Correlation Rank												

Analyst: _____

Client: _____

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APPENDIX "A"

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

SITE SPECIFIC

EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			80.0%	20.0%	0.16
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
WORK WEEK	<---- MULTIPLE SHIFTS-											
50 HOUR WORK WEEK	//////////	//////////	//////////	OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS	4-10s / 5-8s			100.0%	15.0%	0.15
	//// MULTIPLE-SHIFT ////									0.0%	0.0%	0
60 HOUR WORK WEEK	//////////	//////////	OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK 2ND SHIFT 3RD SHIFT			3RD SHIFT		2ND SHIFT		OR ONE SHIFT ONLY			100.0% 100.0%	3.0% 5.0%	0.03 0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	89.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 89.4%

MULTIPLIER (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.12

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EFFICIENCY FACTORS

:OJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	12%	12.0
S/T = BASE UNIT MANHOURS		112
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		112
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		112
• PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	23.00%	26	71.00%	80	79.00%	88	147.00%	165	326.00%	365
AS A MULTIPLIER)/TOTAL HRS	1.23	137.8	1.71	191.5	1.79	200.5	2.47	276.6	4.26	477.1
OTAL MULTIPLIER w/SITE PROD.	1.3776		1.9152		2.0048		2.7664		4.7712	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

	14.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	48.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

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EFFICIENCY FACTORS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.81	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.23	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DA 4 - 10's		600	600	600	600	600
ADDITN'L SITE SAFETY MEETINGS NOT INCLD. IN BASE	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING	QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS	QUANTITY	2	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		30	30	30	30	45
MOBILIZATION - ROUND TRIPS	QUANTITY	4	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		60	60	60	60	60
COOLDOWNS PER DAY	QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS) 33.33%	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		485	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

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APPENDIX "C"

HEALTH PHYSICS

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PROJECT:
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CA		$'s	*	MAN DAYS	MAT'L.$'s	PPE LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1547	$20,699	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1547	$20,699	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	3	1547	$1,114	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	1547	$1,207	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	1547	$4,734	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	3	1547	$54,485	C / C+/ B	
SUB-TOTAL		22.18	3		$102,938		
				$/MD =	$66.54		

PPE LEVEL mC FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	PPE LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & B	PR	4.46	3	3281	$43,900	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	3281	$2,362	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	3281	$2,559	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	3281	$10,040	mC
SUB-TOTAL		5.98	3		$58,861	
				$/MD =	$17.94	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	0	$0	C/B
THERMO STRIPS	EA	50.00	6	0	$0	C/B
SUB-TOTAL					$0	

MAT'L.$'s
$161,800

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDE AS PART OF PROJECT COSTS AT THIS TIME.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	50	200	$20.27	$4,050
ANNUAL PHYSICALS	0	4	50	0	$20.27	$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	50	50	$20.27	$1,010
SUB-TOTAL						$5,060

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	6	1	50	278	$20.27	$5,630
SUB-TOTAL						$5,630

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR $'s
	45	2	90	$20.27	$1,800

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.004274	50	0.2137	210

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	1.0%	$1,515,170	$15,200
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	1.0%	$1,515,170	$15,200

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$42,900	$161,800	$204,700

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ACTIVITY DURATIONS

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FLUOR DANIEL FERNALD

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	29-Dec-98	01-Jan-2009	19-Jun-2009	05-Dec-2009	11.12	MONTHS
					0	MONTHS
TOTAL					11.1	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	125.8	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS					0	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

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ESTIMATE SUMMARY SHEET

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIPMENT $	TOTAL $
Mobilization Cost	820		$16,126		$12,790	$741	$29,658
Below Grade	8,093		$151,884				$151,884
Above Grade	38,913		$730,216				$730,216
Demobilization Cost	1,780		$33,736	$7,600	$2,317	$4,541	$48,194
DIRECT FIELD COSTS TOTAL	49,606	$18.79	$931,962	$7,600	$15,107	$5,283	$959,952
SUPERVISION - CONTRACTOR & PERDIUM	17,360		$384,159	$120,113			$504,272
SMALL TOOLS & CONSUMABLES 3%					$27,989		$27,989
EQUIP. RENTAL (See Equipment Schedule)						$653,950	$653,950
TEMPORARY FACILITIES 6%	1,488		$27,989		$27,989		$55,979
TEMPORARY UTILITY HOOK-UP 3%	967		$18,165		$9,824		$27,989
JOB CLEAN-UP 6%	2,232		$41,984		$13,995		$55,979
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTOR							
HEALTH PHYSICS S/C	2,116		$39,760		$149,956		$189,716
CERCLA - 40 HRs/FTE	1,250		$23,448				$23,448
GET/SITE ACCESS & JOB SPECIFIC TRAINING	900		$16,868				$16,868
PAYROLL BURDENS & BENEFITS 57%	-	-	$846,076				$846,076
OVERHEAD & PROFIT 20%	-	-		$672,486			$672,486
BOND 1%	-	-		$40,316			$40,316
SALES TAX 6%	-	-			$14,736	$39,574	$54,310
INDIRECT FIELD COSTS TOTAL	26,314		$1,398,449	$832,915	$244,490	$693,524	$3,169,378
DIRECT & INDIRECT FIELD COSTS TOTAL	75,920	$41.67	2,330,411	840,515	259,597	698,807	$4,129,330
WASTE DISPOSITION MGMT. - FD FERNALD			$898,390	$1,504,026	$2,199,171	$35,744	$4,637,331
OFF-SITE DISPOSAL COSTS (Commercial)							
WASTE MANAGEMENT COSTS TOTAL			$898,390	$1,504,026	$2,199,171	$35,744	$4,637,331
PROJECT CLOSEOUT			$79,543	$13,973			$93,516
FIELD PREPARATION							
CONSTRUCTION MANAGEMENT - FD FERNALD			$1,470,266	$146,212	$33,211		$1,649,689
FD FERNALD FIELD SUPPORT COSTS TOTAL			$1,549,809	$160,185	$33,211		$1,743,205
ENGINEERING/DESIGN/INSPECTION - FD FERNALD			$115,679	$9,006	$6,326		$131,011
ENGINEERING COSTS TOTAL			$115,679	$9,006	$6,326		$131,011
SALES TAX - FD FERNALD							$133,923
SUB-TOTAL (BASE ESTIMATE)							$10,774,799
RISK BUDGET 9.7%							$1,045,200
TARGET ESTIMATE (FY96 DOLLARS)							$11,819,999
CONTINGENCY 10.9%							$1,174,500
NTS BURIAL FEE							$4,181,722

(De-escalated for Microframe Input Only)

ESTIMATE PERFORMED BY ESTIMATING SERVICES

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ESTIMATE SUMMARY SHEET

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: Wagn
LOCATION: FER
TASK NO.: 4S1

FACTORS

FIXED PRICE SUBCONTRACT	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
DFC DOLLARS	$931,862	$7,600	$15,107	$5,283	$149,956	$1,109,908
IFC COST FACTOR	2.5005	16.8049	6.2822	124.7895	-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2086	1.2086	1.2086	1.2086	1.2086	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	3.0222	20.3109	8.0485	159.8742	1.2812	
BASE ESTIMATE $'s	$2,816,612	$154,358	$121,587	$844,577	$192,117	$4,129,251
RISK BUDGET FACTOR	1.0970	1.0970	1.0970	1.0970	1.0970	
TARGET ESTIMATE FACTOR	3.3154	22.2811	8.8292	175.3820	1.4054	
FPS TARGET ESTIMATE (FY96 DOLLARS)	$3,089,824	$169,331	$133,381	$926,501	$210,752	$4,529,789

(De-escalated for Microframe Input Only)

NOTE:
1.)The above costs represent constant FY dollars de-escalated to FY96 for input to microframe.

2.) If FD Fernald Support dollars appear below, and were generated as a percenatage of the DFC, Risk Budget would apply and these dollars would be de-escalated to FY96. Indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the NO box.
If the FDF Support costs are supported by LOE estimates, use those estimates for input to microframe, enter 'SPACE BAR' in the Yes Box and an X in the No Box

DOES RISK BUDGET APPLY TO FD FERNALD SUPPORT COSTS IF YES, DE-ESCALATION IS APPLIED, OTHERWISE IT IS NOT.	YES	NO X

FD FERNALD SUPPORT COSTS	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
FD FERNALD PROJECT MGMT.						$93,516
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	[illegible]00
TOTAL PM						[illegible]20
FD FERNALD CONSTRUCTION MGMT.						$1,[illegible]689
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL CM						$1,649,690
FD FERNALD WASTE PROGRAM MGMT.						$4,637,331
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM						$4,637,330
FD FERNALD RSO						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO						
FD FERNALD ENGINEERING/DESIGN/INSPECTION						$131,011
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.						$131,010
A/E ENGINEERING/DESIGN/INSPECTION						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD A/E						
SUB-TOTAL PROJECT TARGET EST. (FY96 DOLLARS)						$11,041,339

These dollars will not match microframe reports due to differences in labor rates and constant FY dollars for other costs and the addition of escalation and G & A to the microframe reports.
Risk Budget requirements for FD Fernald Support Costs needs to be determined on an individual basis for each project they support and may not apply if supported by an LOE estimate.
The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

OTHER FD FERNALD SALES TAX - 6%						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER FD FERNALD SALES TAX						

TOTAL PROJECT TARGET EST.	(FY96 DOLLARS)	$11,041,339
	(De-escalated for Microframe Input Only)	

000177

ESTIMATE SUMMARY SHEET

PROJECT: Vit 2 D&D Joule Heated Vitrification
ESTIMATE NO.: C4981202R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

Direct Field Cost w/FACTORS

AND RISK BUDGET: YES X | NO

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PAY ITEM NO.	DESCRIPTION	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
		(ASSIGN OR PRORATE PPE MAT'L.$'s)-->>					
	Mobilization Cost	16126		12790	741.44	149956	179614
		$53,470		$112,920	$130,040	$210,750	$507,180
	Below Grade	151884					151884
		$503,560					$503,560
	Above Grade	730216					730216
		$2,420,960					$2,420,960
	Demobilization Cost	33736	7600	2317	4541		48194
		$111,850	$169,330	$20,460	$796,470		$1,098,110
TOTAL DIRECT FIELD COSTS w/FACTORS (FY96 DOLLARS)		$3,089,840	$169,330	$133,380	$926,510	$210,750	$4,529,810

(De-escalated for Microframe Input Only)

NOTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.

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SUBCONTRACTOR'S STAFFING PLAN

Joule Heated Vitrification
Vit 2 BELOW GRADE

Start — Finish — Weeks 8

	No. Req.	Weeks	Hours	Cost/Hr	Proj. Cost
Project Manager *	1	8	320	$45.19	$14,500
Project Superintendent *	1	8	320	$31.92	$10,200
Project Engineer *	1	8	320	$20.71	$6,600
Safety Engineer *	1	8	320	$19.75	$6,300
QA/QC Manager *	1	8	320	$18.51	$5,900
Office Administration	1	8	320	$15.75	$5,000
Project Scheduler *	1	8	320	$27.10	$8,700
Clerk/Sect.	1	8	320	$12.00	$3,800
Total	7		2,560	$23.83	$61,000
Perdiem/Subsistance Noted by " * " Rate per week = $400		48 Weeks		$400.00	$19,200
Spread Sheet Total					$80,200

Note: Cost /Hr rates are from 1997 S/C supplied by others.
Note: Rates were escalated 5% for 1998

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SUBCONTRACTOR'S STAFFING PLAN

Joule Heated Vitrification
Vit 2 ABOVE GRADE

Start — Finish — Weeks 46

	No. Req.	Weeks	Hours	Cost/Hr	Proj. Cost
Project Manager *	1	46	1,840	$45.19	$83,200
Project Superintendent *	1	46	1,840	$31.92	$58,700
Project Engineer *	1	46	1,840	$20.71	$38,100
Safety Engineer *	1	46	1,840	$19.75	$36,300
QA/QC Manager *	1	46	1,840	$18.51	$34,100
Office Administration	1	46	1,840	$15.75	$29,000
Project Scheduler *	1	46	1,920	$27.10	$52,000
Clerk/Sect.	1	46	1,840	$12.00	$22,100
Total	7		14,800	$23.89	$353,500
Perdiem/Subsistance Noted by " * " Rate per week = $400		276 Weeks		$400.00	$110,400
Spread Sheet Total					$463,900

Note: Cost /Hr rates are from 1997 S/C supplied by others.
Note: Rates were escalated 5% for 1998

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000181

FY98 DC [redacted] ICROFRAME INPUT

PROJECT: D & D Vit 2 Joule Heated Melter
PROJECT MGR: J. Stone
WBS NO:
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DANI[redacted]LD
SUPPORT COST ES1 1MATE/WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF D&D Closeout Estimate
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-Aug-99
CAM: R. Maurer
ESTIMATOR: T. Wagner
PREPARER: M. Stevens
DURATION: 3 Months
ISSUE DATE: 08-Jan-99

RESOURCES			Wage Rate	TOTAL PROJECT	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	TOTAL
	HOURS PER MONTH/DURATION			151	151	151	151	151	151	151	151	151	151	151	151	1813
NAME - Optional	KEY RESOURCE CODE															
	ADMIN	FTE		0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Photo/Admin	HOURS	$38.62	188.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	188.88
		$		$7,295	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,295
	ENG	FTE		1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$43.59	536.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	536.41
		$		$23,382	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$23,382
	ENVSC	FTE		0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$36.36	113.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	113.33
		$		$4,121	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,121
	DRFT	FTE		0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$25.70	30.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.22
		$		$777	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$777
	WASTE	FTE		0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RAD ENG	HOURS	$34.40	37.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.78
		$		$1,300	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,300
	PRJC	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COST/SCH/WPM	HOURS	$32.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	CM	FTE		0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PM/CCM	HOURS	$47.69	309.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	309.76
		$		$14,772	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$14,772
	CE	FTE		0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$40.58	256.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	256.87
		$		$10,419	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10,419
	CC	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$31.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	ACON	FTE		0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	CA	HOURS	$32.60	377.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	377.75
		$		$12,315	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$12,315
	QA	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$34.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	S&H	FTE		0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	H/SAFETY	HOURS	$37.01	151.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	151.10
		$		$5,592	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,592

000182

F-8113

FY96 DOLLARS FOR MICROFRAME INPUT

PROJECT: D & D Vit 2 Joule Heated Melter
PROJECT MGR: J. Stone
WBS NO:
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DANIEL FERNALD
SUPPORT COST ESTIMATE/WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF D&D Closeout Estimate
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-Aug-99
CAM: R. Maurer
ESTIMATOR: T. Wagner
PREPARER: M. Stevens
DURATION: 3 Months
ISSUE DATE: 08-Jan-99

HOURS PER MONTH/DURATION			151	151	151	151	151	151	151	151	151	151	151	151	1813
RESOURCES		Wage Rate	TOTAL PROJECT	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	TOTAL
S&HTCH	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$24.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
RAD	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
RAD TECH	HOURS	$26.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
LAB	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$33.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
LABTCH	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LAB SAMPLE COL	HOURS	$22.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MAINT	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
OTHER	HOURS	$34.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CRFT	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PORTER/LAUNDRY	HOURS	$25.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MVOH	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$23.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
UTIL	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$22.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SECGD	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$18.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CLRK	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$18.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL LABOR (FTE'S)			4.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL LABOR (HOURS)			2002.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2002.10
TOTAL LABOR ($)			$79,972	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$79,972

000183

FY98 D MICROFRAME INPUT

PRO... D & D Vit 2 Joule Heated Melter
PROJECT MGR: J. Stone
WBS NO:
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DANI... LD
SUPPORT COST ES...ATE/WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF D&D Closeout Estimate
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-Aug-99
CAM: R. Maurer
ESTIMATOR: T. Wagner
PREPARER: M. Stevens
DURATION: 3 Months
ISSUE DATE: 08-Jan-99

HOURS PER MONTH/DURATION		151	151	151	151	151	151	151	151	151	151	151	151	1813
RESOURCES	Wage Rate	TOTAL PROJECT	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	TOTAL
MATERIALS 1.0275	3XX													
	383	$0												$0
	387	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	389	$0												$0
	399	$0												$0
		$0												$0
														$0
SUBTOTAL MATERIAL		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Tax	394	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL MATERIAL		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBCONTRACTS (NON-CONSTRUCTION)	4XX													
	405	$0												$0
	451	$0												$0
	465	$0												
TEAMING PARTNERS HOME OFFICE (Hours)	$93.03													0
TEAMING PARTNERS HOME OFFICE (Dollars)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
TEAMING PARTNERS SITE (Hours)	$66.58	211												211
TEAMING PARTNERS SITE (Dollars)		$14,048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$14,048.38
A&E Subcontracts														
		$0												$0
														$0
TOTAL SUBCONTRACTS		$14,048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$14,048
ODC's														
Travel	600													$0
Training	700													$0
Relocation	700													$0
Other														$0
TOTAL ODC's		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
GRAND TOTAL HOURS		2,213.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,213.10
GRAND TOTAL DOLLARS		$94,020	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$94,020

SIGNATURES NEEDED

CAM _____

ESTIMATING _____

CONTROL TEAM _____

DOES NOT INCLUDE ANY G&A OR ESCALATION COSTS.

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8113

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EQUIPMENT RENTAL AND OPERATING COST

Joule Heated Vitrification
Vit 2 BELOW GRADE

	EACH	MONTHS REQ.	COST PER MO.	TOTAL	OPERATING COST @ 20 %
Pick-up Truck	1	2	$800	$1,600	$320
Equipment 1 1/2cy Backhoe w/ Ram Attached	1	2	$9,148	$18,300	$3,660
Front End Loader (Rubber Tire Type)	1	2	$2,900	$5,800	$1,160
Skid Stear Loader	1	2	$1,500	$3,000	$600
Excavator	1	2	$15,000	$30,000	$6,000
5800 Link-Belt w Concrete Crusher	1	2	$25,000	$50,000	$10,000
Freight (In & Out)	1	LOT		$10,000	
				$118,700	$21,700
Equipment Rental Operating / Maint. Cost				$140,400	

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EQUIPMENT RENTAL AND OPERATING COST

Joule Heated Vitrification
Vit 2 ABOVE GRADE

	EACH	MONTHS REQ.	COST PER MO.	TOTAL	OPERATING COST @ 20 %
Scissor Lift	6	4	$1,450	$34,800	$6,960
Man Lift 60' - 70'	1	1	$3,995	$4,000	$800
Pick-up Truck	2	11	$800	$17,600	$3,520
Equipment 1 1/2cy Backhoe w/ Ram Attached	1	4	$9,148	$36,600	$7,320
Front End Loader (Rubber Tire Type)	1	4	$2,900	$11,600	$2,320
Fork Lift	1	8	$1,600	$12,800	$2,560
Skid Stear Loader	1	8	$1,500	$12,000	$2,400
5800 Link-Belt w Rotating Shear/Crusher	1	4	$25,000	$100,000	$20,000
5800 Link-Belt w Concrete Crusher	2	4	$25,000	$200,000	$40,000
Air Compressor	1	8	$500	$4,000	$800
Pressure Washer	2	8	$812	$13,000	$2,600
Contractor Trailer	1	11	$600	$6,600	NONE
Scaffolding	8	1 LOT	$600	$4,800	NONE
Freight (In & Out)	1	LOT		$18,100	
				$475,900	$89,300

Equipment Rental Operating / Maint. Cost $565,200

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000187

FY98 DOLLAR... ...OFRAME INPUT

PROJECT: Vit 2 D&D Joule Heated Vitrification
PROJECT MGR: M. Stevens
WBS NO: 2.1.3.G.P.
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DANIE... ...LD
SUPPORT COST ESTIMATE/WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF D&D Planning Engineering Estimate
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-Aug-99
CAM: P. Courtney
ESTIMATOR: T. Wagner
PREPARER: M. Stevens
DURATION: 11 Months

RESOURCES			Wage Rate	TOTAL PROJECT	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	TOTAL
NAME - Optional	KEY RESOURCE CODE															
	ADMIN	FTE		0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$38.62	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00
		$		$9,269	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$9,269
	ENG	FTE		0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$43.59	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00
		$		$10,462	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10,462
	ENVSC	FTE		0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$36.36	90.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00
		$		$3,272	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,272
	DRFT	FTE		0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$25.70	48.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.00
		$		$1,234	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,234
	WASTE	FTE		0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$34.40	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00
		$		$8,256	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$8,256
	PRJC	FTE		0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$32.96	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00
		$		$7,910	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,910
	CM	FTE		1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$47.69	480.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	480.00
		$		$22,891	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$22,891
	CE	FTE		1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$40.56	480.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	480.00
		$		$19,469	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$19,469
	CC	FTE		0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$31.79	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00
		$		$7,630	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,630
	ACQN	FTE		0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$32.60	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00
		$		$7,824	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,824
	QA	FTE		0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$34.57	140.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	140.00
		$		$4,840	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,840
	S&H	FTE		0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		HOURS	$37.01	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00
		$		$8,882	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$8,882

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FY98 DOLLARS FOR MICROFRAME INPUT

PROJECT: Vit 2 D&D Joule Heated Vitrification
PROJECT MGR: M. Stevens
WBS NO: 2.1.3.G.P.
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DANIEL FERNALD
SUPPORT COST ESTIMATE/WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF D&D Planning Engineering Estimate
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-Aug-99
CAM: P. Courtney
ESTIMATOR: T. Wagner
PREPARER: M. Stevens
DURATION: 11 Months

MATERIALS	3XX													
Material	383	$6,000												$6,000
Equipment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		$0												$0
														$0
														$0
														$0
SUBTOTAL MATERIAL		$6,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,000
Sales Tax	394	$360	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$360
TOTAL MATERIAL		$6,360	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,360
SUBCONTRACTS (NON-CONSTRUCTION)	4XX													
	405	$0												
	451	$0												$0
	465	$0												$0
TEAMING PARTNERS HOME OFFICE (Hours)	$93.03													
TEAMING PARTNERS HOME OFFICE (Dollars)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	0
TEAMING PARTNERS SITE (Hours)	$66.58	138												$0.00
TEAMING PARTNERS SITE (Dollars)		$9,055	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	138
A&E Subcontracts														$9,054.88
		$0												
														$0
TOTAL SUBCONTRACTS		$9,055	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ODC's														$9,055
Travel	600													
Training	700													$0
Relocation	700													$0
Other														$0
TOTAL ODC's		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
GRAND TOTAL HOURS		3,294.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,294.00
GRAND TOTAL DOLLARS		$131,717	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$131,717

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SIGNATURES NEEDED

CAM _____

DOES NOT INCLUDE ANY G&A OR ESCALATION COST

000189

FY98 F[redacted] MICROFRAME INPUT
PR[redacted] 2 D&D Joule Heated Vitrification
PRO[redacted]GR:
WBS NO: 2.1.3.G.P.
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DAN[redacted]LD
SUPPORT COST [redacted]/WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF Construction Management Est.
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-[redacted]
CAM: M. Stevens
ESTIMATOR: T. Wagner
PREPARER: M.Stevens
DURATION: 13.5 Months
ISSUE DATE:

RESOURCES		Wage Rate	TOTAL PROJECT	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	TOTAL
HOURS PER MONTH/DURATION			151	151	151	151	151	151	151	151	151	151	151	151	1813
NAME - Optional	KEY RESOURCE CODE														
ADMIN	FTE		0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$38.62	1225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1225.00
[redacted]	$		$47,310	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$47,310
ENG	FTE		1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$43.59	2450.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2450.00
[redacted]	$		$106,796	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$106,796
ENVSC	FTE		0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$36.36	1225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1225.00
[redacted]	$		$44,541	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$44,541
DRFT	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$25.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[redacted]	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WASTE	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$34.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[redacted]	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
PRJC	FTE		1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
COST/SCH/WPM	HOURS	$32.96	2450.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2450.00
[redacted]	$		$80,752	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$80,752
CM	FTE		1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PM CCM	HOURS	$47.69	3175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3175.00
[redacted]	$		$151,416	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$151,416
CE	FTE		2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$40.56	4900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4900.00
[redacted]	$		$198,744	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$198,744
CC	FTE		0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$31.79	1525.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1525.00
[redacted]	$		$48,480	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$48,480
ACQN	FTE		0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$32.60	960.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00
[redacted]	$		$31,296	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$31,296
QA	FTE		0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted]	HOURS	$34.57	960.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960.00
[redacted]	$		$33,187	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$33,187
S&H	FTE		1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[redacted] SAFETY	HOURS	$37.01	2720.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2720.00
[redacted]	$		$100,667	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$100,667

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FY98 DOLLARS FOR MICROFRAME INPUT

PROJECT: Vit 2 D&D Joule Heated Vitrification
PROJECT MGR:
WBS NO: 2.1.3.G.P.
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DANIEL FERNALD
SUPPORT COST ESTIMATE/WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF Construction Management Est.
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-Aug-99
CAM: M. Stevens
ESTIMATOR: T. Wagner
PREPARER: M.Stevens
DURATION: 13.5 Months
ISSUE DATE:

HOURS PER MONTH/DURATION			151	151	151	151	151	151	151	151	151	151	151	151	1813
RESOURCES		Wage Rate	TOTAL PROJECT	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	TOTAL
S&HTCH	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$24.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
RAD	FTE		3.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
RAD TECH	HOURS	$26.47	7093.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7093.98
	$		$187,778	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$187,778
LAB	FTE		1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$33.51	2548.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2548.13
	$		$88,152	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$88,152
LABTCH	FTE		0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LAB SAMPLE COLL	HOURS	$22.46	1284.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1284.26
	$		$28,844	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,844
MAINT	FTE		1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
OTHER	HOURS	$34.00	2364.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2364.66
	$		$80,398	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$80,398
CRFT	FTE		2.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PORTER/LAUNDRY	HOURS	$25.32	4708.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4708.94
	$		$119,230	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$119,230
MVOH	FTE		1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$23.83	2364.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2364.66
	$		$56,350	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$56,350
UTIL	FTE		1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$22.37	2364.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2364.66
	$		$52,897	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$52,897
SECGD	FTE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$18.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CLRK	FTE		0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	HOURS	$18.18	1284.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1284.26
	$		$23,348	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$23,348
TOTAL LABOR (FTE'S)			22.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL LABOR (HOURS)			45603.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45603.83
TOTAL LABOR ($)			$1,479,186	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,479,186

FY96 DOE [redacted] CROFRAME INPUT

PROJE[redacted] 2 D&D Joule Heated Vitrification
PROJECT MGR:
WBS NO: 2.1.3.G.P.
CTRL ACCT:
CHARGE NO: 4S11B

FLUOR DANIE[redacted]D
SUPPORT COST EST[redacted]WORKSHEET
FOR ACTIVITY BASED ESTIMATING
DISCRETE WORK
FDF Construction Management Est.
FOR ESTIMATING PURPOSES ONLY 1 FTE EQUALS 1813 HRS

DATE: 20-Aug-[redacted]
CAM: M. Stevens
ESTIMATOR: T. Wagner
PREPARER: M.Stevens
DURATION: 13.5 Months
ISSUE DATE:

HOURS PER MONTH/DURATION		151	151	151	151	151	151	151	151	151	151	151	151	1813
RESOURCES	Wage Rate	TOTAL PROJECT	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	TOTAL
MATERIALS	3XX													
Supplies $3,000 per month 10.5	300's	$31,500												$31,500
Equipment- Dunage		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		$0												$0
														$0
														$0
														$0
SUBTOTAL MATERIAL		$31,500	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$31,500
Sales Tax	394	$1,890	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,890
TOTAL MATERIAL		$33,390	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$33,390
SUBCONTRACTS (NON-CONSTRUCTION)	4XX													
														$0
SUBCONTRACTS $7,000 / Month	10.5	$73,500												$73,500
FERMSI $7,000 / Month	10.5	$73,500												
3840														
TEAMING PARTNERS HOME OFFICE (Hours)	$93.03													0
TEAMING PARTNERS HOME OFFICE (Dollars)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
TEAMING PARTNERS SITE (Hours)	$66.58	0												0
TEAMING PARTNERS SITE (Dollars)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00
A&E Subcontracts														
		$0												$0
														$0
TOTAL SUBCONTRACTS		$147,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$147,000
ODC's														
Travel	600													$0
Training	700													$0
Relocation	700													$0
Other														$0
TOTAL ODC's		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
GRAND TOTAL HOURS		45,603.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45,603.53
GRAND TOTAL DOLLARS		$1,658,576	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,658,576

SIGNATURES NEEDED

CAM _____

ESTIMATING _____

CONTROL TEAM _____

DOES NOT INCLUDE ANY G&A OR ESCALATION COSTS.

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ESTIMATE SUMMARY SHEET

FLUOR DANIEL FERNALD

8113

PROJECT:	Vendor "B" (TTA/RCS D & D)	DATE:	20-Aug-99
ESTIMATE NO.:	C4981003	ESTIMATOR:	T Wagner
CLIENT:	DOE	LOCATION:	FERNALD
BS NO.:	2.1.3.G.0	TASK NO.:	4SWRA

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO.7	Premobilization/Mobilization	820		$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System	1,140		$23,100				$23,100
II	RCS Phase I, II, & III	1,743		$35,300				$35,300
III	Silo Waste Retrieval System	2,204		$44,600				$44,600
IV	Transfer Tank Area	4,520		$91,500				$91,500
	Demobilization Cost	1,400		$28,800	$8,200	$2,500	$3,500	$43,000
DIRECT FIELD COSTS TOTAL		11,827	$20.35	$240,700	$8,200	$16,300	$4,300	$269,500
SUPERVISION - CONTRACTOR - STAFF		8,960		$209,800				$209,800
SMALL TOOLS & CONSUMABLES @ 3%						$7,200		$7,200
MISC. EQUIP. RENTAL (See Equipment Schedule)							$278,400	$278,400
PERDIEM / SUBSISTANCE					$76,800			$76,800
TEMPORARY FACILITIES & UTILITIES		532		$10,800		$10,800		$21,600
JOB CLEAN-UP 6%		532		$10,800		$3,600		$14,400
SAFETY 3%		231		$4,700		$2,500		$7,200
EALTH PHYSICS S/C		1,145		$23,300		$11,000		$34,300
RCLA - 40 HRs/FTE		760		$15,500				$15,500
/SITE ACCESS & JOB SPECIFIC TRAINING		380		$7,700				$7,700
PAYROLL BURDENS & BENEFITS		-	-	$298,300				$298,300
OVERHEAD & PROFIT		-	-		$248,100			$248,100
BOND		-	-		$14,900			$14,900
SALES TAX		-	-			$3,100	$17,000	$20,100
INDIRECT FIELD COSTS TOTAL		12,540		$580,900	$339,800	$38,200	$295,400	$1,254,300
DIRECT & INDIRECT FIELD COSTS TOTAL		24,367	$33.72	$821,600	$348,000	$54,500	$299,700	$1,523,800
WASTE DISPOSITION - MGMT. - FD FERNALD				$1,431,356	$2,396,284	$3,503,822	$56,950	$7,388,411
WASTE MANAGEMENT COSTS TOTAL				$1,431,400	$2,396,300	$3,503,800	$56,900	$7,388,400
PROJECT MANAGEMENT - FLUOR DANIEL FERNALD				$963,200	$117,300	$26,600	-	$1,107,100
FIELD PREPARATION								
PROJECT CLOSE OUT				$94,200	$3,100			$97,300
FD-FERNALD FIELD SUPPORT COSTS TOTAL				$1,057,400	$120,400	$26,600		$1,204,400
ENGINEERING, PLANNING, PROCUREMENT - FLUOR DANIEL FERNALD				$123,800	$9,500	$6,700		$140,000
ENGINEERING, PLANNING & PROCUREMENT COSTS TOTAL				$123,800	$9,500	$6,700		$140,000
SALES TAX - FLUOR DANIEL FERNALD						$212,200		$212,200
SUB-TOTAL (BASE ESTIMATE)								$10,468,800
RISK BUDGET 7.0%								$106,700
TARGET ESTIMATE - ITEM NO. 7					(FY 99 DOLLARS)			$10,575,500
S BURIAL FEE ITEM NO.30								$6,662,514

ATE PERFORMED BY ESTIMATING SERVICES

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost				820						$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System				1,140						$23,100				$23,100
II	RCS Phase I, II, & III				1,743						$35,300				$35,300
III	Silo Waste Retrieval System				2,204						$44,600				$44,600
IV	Transfer Tank Area				4,520						$91,500				$91,500
	Demobilization Cost				1,400						$28,800	$8,200	$2,500	$3,500	$43,000
	Subtotal Direct Cost	1	LOT		11,827						$240,700	$8,200	$16,300	$4,300	$269,500

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Utilities to Building	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		500	20.27			1500	3.50	$10,140		$1,500	$1,800	$13,440
D	Remove Electrical to Trailer	1	lot		120	21.12				300	$2,530			$310	$2,840
D	Remove Utilitries to Building	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000.00			$3,240	$8,220			$11,460
	Total				1,400						$28,800	$8,200	$2,500	$3,500	$43,000

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	Sub Item	Description	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
I	Full Scale Mock-up System						20.25									
D	A	Blower Skid	0.2	tn	150	41	20.25					$830				$830
D	B	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
	C	Waste Retrieval Equipt					20.25									
D		- Pipe Bridge from Silo 4 to TTA	15	tn	9	186	20.25					$3,770				$3,770
D		Sluicer Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Deployment Equipment	3	tn	40	165	20.25					$3,340				$3,340
D		Retrieval Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Discrete Object Housing	1.5	tn	40	83	20.25					$1,680				$1,680
D		CATS Housing	1	tn	60	83	20.25					$1,680				$1,680
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
D		Piping	700	lf	0.105	101	20.25					$2,050				$2,050
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		CAmera System	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	104						$2,100				$2,100
		Subtotal Direct Cost		LOT		1140	20.26					23,100				$23,100

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II, & III															
D	A	Building - Concrete (380lf	355	cy	1.400	685	20.25					$13,870				$13,870
C	B	Equipt - Carbon Beds	9.2	tn	7	129	20.25					$2,610				$2,610
C		- Fans	0.4	tn	7	6	20.25					$120				$120
C		- HEPA Filters	0.7	tn	7	10	20.25					$200				$200
C		- Chillers	4	tn	7	56	20.25					$1,130				$1,130
C		- Condensate Pumps	0.4	tn	7	6	20.25					$120				$120
C		- Holdup Tank	2	tn	7	28	20.25					$570				$570
C		- Transfer Pump	0.6	tn	7	8	20.25					$160				$160
D		Metal Platform	1	tn	7	10	20.25					$200				$200
D		Ext. Metal Ladder	0.2	tn	7	2	20.25					$40				$40
C	C	Ductwork - HVAC - 6"	400	lf	0.127	102	20.25					$2,070				$2,070
C		- Stack - 24"	150	lf	0.151	45	20.25					$910				$910
C		- Climate Control Unit Htrs	0.6	tn	7	8	20.25					$160				$160
C	D	Electrical - MCC	0.4	tn	7	6	20.25					$120				$120
C		- Local Load Cntr	0.1	tn	7	1	20.25					$20				$20
C		- 480 V SWGR	0.3	tn	7	4	20.25					$80				$80
C		- Lighting	0.1	tn	7	1	20.25					$20				$20
C		- Alarms	0.1	tn	7	1	20.25					$20				$20
C		- Rad Detectors	0.1	tn	7	1	20.25					$20				$20
C		Conduit (small)	500	lf	0.021	21	20.25					$430				$430
C		Cable Trays	100	lf	0.033	7	20.25					$140				$140
		Take-off Allowance			10%	114						$2,300				$2,300
		Subtotal Direct Cost	1	LOT	125	1,022						$25,300				$25,300

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II, & III con't.														
C	E Piping - 4" avg	600	lf	0.053	64	20.25					$1,300				$1,300
D	Concrete Slab @ Grade @1'	111	cy	0.459	70	20.25					$1,420				$1,420
D	Concrete Slab Elevated @ 1'	50	cy	3.603	248	20.25					$5,020				$5,020
D	Coated Concrete Walls 2"	37	cy	0.400	20	20.25					$410				$410
D	Footers	90	cy	0.368	45	20.25					$910				$910
	Take-off Allowance			10%	45						$910				$910
	Subtotal Direct Cost	1	LOT		492	20.33					$10,000				$10,000

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III	Silo Waste Retrieval System															
D	A	Pivoting Bridge	11	tn	7	106	20.25					$2,150				$2,150
D	B	Center Foundation	26	cy	0.400	14	20.25					$280				$280
D	C	Curved Plate Foundations	67	cy	0.400	37	20.25					$750				$750
D	D	Structural Truss & Tower	11	tn	7	106	20.25					$2,150				$2,150
D		Tower #2	2	tn	10	28	20.25					$570				$570
D		Curved Plate for Glide Track	12	tn	7	116	20.25					$2,350				$2,350
	E	Retrieval Equipt & Housing:					20.25									
C		• Sluicer Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		• Deployment Equipment	3	tn	40	241	20.25					$4,880				$4,880
C		• Retrieval Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		• Discrete Object Housing	1.5	tn	40	120	20.25					$2,430				$2,430
C		• CATS Housing	1	tn	7	14	20.25					$280				$280
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
C		Piping	700	lf	0.053	74	20.25					$1,500				$1,500
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		Pipe Bridge @35'h w/ 40' spans conc ftg	15	tn	7	145	20.25					$2,940				$2,940
C		RCS Round Duct	600	lf	0.127	153	20.25					$3,100				$3,100
C	F	Transfer Line (Silo to TTA) - 2"	300	lf	0.040	24	20.25					$490				$490
C	G	Air Equipt (for Air Track) - 2"	500	lf	0.040	40	20.25					$810				$810
C		Air Compressor	0.2	tn	7	3	20.25					$60				$60
C	H	Water Supply System 2"	500	lf	0.040	40	20.25					$810				$810
C		Hydraulic Line 2"	200	lf	0.040	16	20.25					$320				$320
D		Conduits	900	lf	0.033	41	20.25					$830				$830
		Take-off Allowance			10%	171						$3,460				$3,460
		Subtotal Direct Costs	1	LOTS		1,881	20.26					$38,100				$38,100

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III	Silo Waste Retrieval System con't.															
D	I	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
D	J	Trailers - Decon	6	tn	7	58	20.25					$1,170				$1,170
D		- Storage	6	tn	7	58	20.25					$1,170				$1,170
D		- Office	6	tn	7	58	20.25					$1,170				$1,170
D		- Break	6	tn	7	58	20.25					$1,170				$1,170
D	L	Camera System	0.4	tn	7	4	20.25					$80				$80
		Take-off Allowance			10%	29						$590				$590
		Subtotal Direct Cost		LOT		323	20.12					$6,500				$6,500

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
IV	Transfer Tank Area															
C	A	Storage Tanks 66'dia x 30'h	220	tn	2.700	1191	20.25					$24,120				$24,120
C	B	Decant Tank 38'dia x 30'h	34.2	tn	2.700	185	20.25					$3,750				$3,750
D	C	Structure w/Metal Roof	112.5	tn	2.700	418	20.25					$8,460				$8,460
D		w/ 12" concrete Floor	833	cy	0.459	527	20.25					$10,670				$10,670
D		w/ 2' concrete Walls	1600	cy	0.400	882	20.25					$17,860				$17,860
D		w/ 9" R/I conc Slab - Operating Deck (Par	625	cy	0.459	395	20.25					$8,000				$8,000
D		Concrete footers	266	cy	0.366	134	20.25					$2,710				$2,710
D	D	Sampling System Enclosure @2' thick	104	cy	0.400	57	20.25					$1,150				$1,150
D		Slurry Sample & Storage Bldg (3 Walls &	55	cy	0.400	30	20.25					$610				$610
D	E	Raw Water Tank	3.2	tn	3	12	20.25					$240				$240
	F	Mechanical Systems - Pumps														
C		- TTA Transfer	0.4	tn	7	6	20.25					$120				$120
C		- Makeup Water	0.1	tn	7	1	20.25					$20				$20
C		- Sump	0.1	tn	7	1	20.25					$20				$20
C		- Sluice	0.1	tn	7	1	20.25					$20				$20
C		- HPU Pump	0.1	tn	7	1	20.25					$20				$20
C		- Piping	750	lf	0.053	80	20.25					$1,620				$1,620
D	G	Electrical - MCC #2	3	cy	0.459	2	20.25					$40				$40
D	H	Lighting , Conduit	2000	lf	0.033	91	20.25					$1,840				$1,840
D		Cable Tray	500	lf	0.021	14	20.25					$280				$280
D	J	Heat (personal) Unit Htrs	0.4	tn	7	4	20.25					$80				$80
C	K	Ductwork	300	lf	0.127	76	20.25					$1,540				$1,540
C	M	Decant Sump	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	411						$8,320				$8,320
		Subtotal Direct Cost				4,520	20.24					$91,500				$91,500

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C.2.6 Project Management Estimate Basis: Vitrification — Joule-heated

C.2.6.1 Introduction

The project management cost estimate is summarized in **Table C.2.6-1**.

The project management cost for the Vitrification – Joule-heated alternative was prepared as detailed estimates based on Silos Project FY98 actuals and the current Silos Project organizational charts.

TABLE C. 2.6-1
TOTAL PROJECT MANAGEMENT COST

Annual FDF Project Management Cost	$2,115,160
Silos 1 and 2 Remediation Schedule Duration	10.5 years
Total Project Management Cost	$22,145,800

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C.2.6.2 Estimate Basis

The cost estimate basis for the project management cost of the Vitrification — Joule-heated alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.2.6.2.1 Assumptions

The following general assumptions were used in the preparation of the project management estimates:

1. Costs are expressed in FY99 dollars.
2. FDF project management labor is based on the current Silos Project organizational structure.
3. Throughout the project, FDF project management labor is 100% dedicated in support of the Silos 1 and 2 material full-scale remediation project.
4. Labor cost is based on a 40-hr/week schedule.
5. FDF project management for the Silos 1 and 2 material full-scale remediation project is level-of-effort support throughout the project duration from FY00 thru FY10.

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C.2.6.2.2 Inclusions

The project management cost estimate includes the following cost elements:

- Project management labor; and
- Project management office supplies.

C.2.6.2.3 Exclusions

The following elements of cost are excluded from the project management cost estimate:

- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc.);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation O&M cost; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.2.6.2.4 Format and Coding

The project management cost estimates are compiled and summarized into the following cost centers:

- FDF labor; and
- Material.

The following discussion provides a brief description of the cost centers.

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

Material Cost

Material cost is the cost for office supplies.

C.2.6.2.5 Methodology

The following methods were used to prepare the project management cost estimate:

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using Silos Project FY98 actuals and the current Silos Project organizational structure. The FY99 plan labor rates were then applied to the labor resources to obtain the FDF project management labor cost estimate.

Material Cost

The material cost estimate is based on the Silos Project FY98 project management actual material cost.

C.2.6.2.6 References

The following references were used to prepare the project management cost estimate:

- Silos Project Organization Charts, dated July 23, 1999; and
- FY98 12-month spread for control account 4PM1A, "Project Management" from the FEMP project control system.

C.2.6.2.7 Attachment

The detailed project management cost summary for the Vitrification — Joule-heated (VIT1) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.2.6.I

Project Management Cost Estimate Summary for

Vitrification — Joule-heated

DETAIL ESTIMA.. WORKSHEETS

PROJECT: Joule Heated (Vit 2)
ESTIMATE NO.:
CLIENT: DOE
WBS NO.:

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
23	PROJECT MANAGEMENT														
	Project Manager	1	ea	21,840	21840	100.00					2,184,000				$2,184,000
	Adminstration Assistand	2	ea	21,840	43680	49.00					2,140,320				$2,140,320
	Contract Adminstrator	1	ea	21,840	21840	43.00					939,120				$939,120
	Contract Technical Represent	1	ea	21,840	21840	49.00					1,070,160				$1,070,160
	Site Integration	1	ea	21,840	21840	49.00					1,070,160				$1,070,160
	Environmental Compliance	1	ea	21,840	21840	45.00					982,800				$982,800
	Clerical	2	ea	21,840	43680	23.00					1,004,640				$1,004,640
	Quality Manager	1	ea	21,840	21840	60.00					1,310,400				$1,310,400
	Quality Engineer	2	ea	21,840	43680	44.00					1,921,920				$1,921,920
	Project Controls Manager	1	ea	21,840	21840	60.00					1,310,400				$1,310,400
	Project Controls Scheduler	1	ea	21,840	21840	42.00					917,280				$917,280
	Project Controls Cost	1	ea	21,840	21840	42.00					917,280				$917,280
	Project Engineering Manager	1	ea	21,840	21840	60.00					1,310,400				$1,310,400
	Project Engineers	2	ea	21,840	43680	54.50					2,380,560				$2,380,560
	Readiness Coordinator	1	ea	21,840	21840	42.50					928,200				$928,200
	Training Coordinator	1	ea	21,840	21840	42.50					928,200				$928,200
	Material Cost	1	lot						830,000				830,000		$830,000
	Take-off Allowance														
	Total Cost ITEM NO. 23	1	LOT		436,800	5.48180					21,315,800		830,000		$22,145,800

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C.2.7 Waste Disposal Cost Estimate

C.2.7.1 Introduction

The waste disposal costs for the Vitrification — Joule-heated (VIT1) alternative are summarized in **Table C.2.7-1**.

TABLE C. 2.7-1
WASTE DISPOSAL COST
VITRIFICATION — JOULE-HEATED

Waste Disposal Containers Cost	$16,299,450
Transportation Cost	$ 5,035,800
NTS Burial Cost	$ 2,356,035
Risk Budget	$840,820
Total Waste Disposal Cost Estimate	$24,532,105

The waste disposal cost estimate for the Vitrification — Joule-heated (VIT1) alternative was prepared based on the waste loading assumptions documented in **the Basis of Design and Description (Appendix G)**, quotes for containers and transportation services, and FY99 NTS volumetric burial fees.

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C.2.7.2 Estimate Basis

The cost estimate basis for the waste disposal cost of the Vitrification — Joule-heated (VIT1) alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.2.7.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY99 dollars.
2. The wasteform produced by the Vitrification — Joule-heated process is a monolith with 2% air pockets.
3. Waste loading of the glass is 90 weight percent (wt%).
4. Mode of transportation to the NTS is via truck.
5. Truckload capacity is 42,000 lb.
6. The wasteform produced by the Vitrification — Joule-heated process has 1% out of specification glass, requiring rework.
7. The treated Silos 1 and 2 material is disposed of at the NTS.
8. The treated Silos 1 and 2 material meets the NTS WAC.
9. The vitrified glass monolith is cast into a monolith transfer container (MTC) for material handling.
10. Four MTCs are placed into a shipping/disposal container.

C.2.7.2.2 Inclusions

The waste disposal cost estimate includes the cost of the following elements:

- Shipping containers;
- MTCs;
- Shipment of the treated waste via truck to the NTS; and
- Disposal at the NTS.

C.2.7.2.3 Exclusions

The waste disposal cost estimate excludes the following elements:

- Silo 1 and 2 full-scale treatment facility capital cost;
- D&D cost;
- Disposal cost of D&D debris;
- Cost of operation of AWWT and other site support functions (security, fire department, etc.);
- Silos 1 and 2 material full-scale treatment facility O&M cost; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.2.7.2.4 Format and Coding

The waste disposal cost estimate is compiled and summarized into the following cost centers:

- Waste disposal container;
- MTC;
- Shipping/disposal container;
- Transportation;
- NTS burial; and
- Risk budget.

C.2.7.2.4.1 Waste Disposal Container Cost

Container costs are the costs for shipping containers and MTCs.

C.2.7.2.4.2 Transportation Cost

Transportation cost is FDF's cost for transporting the treated Silos 1 and 2 material to the NTS.

C.2.7.2.4.3 NTS Burial Cost

Burial costs are the costs for the burial and management of waste disposed at the NTS.

C.2.7.2.4.4 Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the waste loading, packaging and transportation.

C.2.7.2.5 Methodology

The methods used to prepare the waste disposal cost estimate are discussed next.

Waste Disposal Container Cost

The shipping container cost estimate is based on quotes for using a Scientific Ecology Group, Inc. (SEG) design, high density, concrete with steel fiber. This container does not have the same dimensions as the certified SEG container; but, its cost is assured to be close to the cost of the SEG container because it's similar in design and materials of construction. The cost of the MTCs is based on a vendor quote.

Table C.2.7-2 presents a summary of the containers required to dispose the treated Silos 1 and 2 material at the NTS.

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TABLE C. 2.7-2
WASTE DISPOSAL CONTAINER SUMMARY

Container	Quantity	Unit Cost	Total Cost
MTCs	12,586	$290 ea	$3,650,000
Shipping/disposal	2,398	$5,275 ea	$12,649,450

Transportation Cost

A total of 1,199 truck shipments is required to transport the treated Silos 1 and 2 material to the NTS. The transportation cost estimate is based on FY99 average shipping costs, via truck, to the NTS. The transportation cost estimate is $4,200 per truck shipment.

NTS Burial Cost

The burial cost estimate is based on the FY99 burial rate negotiated between the FEMP and the NTS. The burial cost estimate is based on a volumetric rate of $7.50 per cubic feet of material disposed.

Risk Budget

The risk budget was calculated based on the potential risks associated with waste loading, shipping and waste disposal. The risk factor was determined by the FDF team based on historical data and professional judgement and documented in meeting minutes (see **Table C.2.4-9**).

C.2.7.2.6 References

- **Basis of Design and Description (Appendix G)**
- *POP Final Report* **(Appendix H, Attachment H1)**

C.2.7.2.7 Attachments

Detailed waste disposal cost summaries for the Vitrification — Joule-heated (VIT1) alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.2.7.I

Waste Disposal Cost Estimate Summary for

Vitrification — Joule-heated

DETAIL ESTIMATE WORKSHEETS

PROJECT: C4981003
ESTIMATE NO.: Silos 1 & 2 Joule Heated Vitrify (FS)
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 18-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Waste Disposal	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
22	WASTE DISPOSAL	2398	ea	1.00					5,275				12,649,450		$12,649,450
22	TRANSPORTATION	2398	ea	1.00				2,100				5,035,800			$5,035,800
31	NTS BURIAL FEE	2398	ea	1.00				982.50				2,356,040			$2,356,040
22	Monolith Trans. Container	1	ea	1.00					3650000				3,650,000		$3,650,000

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VITRIFICATION - Joule
WASTE DISPOSAL

ITEM	BASIS		AMOUNT	
NO. OF MTC		12600		
MTC COST		290	$	3,650,000.00
NO. OF CONTAINER		2398		
CONTAINER COST		5275	$	12,649,450.00
TRANSPORTATION	$2100 EACH		$	5,035,800.00
DISPOSAL	131 CU. FT. EACH @ $7.50/CU. FT.		$	2,356,035.00
TOTAL			$	23,691,285.00

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C.2.8 Cost of Money Estimate

C.2.8.1 Cost of Money Analysis

Cost of money is the cost incurred by the Silos 1 and 2 material full-scale remediation contractor to finance the engineering cost, start-up cost, and capital cost. This cost assumes that the contract for the Silos 1 and 2 material full-scale remediation project will be structured similar to the Silo 3 project contract, which shifts financial liability and risk of the project to the contractor. Thus, the contract requires the contractor to finance engineering, capital, and start-up costs and be reimbursed on a predetermined, pay-item schedule once operations are successful.

The cost of money in **Table C.2.8-1** was calculated by establishing a contractor's cash output and cash input schedule and applying a finance rate of 8%. The Silos 1 and 2 project remediation schedule in **Figure 3.2-3** was used as the basis for activity durations.

TABLE C. 2.8-1
COST OF MONEY FOR
VITRIFICATION — JOULE-HEATED

Cost of Money	$45,574,610

C.2.8.2 Attachment

The cost of money analysis summary for the Vitrification — Joule-heated (VIT1) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.2.8.I

Cost of Money Estimate for

Vitrification – Joule-heated

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FLUOR DANIEL FERNALD
FULL SCALE REMEDIATION
COST OF MONEY MODEL
SILO 1 & 2 JOULE VITRIFICATION F/S
SUBCONTRACTOR "PAY OUT" SCHEDULE

Pay Item Number	Description	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 Dollars)	$25,728,900	$8,576,300	$8,576,300	$8,576,300						
	TOTAL 1.0 (in ESCALATED Dollars)	$28,702,087	$9,299,762	$9,562,063	$9,840,261	$0	$0	$0	$0	$0	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 Dollars)	$65,228,413			$32,614,207	$32,614,207					
	TOTAL 2.0 (in ESCALATED Dollars)	$75,899,612	$0	$0	$37,420,836	$38,478,776	$0	$0	$0	$0	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 Dollars)	$2,109,000				$2,109,000					
	TOTAL 3.0 (in ESCALATED Dollars)	$2,488,233	$0	$0	$0	$2,488,233	$0	$0	$0	$0	$0
4.0	PRE-OPERATIONAL ASSESSMENT										
	TOTAL 4.0 (in 99 Dollars)										
	TOTAL 4.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 Dollars)	$57,654,380					$14,413,595	$19,218,127	$19,218,127	$4,804,531	
	TOTAL 5.0 (in ESCALATED Dollars)	$72,567,933	$0	$0	$0	$0	$17,499,661	$24,009,713	$24,704,356	$6,354,203	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Dollars)										
	TOTAL 6.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Dollars)	$26,320,100								$11,664,550	$11,664,550
	TOTAL 7.0 (in ESCALATED Dollars)	$31,296,991	$0	$0	$0	$0	$0	$0	$0	$15,426,876	$15,870,115
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Dollars)										
	TOTAL 8.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN 99 DOLLARS	$174,049,793	$8,576,300	$8,576,300	$41,190,506	$34,723,207	$14,413,595	$19,218,127	$19,218,127	$16,469,082	$11,664,550
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN ESCALATED DOLLARS	$210,954,855	$9,299,762	$9,562,063	$47,261,097	$40,967,008	$17,499,661	$24,009,713	$24,704,356	$21,781,079	$15,870,115
			$8,576,300	$17,152,600	$58,343,106	$93,066,313	$107,479,908	$126,698,035	$145,916,161	$162,385,243	$174,049,793

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SUBCONTRACTOR "PAY IN" SCHEDULE

Pay Item Number	Description	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 Dollars)	$25,728,900						$6,432,225	$6,432,225	$12,864,450	
	TOTAL 1.0 (in ESCALATED Dollars)	$33,318,187	$0	$0	$0	$0	$0	$8,035,949	$8,268,443	$17,013,796	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 Dollars)	$65,228,413						$16,307,103	$16,307,103	$32,614,207	
	TOTAL 2.0 (in ESCALATED Dollars)	$84,468,923	$0	$0	$0	$0	$0	$20,372,895	$20,962,318	$43,133,710	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 Dollars)	$2,109,000						$527,250	$527,250	$1,054,500	
	TOTAL 3.0 (in ESCALATED Dollars)	$2,731,094	$0	$0	$0	$0	$0	$658,707	$677,765	$1,394,622	$0
4.0	PRE-OPERATIONAL ASSESSMENT										
	TOTAL 4.0 (in 99 Dollars)										
	TOTAL 4.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 Dollars)	$57,654,380						$14,413,595	$14,413,595	$28,827,190	
	TOTAL 5.0 (in ESCALATED Dollars)	$74,660,767	$0	$0	$0	$0	$0	$18,007,285	$18,528,267	$38,125,216	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Dollars)										
	TOTAL 6.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Dollars)	$23,929,100								$11,664,550	$11,664,550
	TOTAL 7.0 (in ESCALATED Dollars)	$31,296,991	$0	$0	$0	$0	$0	$0	$0	$15,426,876	$15,870,115
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Dollars)										
	TOTAL 8.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL FOR "PAY IN" FOR PAY ITEMS IN 99 DOLLARS	$174,049,793	$0	$0	$0	$0	$0	$37,680,173	$37,680,173	$87,024,897	$11,664,550
	TOTAL FOR "PAY IN" FOR PAY ITEMS IN ESCALATED DOLLARS	$226,475,963	$0	$0	$0	$0	$0	$47,074,835	$48,436,793	$115,094,220	$15,870,115
			$0	$0	$0	$0	$0	$37,680,173	$75,360,347	$162,385,243	$174,049,793

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COST OF MONEY CALCULATION	COST OF MONEY RATE/YR	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
MONTHLY "PAY OUT" AMOUNTS	Prime Rate 8/4/99	$8,576,300	$8,576,300	$41,190,506	$34,723,207	$14,413,595	$19,218,127	$19,218,127	$16,469,082	$11,664,550
PLUS - YEARLY COST OF MONEY INCREME	8.00%	0	$686,104	$1,427,096	$4,836,505	$8,001,281	$9,794,472	$9,101,066	$8,352,187	$3,375,897
LESS - YEARLY "PAY IN" AMOUNTS		$0	$0	$0	$0	$0	$37,680,173	$37,680,173	$87,024,897	$11,664,550
OUTSTANDING YEARLY INCREMENTAL VALUES		$8,576,300	$9,262,404	$42,617,603	$39,559,711	$22,414,876	($8,667,575)	($9,360,981)	($62,203,628)	$3,375,897
OUTSTANDING CUMULATIVE VALUES		$8,576,300	$17,838,704	$60,456,307	$100,016,018	$122,430,894	$113,763,319	$104,402,338	$42,198,710	$45,574,607
CUMULATIVE COST OF MONEY FY99	$ 45,574,607	$0	$686,104	$2,113,200	$6,949,705	$14,950,986	$24,745,458	$33,846,523	$42,198,710	$45,574,607
CUMULATIVE COST OF MONEY	$ 132,188,169									

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C.3.0 VITRIFICATION — OTHER

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C.3.1 Cost Estimate Summary: Vitrification — Other

C.3.1.1 Introduction

The summary cost for the Vitrification — Other (VIT2) alternative is $342,678,551 in FY99 dollars, as shown in **Table C.3.1-1**.

TABLE C. 3.1-1
SUMMARY COST ESTIMATE FOR VITRIFICATION — OTHER

Section	Cost Element	Estimated Cost
C.3.2	Capital Cost	$66,905,043
C.3.3	Engineering Cost	$25,050,900
C.3.4	O&M	$133,120,500
C.3.5	D&D Cost	$38,232,830
C.3.6	Project Management Cost	$22,145,800
C.3.7	Waste Disposal Cost	$20,097,980
C.3.8	Cost of Money	$37,125,498
C.3.1	Summary Cost (Un-escalated)	$342,678,551

Supporting information for the Vitrification — Other cost estimate elements are provided in **Sections C.3.2** through **C.3.8**.

C.3.1.2 Attachment

The cost estimate summary for the Vitrification — Other (VIT2) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.3.1.I

Cost Estimate Summary for

Vitrification — Other

CONTROL ES. ATE SUMMARY

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 30-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	RISK	LABOR	S/C	MAT'L	EQUIP	TOTAL		
1	PRE-MOBILIZATION - CONTRACTOR	1	LOT								678,000				$678,000	C	% / X
2	CAPITAL Direct/ Indirect Field Cost	1	LS								14,928,793	9,155,700	8,802,850	17,093,600	$49,980,943	C	
3	CONSTRUCTION Management	1	LS								4,478,600				$4,478,600	F	
4	ENGINEERING	1	LS									25,050,900			$25,050,900	C	
5	RISK BUDGET for capital 14.8%	1	LS							11,767,500					$11,767,500	C	
6	DECONTAMINATION/ DEMOLITION	1	LS									14,946,700			$14,946,700	C	
7	TTA/ RCS (Case B) - D & D	1	LS									10,575,500			$10,575,500	C	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
	SUB-TOTAL - ALL PAY ITEMS	1	LS							11,767,500	20,085,393	59,728,800	8,802,850	17,093,600	$117,478,143		
21	Labor FDF - Operations	4.0	YR								77,983,360				$77,983,360	F	
22	Waste Disposal (PKG & Transport)	2,162	CNT									4,540,200	11,404,550		$15,944,750	F	
22a	Secondary Waste to OTHER	1	LS									204,760			$204,760	C	
23	Project Management FDF	1	LOT								21,315,800		830,000		$22,145,800	F	
	SUB-TOTAL - FDF SUPPORT ITEMS	1	LS								99,299,160	4,744,960	12,234,550		$116,278,670		
24	Start-up testing	6	Mths									1,154,330			$1,154,330	C	
25	UTILITY	4.0	YR										4,046,270		$4,046,270	C	
26	SPARE PARTS	4.0	YR										1,213,600		$1,213,600	C	
27	HEALTH PHYSICS	4.0	YR								964,700		3,255,300		$4,220,000	C/F	
28	CONSUMABLE	4.0	YR										5,370,110		$5,370,110	C	
29	Subcontractor Oversight (ops & Maint)	1.6	YR									2,159,810			$2,159,810	C	
30	RISK BUDGET 30.0%	1	LS							36,220,046					$36,220,046	C	
	SUB-TOTAL - OPERATION/ MAINT ITEMS	1	LS							36,220,046	964,700	3,314,140	13,885,280		$54,384,170		
	TOTAL CONTRACTOR COSTS OF MONEY											37,125,498			$37,125,498		
	TOTAL CONTRACTOR COSTS - FY99 $'s									47,987,546	120,349,253	104,913,400	34,922,680	17,093,600	$325,266,480		
31	NTS DISPOSAL FEE w/ 5% risk	1	LS							829,150		16,582,916			$17,412,066	D	
	TOTAL PROJECT COST	1	LOT							48,816,696	120,349,253	121,496,316	34,922,680	17,093,600	$342,678,500		

C: CONTRACTOR F: FLUOR DANIEL FERNALD G: GCBCTC LABOR D: DOE %: PERCENTAGE of VARIABLE TOTALS T: TIME DEPENDANT V: VOLUME DEPENDANT O: OPERATING EFFIC. APPLIED W: WEIGHT X: FIXED COST

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C.3.2 Capital Cost Estimate Basis: Vitrification — Other

C.3.2.1 Introduction

The capital cost estimate for the Vitrification — Other (VIT2) alternative is summarized in **Table C.3.2-1**.

The capital costs of the VIT2 alternative were prepared as detailed estimates based on the equipment lists, process and mechanical equipment data sheets, single-line electrical diagrams, architectural sketches, and the plot plan provided in the **Design Basis and Description (Appendix G)** for this alternative.

<END OF PAGE>

TABLE C. 3.2-1
CAPITAL COST ESTIMATE FOR VITRIFICATION — OTHER

Section	Cost Element	Estimated Cost
C.3.2.2.4.1	Pre-Mobilization	$ 678,000
C.3.2.2.4.2	DFC	$ 30,256,643
C.3.2.2.4.3	IFC	$ 19,724,300
C.3.2.2.4.4	Construction Management	$ 4,478,600
C.3.2.2.4.5	Risk Budget	$ 11,767,500
C.3.2.1	Total Capital Cost	$ 66,905,043

C.3.2.2 Estimate Basis

The cost estimate basis for the capital cost of the Vitrification — Other alternative is comprised of the following six sections (**C.3.2.2.1** through **C.3.2.2.6**):

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.3.2.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in the second quarter, 1999 U.S. dollars.
2. Labor costs are based on a 4-day/week, 10-hr/day, 40-hr work week with an adequate supply of skilled labor available in the area.
3. Mission changes or major rework does not occur during the engineering, procurement, and construction phases of the project.
4. Machinery, equipment, and bulk materials are purchased in the U.S.

5. Engineered machinery and equipment pricing is obtained from engineering specialists and includes freight to the jobsite.
6. Bulk material pricing is estimated using in-house material pricing data.
7. A site productivity multiplier of 1.186 is applied to estimated installation mhr.
8. A sales tax of 6% is applied to estimated equipment and material dollars.
9. Freight is estimated at 2.5% of equipment and material dollars.

C.3.2.2.2 Inclusions

The capital cost estimate includes the costs of the Vitrification — Other equipment, process equipment, utility equipment, and the associated buildings and structures.

C.3.2.2.3 Exclusions

The following elements of cost are excluded from the capital cost estimate:

- Silos 1 and 2 material retrieval;
- Silo 3 material retrieval and remediation;
- Capital, start-up, and operating spare parts;
- Start-up costs;
- Expense funded costs;
- Operating costs; and
- D&D costs.

C.3.2.2.4 Format and Coding

The VIT2 capital cost estimate is compiled and summarized into the following cost centers:

- Pre-mobilization;
- Direct field;
- Indirect field;
- Construction management;
- Risk budget; and
- Contingency.

The following discussion provides a brief description of the cost centers.

C.3.2.2.4.1 Pre-mobilization Costs

Pre-mobilization costs are the costs for development and issuance of project documentation and planning.

C.3.2.2.4.2 Direct Field Costs

DFC are the costs for direct construction of the Vitrification — Other full-scale treatment facility. These costs include craft labor, bulk materials, machinery, and equipment. The FS estimates are further summarized into the following primary, DFC code accounts:

A/C 0 – Excavation and Civil Works
A/C 1 – Concrete
A/C 2 – Structural Steel
A/C 3 – Architectural
A/C 4 – Machinery and Equipment
A/C 5 – Piping
A/C 6 – Electrical
A/C 7 – Instrumentation and Control Systems
A/C 8 – Paint and Insulation
A/C AA – Mobilization

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The DFCs for the machinery, equipment, and electrical power distribution accounts are broken down into the following systems:

15 – Feed Preparation
17 – Processor
18 – Process Off-gas
20 – Radon Control
23 – Product Forming and Handling
25 – Container Receipt and Handling
26 – Product Recycle
30 – High Voltage
31 – 480 V Distribution
32 – Standby Power
33 – UPS
40 – Plant and Instrument Air
41 – Breathing Air
44 – Product Additive
50 – Process Water
51 – Portable Water
52 – Fire Water
53 – Cooling Water
61 – Non-Radioactive Waste
63 – Laboratory Waste
64 – Radioactive Waste
73 – Waste Processing Building HVAC
75 – Analytical Laboratory HVAC
76 – Maintenance and Warehouse Facilities HVAC
77 – Miscellaneous Facilities HVAC
80 – Maintenance Equipment
82 – Remote Handling Equipment
83 – RAD Shielding Equipment
84 – Sampling
85 – CCTV
93 – Health Protection
94 – Analytical Laboratory

C.3.2.2.4.3 Indirect Field Costs

IFC are the costs for direct construction effort. These costs include the following:

- Construction supervision;
- Small tools and consumable supplies;
- Construction equipment rental;
- Temporary construction facilities;
- Temporary utilities;
- Job clean-up;
- Safety training;
- Health physics;
- CERCLA;
- GET/Site access & job specific training;
- Payroll burdens and benefits;
- Overhead and profit;
- Bond; and
- Sales tax.

C.3.2.2.4.4 Construction Management Costs

Construction management costs are costs for construction activities that occur at the FEMP. These costs include construction management labor costs for managing and coordinating the construction activities at the FEMP, and the costs for hooking up and supporting construction temporary trailers, supplies and utilities.

C.3.2.2.4.5 Risk Budget

Allowance for risks and uncertainties associated with the construction of the plant.

C.3.2.2.5 Methodology

The following assumptions, MTO allowances, and methods are used to prepare the capital cost estimate:

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Premobilization

The premobilization costs are activity-based level-of-effort support estimates.

Direct Field Costs

Civil Work

Neat quantities are taken off; a slope of 1.8 to 1 is assumed in all excavation 5'0" below-grade, and a 15% swell factor is used to backfill quantities. Since excavated soils are assumed suitable for backfill, imported backfill material is not included. A disposal site is assumed to be located within one-half mile from the construction site.

Concrete

Neat quantities are taken off and rounded to the nearest ten yards. Fluor standard all-in unit rates per CY are applied to the MTO quantities. The all-in rates include the price of concrete, formwork, reinforcing steel, and embedded accessories. Concrete material pricing is developed from current in-house information.

Structural Steel

Steel quantities are taken off and rounded to the nearest ton. A MTO allowance ranging from 5 to 10 percent is applied:

Light-	Qty + 10%
Medium-	Qty + 7.5%
Heavy-	Qty + 5%
Siding/Decking	Qty + 10%

Steel material pricing is developed from current in-house information.

Architectural

Architectural quantities are developed from the building plan and elevation drawings, and rounded. Unit rates of installation are developed for the various architectural construction tasks. Material pricing is developed from the current in-house information. Various MTO allowances ranging from 1 to 10% are applied to quantities, depending on the type of architectural material.

The estimate contains the following buildings:

Waste Process Building	51,500 SF
Analytical Laboratoy	3,024 SF

Warehouse	9,600 SF
Mechanical/Electrical Building	5,100 SF
Control Room	720 SF
Additive Bin Storage Facility	3,006 SF
On-site Storage Building	5,480 SF

HVAC Ductwork

Ductwork is estimated by lb/ft^2 of building area. All ductwork related items are estimated at a percentage of the ductwork cost:

Description	Installation mhr	Material
duct	lb x .057 mhr/lb	$2.14
dampers	15% duct mhr	15% duct matl$
accessories	7% duct mhr	7% duct matl$
supports	20% duct mhr	20% duct matl$
insulation	17% duct mhr	17% duct matl$
test and balance	25% duct mhr	N/A

HVAC equipment is included in the machinery and equipment A/C estimate.

Machinery and Equipment

The machinery and equipment pricing is developed by Engineering from informal vendor quotes and in-house pricing. The pricing includes freight to the jobsite. The equipment installation rates are developed from in-house data, or crew size, duration estimates. The installation mhrs include the setting and testing of the equipment. Routine maintenance is included in the installation rates on an annual basis.

Piping

The piping estimate is developed using two methods: MTO and factoring.

Take-off allowances are made for the following systems:

- Contaminated water (double encased line from the sumps to its tank).
- Potentially contaminated water (line from the sumps to its tank).
- Fire water loop, hydrants, and branches to the buildings.
- New stormwater system line involving the relocation of an existing line, and the installation of new HDPE.
- Feed lines to the additive storage bins.

Allowances for pipe valves are developed as follows:

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- Pumps are assigned 3 ea. – ½" gate (drain) valves.
- Tanks are assigned 2 ea. – 2", 2 ea. - ¾" and 1 ea. – ½" gate (gauge & drain) valve.

Piping costs were factored for the remaining process and utility systems, based on the equipment costs. The factors are based on prior estimates of similar waste processing facilities.

Electrical

The electrical estimate is developed using both a MTO approach and factoring.

Take-offs for power distribution are prepared by the process/utility system based on the power load requirements shown in the equipment list and one-line diagrams. A factored approached is taken to develop the remaining electrical bulk wiring for the non-process instruments connect to the DCS, and additional melter wiring requirements. The factors are based on similar waste processing facility estimates. Building lighting and communications estimates are derived on a cost per square feet basis. Area lighting for the plot and building grounding is taken off based on the current plot plans.

Instrumentation

The instrumentation estimate is developed using a combination of take-off and factoring methods. Engineering provides a priced process system instrument list. Conceptual process diagrams are used as a basis to take off the local instrumentation. An allowance for isokinetic monitoring is added for the off-gas and the HVAC stacks. Leak detection is added for the double encased contaminated water lines. An allowance for HVAC controls is added based on the HVAC equipment list. The remaining instrument for the utility systems is factored in lieu of instrument diagrams. The factors are developed based on similar waste processing facility estimates.

Paint

The painting estimate is derived using take-off, allowances, and factoring methods. A MTO approach is used to calculate paint requirements for architectural drywall, doors, concrete floors, wall and ceilings, and tanks and stacks. Paint for pricing is factored with the pipe from the equipment account.

Insulation

The insulation estimate is developed using a take-off approach for architectural insulation, and a factored approach for piping and HVAC duct work requirements.

Indirect Field Costs

Construction Supervision

This element of cost includes the following contractor support staff:

- General Superintendent,
- Superintendent,
- Assistant Superintendent,
- Office Administrator,
- Labor Relations,
- Job Coordinator,
- Safety Engineer,
- Field Office and Material Manager,
- Time and Material Supervisor,
- Chief Timekeeper,
- Field Project Accountant,
- Cost Estimator,
- Civil Engineer,
- Construction Warehouseman,
- Time Keeper,
- Material Man, and
- Construction Accounting Clerk.

Construction supervision is estimated at 17% of direct field labor dollars.

Small Tools and Consumables

The cost of small tools and consumables is estimated at 6% of direct field labor dollars and provides for items valued at $500 or less.

Equipment Rental

This cost includes smaller light construction equipment used during the construction phase of the project. This cost excludes large cranes which are specifically defined on the construction estimate. Equipment rental is estimated at $3.50 per direct field labor mhrs.

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Temporary Facilities

This cost includes temporary buildings/sheds/trailers and warehouses used during construction. It is estimated at 6% of direct field labor dollars (split 50% to indirect labor, 50% to indirect material).

Job Clean-up

Includes housekeeping of site/work areas to maintain a safe, clean work environment. Clean up is estimated at 6% of direct field labor dollars (split 75% to indirect labor, 25% to indirect material).

Safety

This cost includes expenses for contractor joist safety meetings and supplies. Safety is estimated at 3% of direct field labor dollars (split 65% to indirect field labor, and 35% to indirect field material).

Health Physics

This cost includes RAD checks, workers' physicals, participation in drug screening, and material costs associated with PPE. Health physicals are estimated on a cost per FTE manpower basis.

CERCLA/SAT

This cost includes the costs for site access and RAD training. It is estimated on a cost per FTE basis.

Payroll Burdens and Benefits

This cost includes FICA payments, FUI, SUI, union benefits, and disability. Payroll burdens and benefits are calculated at 57% of the sum of direct and indirect field (labor dollars).

Overhead and Profit

This cost includes the contractor's overhead and profit. It is estimated at 20% of direct and IFC.

Bond

This is the contractor's cost to bond the project; it is estimated at 1% of total direct and IFC.

Sales Tax

This cost is calculated at 6% of the total material cost (direct and indirect).

Construction Management

This cost is calculated at 30% of the direct and indirect labor cost.

Risk Budget

Cost risk analysis for capital cost is 14.8%, which is based on the capital risk analysis for the AWR and Silo 3 projects.

C.3.2.2.6 References

Basis of Design and Description (Appendix G).

C.3.2.2.7 Attachment

The capital cost estimate summary for the Vitrification — Other (VIT2) alternative, prepared by the FDF cost estimating team, is attached to this section.

<END OF PAGE>

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Attachment C.3.2.I

Capital Cost Estimate Summary for

Vitrification — Other

CONTROL ES ATE SUMMARY

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	DETAIL - ITEM NO. 1	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
001	PRE-MOBILIZATION																
	DOCUMENTATION																
	(Fm. Pre-mob to thru De-mob.) (100% Paymnt. upon receipt)																
	FDF AUTHORIZATION to MOBILIZE																
	HEALTH & SAFETY PROGRAM																
	- Accident Prevention Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	- Respirator Program	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	- Heat & Cold Stress Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Substance Abuse Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Fall Protection Plan	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- MSDS Documentation	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	LABOR RELATIONS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WORK FORCE UTILIZATION PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SAFETY ASSESSMENT (CONST.)	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	TURNOVER PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SYSTEM OPERABILITY TEST REPORT	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WASTE MANEGMENT PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	HAZOP's REVIEW & REPORT	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	CONSTRUCTION ACCEPTANCE TESTS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	TRAINING OF PERSONNEL (Prior to Site Access)	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFETY BASIS ASSESSMENT -																
	- Documentation - 6 mo.	1	LS	1040.0	1,040	$75.00					$78,000				$78,000	C	
	- Calculation - 12 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	- PHA - 2 x 6 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	FDF AUTHORIZATION to OPERATE																
	OPERATIONS PROCEDURES	1	LS	1200.0	1,200	$75.00					$90,000				$90,000	C	
	INSPECTIONS & PERIODIC MAINTENANCE PLAN	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	OPERATIONS SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	STANDING ORDERS MANUAL	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	LESSONS PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	
	OPERATOR TRAINING PROGRAM PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000		
	OPERATIONS & MAINTENANCE PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	

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CONTROL ESTIMATE SUMMARY

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	DETAIL - ITEM NO. 1	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
001.																	
	CONTRACTORS SUBMITTALS																
	Project Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Engineering Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Configuration Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Records Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	System Eng. Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Independ. saftey Review Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Procurement Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Contingency Plan & Emerg. Response	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Environmental Control Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
																C	
	Sampling Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Quality Assurance Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Schedules	1	LS	1060.0	1,060	$75.00					$79,500				$79,500	C	
	TOTAL COST ITEM NO. 1	1	LOT								$678,000				$678,000		

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ESTIMATE SUMMARY SHEET

FLUOR DANIEL FERNALD

PROJECT:	Silos 1 & 2 Combustion Vitrify (FS)	DATE:	05-Nov-99
ESTIMATE NO.:	C4981001	ESTIMATOR:	J. ELLIS
CLIENT:	DOE	LOCATION:	FERNALD
WBS NO.:	2.1.3.G.P	TASK NO.:	4S11B

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO. 2	AAA - MOBILIZATION	800		$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities	8,781		$192,993		$108,550	$9,800	$311,343
	100 - Concrete All Facilities	129,292		$2,743,600		$1,704,100		$4,447,700
	200 - Structural Steel- All Facilities	16,920		$383,700		$986,900		$1,370,600
	300 - Architectural/Buildings/Finishes-All Fac	35,843		$819,400		$1,472,000		$2,291,400
	400 - Equipment Systems 15 - 94	25,662		$631,000			$13,997,000	$14,628,000
	500 - Piping	17,952		$441,400		$522,400		$963,800
	600 - Electrical	61,325		$1,294,900		$907,700	$982,000	$3,184,600
	700 - Instrumentation	5,092		$107,500		$1,418,300		$1,525,800
	800 - Paint / Insulation	16,940		$375,700		$179,800		$555,500
	RCS BUILDING	6,311		$130,500		$117,800		$248,300
DIRECT FIELD COSTS TOTAL		324,918	$22.10	$7,180,693	$669,600	$7,417,550	$14,988,800	$30,256,643
SUPERVISION - CONTRACTOR		55,235		$1,220,700				$1,220,700
SMALL TOOLS & CONSUMABLES						$430,800		$430,800
MISC. EQUIP. RENTAL							$1,137,200	$1,137,200
TEMPORARY FACILITIES		9,748		$215,400		$215,400		$430,800
TEMPORARY UTILITY HOOK-UP		6,336		$140,000		$75,400		$215,400
JOB CLEAN-UP		14,621		$323,100		$107,700		$430,800
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)								
HEALTH PHYSICS S/C		11,882		$262,600		$57,700		$320,300
SCLA - 40 HRs/FTE		4,375		$96,700				$96,700
GET/SITE ACCESS & JOB SPECIFIC TRAINING		3,150		$69,600				$69,600
PAYROLL BURDENS & BENEFITS		-	-	$5,420,000				$5,420,000
OVERHEAD & PROFIT		-	-		$8,005,800			$8,005,800
BOND		-	-		$480,300			$480,300
SALES TAX		-	-			$498,300	$967,600	$1,465,900
INDIRECT FIELD COSTS TOTAL		105,347		$7,748,100	$8,486,100	$1,385,300	$2,104,800	$19,724,300
DIRECT & INDIRECT FIELD COSTS TOTAL- ITEM NO. 2		430,265	$34.70	$14,928,793	$9,155,700	$8,802,850	$17,093,600	$49,980,943
WASTE DISPOSITION MGMT. - FD FERNALD								
OFF-SITE DISPOSAL COSTS (Commercial)								
WASTE MANAGEMENT COSTS TOTAL								
PROJECT MANAGEMENT - FD FERNALD								
CONSTRUCTION MANAGEMENT - FD FERNALD				$4,478,600				$4,478,600
FD FERNALD FIELD SUPPORT COSTS TOTAL - ITEM NO. 3				$4,478,600				$4,478,600
ENGINEERING/DESIGN/INSPECTION - FD FERNALD								
ENGINEERING/DESIGN/INSPECTION - A/E					$25,050,900			$25,050,900
ENGINEERING COSTS TOTAL - ITEM NO. 4					$25,050,900			$25,050,900
SALES TAX - FD FERNALD								
SUB-TOTAL (BASE ESTIMATE)								$79,510,400
RISK BUDGET	14.8%	ITEM NO. 5						$11,767,500
TARGET ESTIMATE		(FY 99 DOLLARS)						$91,277,900
CONTINGENCY	8.0%							$6,360,800
, BURIAL FEE								

ESTIMATE PERFORMED BY ESTIMATING SERVICES

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PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY - ITEM NO. 2	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	AAA - MOBILIZATION				800						$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities				8,781						$192,993		$108,550	$9,800	$311,343
	100 - Concrete All Facilities				129,292						$2,743,600		$1,704,100		$4,447,700
	200 - Structural Steel- All Facilities				16,920						$383,700		$986,900		$1,370,600
	300 - Architectural/Buildings/Finishes-All Fac				35,843						$819,400		$1,472,000		$2,291,400
	400 - Equipment Systems 15 - 94				25,662						$631,000			$13,997,000	$14,628,000
	500 - Piping				17,952						$441,400		$522,400		$963,800
	600 - Electrical				61,325						$1,294,900		$907,700	$982,000	$3,184,600
	700 - Instrumentation				5,092						$107,500		$1,418,300		$1,525,800
	800 - Paint / Insulation				16,940						$375,700		$179,800		$555,500
	RCS BUILDING				6,311						$130,500		$117,800		$248,300
	Note: The Process, Utility and Electrical Equipment Estimates are based on the Equipment List dated 09-21-99.														
	Subtotal Direct Cost	1	LOT		324,918	$22.10					$7,180,693	$669,600	$7,417,550	$14,988,800	$30,256,643

000249

7-8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	AAA - MOBILIZATION	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	ALIGNMENT & PROJECT MEETINGS														
	(5) MEETINGS, 2 DAYS EACH for (7) People														
	TRAVEL - AIR FARE	35.0	TRIPS					$1,000.00				$35,000			$35,000
	CAR RENTAL - (2) CARS PER TRIP @ (2) DAYS EA	20.0	DAYS					$50.00				$1,000			$1,000
	GASOLINE - 200 mi./TRIP/CAR	2,000.0	MI					$1.45				$2,900			$2,900
	CAR LEASING - (2) CARS	2.0	CARS					$12,000				$24,000			$24,000
	PER DIEM -	70.0	PD					$96.00				$6,720			$6,720
	LABOR @ 8 HRS /DAY	560.0	MH	1.0	560	$75.00					$42,000				$42,000
	RELOCATION														
	HOUSEHOLD MOVE & TRAVEL FY98 REPLAN	10	PEOPLE					$45,000				$450,000			$450,000
	EXPENSE FY98 REPLAN	10	PEOPLE					$15,000				$150,000			$150,000
	TOTAL COST for ALIGNMENT	1	LS								$42,000	$669,620			$711,620
	HEALTH & SAFETY PLAN - PRE OPERATIONAL														
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	TOTAL - HEALTH $ SAFETY	1	LS		240						$18,000				$18,000
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		800	$75.00					60,000	669,600			$729,600

000250

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	A. RECEIVING & LAYDOWN AREAS														
	1. for EQUIPMENT - 150' x 150' x 1'														
	i. Subgrade Pavement Base	2,500	SY	0.016	47	20.27	0.38			0.68	$950			$1,690	$2,640
	ii. Base Course, 12" deep	2,500	SY	0.017	50	20.27	0.40		8.05	0.52	$1,010		$20,130	$1,310	$22,450
	iii. Stabilization Fabric, 6 oz.	2,500	SY	0.030	89	20.27	0.72		2.45	0.12	$1,800		$6,130	$300	$8,230
	iv. Penetration crushed stone, 4" thk	2,500	SY	0.020	59	20.27	0.48		1.46	0.02	$1,200		$3,650	$50	$4,900
	2. extension of utilities														
	i. Tie-in water supply	1	LS	80.00	95	20.27	1930.00		500.00	2180.00	$1,930		$500	$2,180	$4,610
	ii. Tie-in electrical system	1	LS	80.00	95	20.27	1930.00		500.00	1500.00	$1,930		$500	$1,500	$3,930
	iii. Subgrade pavement base	225	SY	0.016	4	20.27	0.36		2.45	0.12	$80		$550	$30	$660
	iv. Base Course 12" deep	225	SY	0.017	5	20.27	0.44		1.46	0.02	$100		$330		$430
	B. RELOCATE EXISTING ITEMS														
	i. Subgrade Pavement Base	1,000	SY	0.016	19	20.27	0.39			0.68	$390			$680	$1,070
	ii. Base Course, 12" deep	1,000	SY	0.017	20	20.27	0.41		8.05	0.52	$410		$8,050	$520	$8,980
	iii. Stabilization Fabric, 6 oz.	1,000	SY	0.003	4	20.27	0.08		2.45	0.12	$80		$2,450	$120	$2,650
	iv. Penetration crushed stone, 4" thk	1,000	SY	0.002	2	20.27	0.04		1.46	0.02	$40		$1,460	$20	$1,520
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	C. STORMWATER MANAGEMENT														
	1. WASTE PREP BLDG.														
mD	i. Excav. footings,Piers,gradebeams	234	BCY	0.34	80	28.68	9.80			1.28	$2,294			$300	$2,594
mD	ii. Backfill footings,Piers,gradebeams	409	ICY	0.22	90	26.76	5.89			0.98	$2,409			$400	$2,809
	iii. Haul excess to stockpile	156	LCY	0.48	75	22.94	11.03			1.92	$1,721			$300	$2,021
mD	iv. Excav. Interior Wall footings	120	BCY	0.33	40	23.75	7.92			0.83	$950			$100	$1,050
mD	v. Backfill Interior Wall Footings	87	ICY	0.37	32	25.00	9.20			1.15	$800			$100	$900
	vi. Haul excess to stockpile	50	LCY	1.14	57	22.81	26.00			4.00	$1,300			$200	$1,500
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		1,103	$33.90					37,393		43,760	9,800	$90,943

00251

81113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Civil & Excavation All Facilities														
	D. Prod. Handl. and Storage Facility														
D	1. Excavate area	16535	CY	0.11	2156	20.27					$43,700				$43,700
D	2. Backfill and compact area	13365	CY	0.15	2377	20.27					$48,180				$48,180
D	3. Install vapor barrier	77680	SF	0.008	737	20.27			0.09		$14,940		$7,170		$22,110
D	4. Haul and dump	5581	CY	0.08	529	20.27					$10,720				$10,720
D	5. Sand bedding	360	CY	0.75	320	20.27			12.00		$6,490		$4,430		$10,920
D	6 Concrete filled pipe barriers	25	EA	0.75	22	20.27			66		$450		$1,690		$2,140
	E. Site Work														
D	1. Grade, Scarity & Compavt Site	19584	SY	0.03	673	20.27					$13,640				$13,640
D	2. Rough grade & Compact for roads	2319	SY	0.04	104	20.27					$2,110				$2,110
D	3. Spread & Compact crushed Rock for ro	2319	SY	0.02	47	20.27			2.40		$950		$5,700		$6,650
D	4. Install asphalt for roads	1829	SY	0.03	54	20.27			8.16		$1,090		$15,300		$16,390
D	5. Repair shoulder for roads	490	SY	0.02	12	20.27					$240				$240
D	6. Final Site Grading	9140	SY	0.01	130	20.27					$2,640				$2,640
D	7. Crushed rock for site	9140	SY	0.02	184	20.27			2.40		$3,730		$22,480		$26,210
D	1 Catch basin	4	EA	48.00	228	20.27			650.00		$4,620		$2,670		$7,290
D	2 C B Frame and cover	4	EA	5.00	24	20.27			210.00		$490		$860		$1,350
D	1 Install fencing	208	LF	0.25	62	20.27			19.33		$1,260		$4,120		$5,380
D	2 Gates	4	EA	4.00	19	20.27			100.00		$390		$410		$800
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		7,678	$20.27					156,800		64,800		$220,400

000252

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	100 - Concrete All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	CONCRETE														
	A. Prod. handl. and Storg. Fac.														
D	1. Install slab on grade	2396	CY	3.7	10511	21.22			85.4		$223,040		$209,730		$432,770
D	2. Install walls	4398	CY	12.2	63614	21.22			176.3		$1,349,890		$794,750		$2,144,640
D	3. Install structural footings	586	CY	6.7	4655	21.22			109.7		$98,780		$65,890		$164,670
D	4. Install continuous footings	700	CY	5.1	4233	21.22			113.40		$89,820		$81,360		$171,180
D	5. Install equipment foundations	225	CY	8.2	2187	21.22			105.60		$46,410		$24,350		$70,760
D	6. Grout area	360	CF	1.0	427	21.22			3.25		$9,060		$1,200		$10,260
D	7. Tilt-up walls	35865	SF	0.24	10164	21.22			3.63		$215,680		$133,300		$348,980
D	8. Install elevated slab	1343	CY	12.5	19903	21.22			181.50		$422,340		$249,850		$672,190
D	9. Install columns for modular walls	555	CY	18.45	12143	21.22			223.89		$257,670		$127,370		$385,040
D	10. Cooling tower	25	CY	11.9	353	21.22			142.44		$7,490		$3,650		$11,140
D	11. Install lumber	200	BF	0.0	5	21.22			0.38		$110		$80		$190
D	12. Install wire mesh	32	SF	0.1	4	21.22			3.25		$80		$110		$190
D	13. Stack Structurel footings	8	CY	6.70	64	21.22			109.70		$1,360		$900		$2,260
D	14. Stack base	4	CY	8.20	39	21.22			105.60		$830		$430		$1,260
D	15. Install guy anchors	12	CY	8.20	117	21.22			105.60		$2,480		$1,300		$3,780
D	16. Fabricate cover blocks	12	EA	36	517	21.22			633		$10,970		$7,790		$18,760
D	17. Install cover blocks	12	EA	9	123	21.22					$2,610				$2,610
D	18. Duct footings	11	CY	8.2	107	21.22			105.6		$2,270		$1,190		$3,460
D	Embedded bolts	126	EA	0.7	97	21.22			5.85		$2,060		$760		$2,820
D	Stairs	0.9	CY	27.0	29	21.22			143.3		$620		$130		$750
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		129,292	$21.22					2,743,600		1,704,100		$4,447,700

000253

81113

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	200 - Structural Steel- All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	STRUCTURAL STEEL														
D	1. Install metal roofing	23350	SF	0.008	221	22.68			0.72		$5,010		$17,230		$22,240
D	2. Install light steel	181	TON	25.0	5365	22.68			1750.00		$121,680		$324,670		$446,350
D	3. Install medium steel	108	TON	22.0	2817	22.68			1510.00		$63,890		$167,160		$231,050
D	4. Install heavy steel	115	TON	19.0	2591	22.68			1340.00		$58,760		$157,950		$216,710
D	5. Install crane rails	1.66	TON	12.0	24	22.68			880.00		$540		$1,500		$2,040
D	6. Install checkered plate	14058	SF	0.11	1833	22.68			5.92		$41,570		$85,300		$126,870
D	7. Install ladders	353	LF	0.64	268	22.68			56.50		$6,080		$20,440		$26,520
D	8. Install stairs	418	Riser	2.31	1145	22.68			87.50		$25,970		$37,490		$63,460
D	9. Install Handrail	273	LF	0.13	40	22.68			13.45		$910		$3,760		$4,670
D	10. Install divits	8	EA	10.00	95	22.68			750.00		$2,150		$6,150		$8,300
D	12. Install crane rail box beam	9.7	TON	17.30	199	22.68			1657.00		$4,510		$16,470		$20,980
D	13. Install supports for box beam	24	EA	10.00	285	22.68			700.00		$6,460		$17,220		$23,680
D	14. Install crane rail stops	4	PR	4.00	19	22.68			450.00		$430		$1,850		$2,280
D	15. Install Stack structure	8.69	TON	22.00	227	22.68			1510.00		$5,150		$13,450		$18,600
D	Metal floor	400	SF	0.11	52	22.68			5.92		$1,180		$2,430		$3,610
D	17. Install grading	1547	SF	0.15	275	22.68			8.40		$6,240		$13,320		$19,560
D	Guy wire	1200	LF	0.04	54	22.68			2.16		$1,220		$2,660		$3,880
D	21. Install kickplate	217	LF	0.05	13	22.68			3.60		$290		$800		$1,090
D	22. Install pre-engineered structure	10800	SF	0.05	640	22.68			5.18		$14,520		$57,340		$71,860
D	23. Install 2-1/2" x 2-1/2" x 1/4" angle iron	150	LF	0.09	17	22.68			3.64		$390		$560		$950
D	24. Install sumps	24	EA	26.00	740	22.68			1590.00		$16,780		$39,110		$55,890
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		16,920	$22.68					383,700		986,900		$1,370,600

000254

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	300 - Architectural/Buildings/Finishes-All Fac	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	ARCHITECTURAL														
D	1. Install metal stud w/gyp. board	13860	SF	0.051	838	22.68			1.02		$19,010		$14,490		$33,500
D	2. Install vents and drains	67125	SF	0.005	398	22.68			0.35		$9,030		$24,080		$33,110
D	3. Install cleaning agent	1	LOT	25.0	30	22.68			10700		$680		$10,970		$11,650
D	4. Install siding	59430	SF	0.041	2889	22.68			0.86		$65,520		$52,390		$117,910
D	5. Install roof insulation	23350	SF	0.007	194	22.68			0.44		$4,400		$10,530		$14,930
D	6. Install wall insulation	29715	SF	0.005	176	22.68			0.35		$3,990		$10,660		$14,650
D	7. Install membrane roofing	23350	SF	0.025	692	22.68			1.31		$15,690		$31,350		$47,040
D	8. Install 1/2" fiber board	23350	SF	0.009	249	22.68			0.20		$5,650		$4,790		$10,440
D	9. Install single exterior door 3x7	31	EA	8.00	294	22.68			680.00		$6,670		$21,610		$28,280
D	10. Install double ext. door 6x7	10	EA	14.00	166	22.68			970.00		$3,760		$9,940		$13,700
D	11. Install roll-up door 14' x 14'	11	EA	15.00	196	22.68			14000		$4,450		$157,850		$162,300
D	12. Install single int. door 3x7	35	EA	6.00	249	22.68			280.00		$5,650		$10,050		$15,700
D	13. Install double int. door 6x7	18	EA	12.00	256	22.68			510.00		$5,810		$9,410		$15,220
D	14. Install roof closure	641	LF	0.14	106	22.68			13.15		$2,400		$8,640		$11,040
D	15. Install bldg. communications	104689	SF	0.03	3724	22.68			0.53		$84,460		$56,870		$141,330
D	16. Install coated poly. bldg. cover	37060	SF	0.09	3998	22.68			8.61		$90,670		$327,060		$417,730
D	17. Install potent. cont. tank shelter	1	LOT	340.0	403	22.68			14100		$9,140		$14,450		$23,590
D	18 Block and level trailers	9	EA	50.0	534	22.68			13750		$12,110		$126,840		$138,950
D	19 Skirting around trailers	1356	SF	0.069	111	22.68			1.04		$2,520		$1,450		$3,970
D	20 Seal ext,roof,walls and floor	617	LF	0.250	183	22.68			3.50		$4,150		$2,210		$6,360
D	21 Fab and install srairs and ramp	1	LOT	120	142	22.68			1574		$3,220		$1,610		$4,830
D	22 Ceiling	100	SF	0.027	3	22.68			0.8		$70		$80		$150
D	Double interior door 10'x8'	2	EA	22	52	22.68			975		$1,180		$2,000		$3,180
D	1. install building sprinklers	100499	SF	0.053	6311	24.59			1.69		$155,190		$174,340		$329,530
D	Metering station shelter	1	EA	95	113	22.68			2980		$2,560		$3,050		$5,610
D	1. install HVAC ductwork galv. stl.	105378	LBS	0.06	7121	22.27			2.14		$158,580		$231,150		$389,730
D	2. install dampers	1	LOT	896	1062	22.27			33643		$23,650		$34,480		$58,130
D	3. install accessories	1	LOT	420	498	22.27			15776		$11,090		$16,170		$27,260
D	4. install supports	1	LOT	1194	1416	22.27			44795		$31,530		$45,910		$77,440
D	5. install insulation	1	LOT	1010	1197	22.27			37907		$26,660		$38,850		$65,510
D	6. Test and Balance	1	LOT	1494	1771	22.27					$39,440				$39,440
D	7. Install ductwork supports	12	EA	10.00	142	22.27			656.00		$3,160		$8,070		$11,230
D	8. Install ductwork to stack	250	LF	1.11	329	22.27			41.64		$7,330		$10,670		$18,000
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		35,843	$22.86					819,400		1,472,000		$2,291,400

000255

8113

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 15 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Machinery and Equipment														
	System Description														
	Mach. & Equip. (forward from M & E detail)														
D	15 - Feed Preparation	1	LOT	3620.0	4292	24.59				3304912	$105,540			$3,387,530	$3,493,070
D	17 - Processor	1	LOT	3320.0	3936	24.59				3013800	$96,790			$3,089,150	$3,185,940
D	18 - Process Offgas	1	LOT	2130.0	2525	24.59				795050	$62,090			$814,930	$877,020
D	20 - Radon Control	1	LOT	1325.0	1571	24.59				709330	$38,630			$727,060	$765,690
D	23 - Product Forming and Handling	1	LOT	225.0	267	24.59				153800	$6,570			$157,650	$164,220
D	25 - Container Receipt and Handling	1	LOT	795.0	943	24.59				686000	$23,190			$703,150	$726,340
D	26 - Product Recycle	1	LOT	635.0	753	24.59				592000	$18,520			$606,800	$625,320
D	40 - Plant and Instrument Air	1	LOT	290.0	344	24.59				42400	$8,460			$43,460	$51,920
D	41 - Breathing Air	1	LOT	80.0	95	24.59				212000	$2,340			$217,300	$219,640
D	44 - Product Additive	1	LOT	750.0	889	24.59				229550	$21,860			$235,290	$257,150
D	53 - Cooling Water	1	LOT	490.0	581	24.59				53800	$14,290			$55,150	$69,440
D	61 - Non-Radioactive Liquid Waste	1	LOT	670.0	794	24.59				135000	$19,520			$138,380	$157,900
D	63 - Laboratory Waste	1	LOT	20.0	24	24.59				600	$590			$620	$1,210
D	64 - Radioactive Liquid Waste	1	LOT	940.0	1114	24.59				191000	$27,390			$195,780	$223,170
D	73 - Product Handling Building HVAC	1	LOT	1470.0	1743	24.59				643600	$42,860			$659,690	$702,550
D	75 - Analytical Laboratory HVAC	1	LOT	305.0	362	24.59				60200	$8,900			$61,710	$70,610
D	76 - Maint. & Whse. Facilities HVAC	1	LOT	250.0	296	24.59				16050	$7,280			$16,450	$23,730
D	77 - Misc. Facilities HVAC	1	LOT	40.0	47	24.59				1600	$1,160			$1,640	$2,800
D	80 - Maintenance Equipment	1	LOT	690.0	818	24.59				246500	$20,110			$252,660	$272,770
D	82 - Remote Handling Equipment	1	LOT	955.0	1132	24.59				900000	$27,840			$922,500	$950,340
D	83 - Radiation Shielding Equipment	1	LOT	1410.0	1672	24.59				238400	$41,110			$244,360	$285,470
D	84 - Sampling	1	LOT	105.0	124	24.59				5000	$3,050			$5,130	$8,180
D	85 - CCTV	1	LOT	780.0	925	24.59				300000	$22,750			$307,500	$330,250
D	93 - Health Protection	1	LOT	50.0	59	24.59				5000	$1,450			$5,130	$6,580
D	94 - Analytical Laboratory Equipment	1	LOT	300.0	356	24.59				1120000	$8,750			$1,148,000	$1,156,750
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		25,662	$24.59					631,000			13,997,000	$14,628,000

000256

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	500 - Piping	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	**PIPING SYSTEMS**														
	System 15 & 16														
D	1. Install 1/2" c.s. gate valve	65	EA	1.20	92	24.59			61.5		$2,260		$4,100		$6,360
D	2. Install 3/4" c.s. gate valve	16	EA	1.30	25	24.59			69.75		$610		$1,140		$1,750
D	3. Install 2" c.s. gate valve	16	EA	1.70	32	24.59			207.75		$790		$3,410		$4,200
D	1. Install 1/2" s.s. gate valve	31	EA	1.30	48	24.59			257.25		$1,180		$8,170		$9,350
D	2. Install 3/4" s.s. gate valve	2	EA	1.40	3	24.59			316.05		$70		$650		$720
D	3. Install 2" s.s. gate valve	2	EA	1.90	5	24.59			464.31		$120		$950		$1,070
D	3" Sch 40 pvc pipe	500	LF	0.03	20	23.90	$478		1.6		$480		$820		$1,300
D	Metering station	1	EA	20.00	24	23.90	$574		2150		$570		$2,200		$2,770
D	Tie-in to gas main	1	EA	3.00	4	23.90	$96		345		$100		$350		$450
D	11. Install bin loading lines	245	LF	0.46	134	24.59			17.66		$3,300		$4,430		$7,730
	System 52														
D	1. Install 4" post indicator valves	1	EA	6.50	8	24.59			5200.00		$200		$5,330		$5,530
D	2. Install 12" std. wt cs pipe	1240	LF	0.59	863	24.59			42.65		$21,220		$54,210		$75,430
D	3. Install 8" std. wt cs pipe	650	LF	0.41	313	24.59			25.71		$7,700		$17,130		$24,830
D	4. Install 4" std. wt cs pipe	1100	LF	0.24	306	24.59			10.92		$7,520		$12,310		$19,830
D	5. Install hydrants	21	EA	4.00	100	24.59			700.00		$2,460		$15,070		$17,530
D	6. Install 4" gate valves	21	EA	4.00	100	24.59			850.00		$2,460		$18,300		$20,760
D	7. Install valve boxes	21	EA	6.00	149	24.59			325.00		$3,660		$7,000		$10,660
D	8. Install 4" post indicator valves	3	EA	8.00	28	24.59			1100.00		$690		$3,380		$4,070
D	9. Install 8" post indicator valves	1	EA	12.00	14	24.59			2750.00		$340		$2,820		$3,160
	System 61														
D	1. Install drain line cs-pipe	1500	LF	0.39	699	24.59			8.48		$17,190		$13,040		$30,230
D	3. Install double cont. pipe - HDPE pipe	2100	LF	0.69	1718	24.59			26.00		$42,250		$55,970		$98,220
D	1 Relocate 30" storm water line	150	LF	1.30	231	24.59					$5,680				$5,680
D	2 New storm water line(HDPE)	300	LF	0.83	293	24.59			67.51		$7,200		$20,760		$27,960
D	1. Install piping including valves	1	LOT	10748	12743	24.59			264290		$313,350		$270,900		$584,250
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		17,952	$24.59					441,400		522,400		$963,800

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000257

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Feed Preparation -15														
D	1. Install lighting to Anal. Lab. & Control	4248	SF	0.20	1007	21.12			4.30		$21,270		$18,720		$39,990
D	2. Install lighting to On-Site storage fac.	26260	SF	0.08	2491	21.12			1.62		$52,610		$43,600		$96,210
D	3. Install lighting to Additive strge. bin fa	74181	SF	0.05	4397	21.12			1.08		$92,860		$82,120		$174,980
D	6. Install electrical bulk for addit. instrum	1	LOT	195.0	231	21.12			2750		$4,880		$2,820		$7,700
D	7. Install miscl. mtrl	1	LOT	755.0	895	21.12			12986		$18,900		$13,310		$32,210
D	1. Install 480v pr. & mtr. feeders up to 10hp	13	EA	12.9	199	21.12			181.00		$4,200		$2,410		$6,610
D	2. Install 480v pr. & mtr. feeders 15hp	5	EA	12.9	76	21.12			181.00		$1,610		$930		$2,540
D	3. Install 480v pr. & mtr. feeders 20hp	1	EA	13.2	16	21.12			164.00		$340		$170		$510
D	2. Install 480v pr. & mtr. feeders 25hp	2	EA	13.2	31	21.12			164.00		$650		$340		$990
D	3. Install 480v pr. & mtr. feeders 30hp	2	EA	13.2	31	21.12			164.00		$650		$340		$990
D	4. Install 480v pr. & mtr. feeders 40hp	4	EA	13.2	63	21.12			164.00		$1,330		$670		$2,000
D	5. Install start-stop station fac. sealed	30	EA	2.3	82	21.12			120.00		$1,730		$3,690		$5,420
D	6. Install 480v pr. & mtr. feeders 100hp	1	EA	10.1	12	21.12			187.00		$250		$190		$440
D	Install 3/4" flex cond. w/ 2 connrct.	3	LOT	0.8	3	21.12			12.05		$60		$40		$100
D	Install 480v pr. & mtr. feeders 240hp	2	EA	14.8	35	21.12			638.00		$740		$1,310		$2,050
D	7. Install 3/4" cond. galv. stl.	15470	FT	0.08	1467	21.12			0.90		$30,980		$14,270		$45,250
D	8. Install 1" cond. galv. stl.	5300	FT	0.11	691	21.12			1.44		$14,590		$7,820		$22,410
D	9. Install 2" cond. galv. stl.	870	FT	0.17	175	21.12			3.08		$3,700		$2,750		$6,450
D	10. Install 3" cond. galv. stl.	2000	FT	0.28	664	21.12			6.41		$14,020		$13,140		$27,160
D	11. Install 3/4" "L" ftg. w/cover & gasket	392	EA	1.0	465	21.12			9.90		$9,820		$3,980		$13,800
D	12. Install 1" "L" ftg. w/ cover & gasket	121	EA	1.2	172	21.12			14.60		$3,630		$1,810		$5,440
D	13. Install 2" "L" ftg. w/ cover & gasket	43	EA	2.5	127	21.12			42.00		$2,680		$1,850		$4,530
D	14. Install 3' "L" ftg. w/ cover & gasket	40	EA	4.5	213	21.12			161.00		$4,500		$6,600		$11,100
D	15. Install 3/4" cond. hub	24	EA	0.8	23	21.12			4.40		$490		$110		$600
D	16. Install 1" cond. hub	9	EA	1.0	11	21.12			5.20		$230		$50		$280
D	17. Install 3-#14cntrl. wire, str. cu 600v	15600	FT	0.03	499	21.12			0.21		$10,540		$3,360		$13,900
D	18. Install 3 #12w/ #12 grd. power wire	8320	FT	0.04	355	21.12			0.36		$7,500		$3,070		$10,570
D	19. Install 3 #10w/ #10 grd. power wire	2600	FT	0.04	136	21.12			0.44		$2,870		$1,170		$4,040
D	20. Install 3 #6w/ #8 grd. power wire	3120	FT	0.06	218	21.12			0.85		$4,600		$2,720		$7,320
D	21. Install 1/c #14 wire term, 600v	180	EA	0.2	43	21.12			0.20		$910		$40		$950
D	22. Install 1/c #12 wire term, 600v	104	EA	0.2	25	21.12			0.25		$530		$30		$560
D	23. Install 1/c #10 wire term, 600v	110	EA	0.2	26	21.12			0.25		$550		$30		$580
D	24. Install 1/c #8 wire term, 600v	30	EA	0.3	11	21.12			0.90		$230		$30		$260

000258

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	25. Install 1/c #6 wire term, 600v	36	EA	0.4	23	21.12			1.00		$490		$40		$530
D	26. Install 14- #10 mtr. cont. kit, 600v	18	EA	0.5	11	21.12			12.00		$230		$220		$450
D	27. Install 8 - #4 mtr. cont. kit, 600v	9	EA	0.6	6	21.12			21.00		$130		$190		$320
D	28. Install flex cond. conn. assy	176	EA	1.1	230	21.12			14.00		$4,860		$2,530		$7,390
D	29. Install st. stl. box 20"x20"x6" w/term.	9	EA	10.3	110	21.12			630.00		$2,320		$5,810		$8,130
D	30. Install 3/4" conduit seal "EYS"	24	EA	0.90	26	21.12			10.00		$550		$250		$800
D	31. Install 1" conduit seal "EYS"	9	EA	1.00	11	21.12			13.00		$230		$120		$350
D	32. Install 2" conduit seal "EYS"	9	EA	1.60	17	21.12			30.20		$360		$280		$640
D	33. Install 2" galv. ridg. stl. conduit	70	FT	0.17	14	21.12			3.80		$300		$270		$570
D	34. Install power wire 600v, 1/c #2	10	EA	0.50	6	21.12			2.45		$130		$30		$160
D	35. Install power wire 600v, 1/c #4/0	6	EA	1.10	8	21.12			4.30		$170		$30		$200
D	36. Install power wire 600v, 3 #250kcm w/ #2	24	EA	1.30	37	21.12			5.10		$780		$130		$910
D	37. Install 2" "L" ftg. w/cover & gasket	3	EA	2.50	9	21.12			42.00		$190		$130		$320
D	38. Install 3/4" "T" ftg. w/cover & gasket	168	EA	1.20	239	21.12			11.00		$5,050		$1,890		$6,940
D	39. Install 1" "T" ftg. w/cover & gasket	31	EA	1.50	55	21.12			16.60		$1,160		$530		$1,690
D	40. Install 1-1/2" "T" ftg. w/cover & gasket	31	EA	2.50	92	21.12			30.30		$1,940		$960		$2,900
D	41. Install 2" "T" ftg. w/cover & gasket	33	EA	3.00	117	21.12			46.30		$2,470		$1,570		$4,040
D	42. Install 3/4" conduit union "UNY"	154	EA	0.80	146	21.12			7.90		$3,080		$1,250		$4,330
D	43. Install 1" conduit union "UNY"	48	EA	1.00	57	21.12			13.40		$1,200		$660		$1,860
D	44. Install 2" conduit union "UNY"	20	EA	1.90	45	21.12			34.40		$950		$710		$1,660
D	45. Install 3" conduit union "UNY"	16	EA	2.50	47	21.12			76.00		$990		$1,250		$2,240
D	46. Install 2" conduit hub	9	EA	1.90	20	21.12			11.00		$420		$100		$520
D	47. Install 3" conduit seal "EYS"	6	EA	2.10	15	21.12			59.40		$320		$370		$690
D	48. Install 1/2" conduit drain	128	EA	0.20	30	21.12			25.00		$630		$3,280		$3,910
D	49. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	17200	FT	0.02	367	21.12			0.23		$7,750		$4,050		$11,800
D	50. Install 1pr-#16 wire termination, 300v	352	EA	0.40	167	21.12			0.30		$3,530		$110		$3,640
D	51. Install 3" conduit seal "EYS"	2	EA	2.10	5	21.12			59.40		$110		$120		$230
D	52. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	53. Install 3" conduit hub	6	EA	2.50	18	21.12			33.30		$380		$200		$580
D	54. Install mtr. flex cond. 480v, 200hp	2	EA	14.80	35	21.12			638.00		$740		$1,310		$2,050
D	55. Install wire term. 600v, 3#8 w/#10 grd	1560	EA	0.05	98	21.12			0.60		$2,070		$960		$3,030
D	56. Install wire term. 600v, 3 #4/0 w #2grd	520	EA	0.15	91	21.12			5.33		$1,920		$2,840		$4,760
D	57. Install wire term. 600v, 3#250kcm w/ #2	2080	EA	0.17	407	21.12			6.44		$8,600		$13,730		$22,330
D	58. Install wire term. 600v, 1/c #350 kcm	12	EA	1.50	21	21.12			6.20		$440		$80		$520

000259

8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	59. Install Mtr. cont. kit, 600v, #2 - #4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	60. Install Mtr. cont. kit, 600v, #250 kcm - 50	4	EA	1.50	7	21.12			57.80		$150		$240		$390
D	Install 1-1/2" conduit union "UNY"	12	EA	1.50	21	21.12			26.70		$440		$330		$770
D	Install 1-1/2" galv. ridg. stl. conduit	740	FT	0.14	123	21.12			2.30		$2,600		$1,740		$4,340
D	Install 1-1/2" "L" ftg. w/cover & gasket	31	EA	2.00	74	21.12			27.00		$1,560		$860		$2,420
D	Install misc. material & support matrl.	1	EA	755.00	755	21.12			12986		$15,950		$13,310		$29,260
	Processor - 17														
D	1. Install 3/4" flex cond. w/ 2 cont.	1	LOT	0.8	1	21.12			12.05		$20		$10		$30
D	2. Install starter & fused disc. switch	1	EA	2.3	3	21.12			120.00		$60		$120		$180
D	3. Install 3/4" cond. galv. stl.	370	FT	0.08	35	21.12			0.95		$740		$360		$1,100
D	4. Install 3/4" "L" ftg. w/ cover & gasket	8	EA	1.00	9	21.12			9.90		$190		$80		$270
D	6. Install 3/4" cond. seal "EYS"	1	EA	0.9	1	21.12			10.00		$20		$10		$30
D	7. Install 3/4" cond. hub	1	EA	0.8	1	21.12			4.40		$20				$20
D	Install 3/4" cond. union "UNY"	3	EA	0.8	3	21.12			7.90		$60		$20		$80
D	8. Install power wire 3 #12 w/#12 grd.	385	FT	0.04	16	21.12			0.40		$340		$160		$500
D	9. Install wire term. , 600v, 1/c #12	8	EA	0.20	2	21.12			0.25		$40				$40
D	10. Install wire term., 600v, 1/c #14	6	EA	0.20	1	21.12			0.20		$20				$20
D	11. Install contrl. wire 600v, 3 #14	385	FT	0.03	12	21.12			0.21		$250		$80		$330
D	12. Install flex cond. conn. assy	14	EA	1.1	18	21.12			14.00		$380		$200		$580
D	Install stn. stl. box 20" x 20" x 6"	1	EA	10.3	12	21.12			630.00		$250		$650		$900
D	13. Install 3/4" galv. ridg. stl. conduit	380	FT	0.08	36	21.12			0.90		$760		$350		$1,110
D	14. Install 1" galv. ridg. stl. conduit	90	FT	0.11	12	21.12			1.44		$250		$130		$380
D	Install 1-1/2" galv. ridg. stl. conduit	80	FT	0.14	13	21.12			2.30		$270		$190		$460
D	Install 2" galv. ridg. stl. conduit	40	FT	0.17	8	21.12			3.08		$170		$130		$300
D	15. Install 3/4" "L" ftg. w/cover & gasket	15	EA	1.00	18	21.12			9.50		$380		$150		$530
D	16. Install 1" "L" ftg. w/cover & gasket	3	EA	1.20	4	21.12			14.50		$80		$40		$120
D	Install 1-1/2" "L" ftg. w/cover & gasket	3	EA	2.00	7	21.12			27.00		$150		$80		$230
D	Install 2" "L" ftg. w/cover & gasket	2	EA	2.50	6	21.12			42.00		$130		$90		$220
D	17. Install 3/4" "T" ftg. w/cover & gasket	17	EA	1.20	24	21.12			11.30		$510		$200		$710
D	18. Install 1" "T" ftg. w/cover & gasket	3	EA	1.50	5	21.12			16.60		$110		$50		$160
D	Install 1-1/2" "T" ftg. w/cover & gasket	3	EA	2.50	9	21.12			30.30		$190		$90		$280
D	Install 2" "T" ftg. w/cover & gasket	3	EA	3.00	11	21.12			46.30		$230		$140		$370
D	19. Install 3/4" conduit union "UNY"	6	EA	0.80	6	21.12			7.90		$130		$50		$180

000260

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
. 2															
D	20. Install 1" conduit union "UNY"	3	EA	1.00	4	21.12			13.40		$80		$40		$120
D	Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	21. Install 2" conduit hub	1	EA	1.90	2	21.12			11.00		$40		$10		$50
D	22. Install 2" conduit seal "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	23. Install 1/2" conduit drain	10	EA	0.20	2	21.12			25.00		$40		$260		$300
D	24. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	1600	FT	0.02	34	21.12			0.23		$720		$380		$1,100
D	25. Install 1pr-#16 wire termination, 300v	28	EA	0.40	13	21.12			0.30		$270		$10		$280
D	Install misc. material & support matrl.	1	EA	29.00	29	21.12			431		$610		$440		$1,050
	Processor Off-gas - 18														
D	1. Install 480v pr. & mtr. feeders up to 10hp	13	EA	12.9	199	21.12			181.00		$4,200		$2,410		$6,610
D	2. Install 480v pr. & mtr. feeders 15hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	3. Install 480v pr. & mtr. feeders 40hp	1	EA	10.1	12	21.12			187.00		$250		$190		$440
D	4. Install start-stop push button station	16	EA	2.30	44	21.12			120.00		$930		$1,970		$2,900
D	5. Install 3/4" conduit galv. rigid stl.	9100	FT	0.08	863	21.12			0.95		$18,230		$8,860		$27,090
D	6. Install 1-1/2" conduit galv. rigid stl.	550	FT	0.14	91	21.12			2.30		$1,920		$1,300		$3,220
D	7. Install 3/4" "L" ftg. w/cover & gasket	182	EA	1.00	216	21.12			9.90		$4,560		$1,850		$6,410
D	8. Install 1-1/2" "L" ftg. w/cover & gasket	11	EA	2.00	26	21.12			27.00		$550		$300		$850
D	9. Install 3/4" conduit union "UNY"	73	EA	0.80	69	21.12			7.90		$1,460		$590		$2,050
D	10. Install 1-1/2" conduit union "UNY"	4	EA	1.50	7	21.12			26.70		$150		$110		$260
D	11. Install 3/4" conduit seal "EYS"	20	EA	0.90	21	21.12			10.00		$440		$210		$650
D	12. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	13. Install 3/4" conduit hub	20	EA	0.80	19	21.12			4.40		$400		$90		$490
D	14. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	15. Install cntrl. wire str cu 600v, 3 #14	9120	FT	0.03	292	21.12			0.21		$6,170		$1,960		$8,130
D	16. Install power wire 3#12 w/ #12 grd.	9000	FT	0.04	384	21.12			0.40		$8,110		$3,690		$11,800
D	17. Install power wire 3#10 w/ #10 grd.	1140	FT	0.04	59	21.12			0.48		$1,250		$560		$1,810
D	18. Install power wire 3#6 w/ #8 grd.	570	FT	0.11	77	21.12			3.18		$1,630		$1,860		$3,490
D	19. Install wire term. 600v, 1/c #14	96	EA	0.20	23	21.12			0.20		$490		$20		$510
D	20. Install wire term. 600v, 1/c #12	104	EA	0.20	25	21.12			0.25		$530		$30		$560
D	21. Install wire term. 600v, 1/c #10	16	EA	0.20	4	21.12			0.25		$80				$80
D	22. Install wire term. 600v, 1/c #4	2	EA	0.40	1	21.12			1.30		$20				$20
D	23. Install wire term. 600v, 1/c #2/o	6	EA	0.80	6	21.12			3.20		$130		$20		$150

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8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
-2															
D	24. Install mtr. cont. kit, 600V, #14- #10	15	EA	0.50	9	21.12			12.00		$190		$180		$370
D	25. Install mtr. cont. kit, 600V, #2- #4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	26. Install flex cond. conn. assy	68	EA	1.1	89	21.12			14.00		$1,880		$980		$2,860
D	27. Install st. stl. box 20"x20"x6" w/term.	4	EA	10.3	49	21.12			630.00		$1,030		$2,580		$3,610
D	28. Install 3/4" galv. ridg. stl. conduit	1400	FT	0.08	133	21.12			0.95		$2,810		$1,360		$4,170
D	29. Install 1" galv. ridg. stl. conduit	340	FT	0.11	44	21.12			1.44		$930		$500		$1,430
D	30. Install1-1/2" galv. ridg. stl. conduit	300	FT	0.14	50	21.12			2.30		$1,060		$710		$1,770
D	31. Install 2" galv. ridg. stl. conduit	130	FT	0.17	26	21.12			3.08		$550		$410		$960
D	32. Install 3/4" "L" ftg. w/cover & gasket	60	EA	1.00	71	21.12			9.90		$1,500		$610		$2,110
D	33. Install 1" "L" ftg. w/cover & gasket	13	EA	1.20	18	21.12			14.60		$380		$190		$570
D	34. Install 1-1/2" "L" ftg. w/cover & gasket	13	EA	2.00	31	21.12			27.00		$650		$360		$1,010
D	35. Install 2" "L" ftg. w/cover & gasket	5	EA	2.50	15	21.12			42.00		$320		$220		$540
D	36. Install 3/4" "T" ftg. w/cover & gasket	68	EA	1.20	97	21.12			11.30		$2,050		$790		$2,840
D	37. Install 1" "T" ftg. w/cover & gasket	13	EA	1.50	23	21.12			16.60		$490		$220		$710
D	38. Install 1-1/2" "T" ftg. w/cover & gasket	13	EA	2.50	39	21.12			30.30		$820		$400		$1,220
D	39. Install 2" "T" ftg. w/cover & gasket	13	EA	3.00	46	21.12			46.30		$970		$620		$1,590
D	40. Install 3/4" conduit union "UNY"	23	EA	0.80	22	21.12			7.90		$460		$190		$650
D	41. Install 1" conduit union "UNY"	5	EA	1.00	6	21.12			13.40		$130		$70		$200
D	42. Install 1-1/2" conduit union "UNY"	5	EA	1.50	9	21.12			26.70		$190		$140		$330
D	43. Install 2" conduit union "UNY"	8	EA	1.90	18	21.12			34.40		$380		$280		$660
D	44. Install 2" conduit hub	4	EA	1.90	9	21.12			11.00		$190		$50		$240
D	45. Install 2" conduit seal "EYS"	4	EA	1.60	8	21.12			30.20		$170		$120		$290
D	46. Install 1/2" conduit drain	50	EA	0.20	12	21.12			25.00		$250		$1,280		$1,530
D	47. Install 1pr #16 str cu shld. w/ pvc jkt, 300	6900	FT	0.02	147	21.12			0.23		$3,100		$1,630		$4,730
D	48. Install 1pr #16 wire term., 300v	136	EA	0.40	64	21.12			0.30		$1,350		$40		$1,390
D	49. Install 3/4" eal. flex cond. w/ 2 conn.	5	LOT	0.80	5	21.12			12.05		$110		$60		$170
D	Install misc. material & support matrl.	1	EA	301.00	301	21.12			4274		$6,360		$4,380		$10,740
	Radon Control -20														
D	1. Install 480v pr. & mtr. feeders up to 10hp	6	EA	12.9	92	21.12			181.00		$1,940		$1,110		$3,050
D	2. Install 480v pr. & mtr. feeders 15hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	3. Install starter & fused discnt. switch	5	EA	4.0	24	21.12			210.00		$510		$1,080		$1,590
D	4. Install start-stop push button station	8	EA	2.30	22	21.12			120.00		$460		$980		$1,440
D	5. Install 3/4" conduit galv. rigid stl.	6030	FT	0.08	572	21.12			0.95		$12,080		$5,870		$17,950

002262

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	6. Install 1" cond. galv. rigid stl.	1360	FT	0.11	177	21.12			1.44		$3,740		$2,010		$5,750
D	7. Install 1-1/2" cond. galv. rigid stl.	1340	FT	0.14	222	21.12			2.30		$4,690		$3,160		$7,850
D	8. Install 1" sealtite flex conduit w/ 2 conn.	2	LOT	1.10	3	21.12			18.70		$60		$40		$100
D	9. Install 1-1/2" sealtite flex conduit w/conn.	2	LOT	1.50	4	21.12			35.70		$80		$70		$150
D	10. Install 3/4" "L" ftg. w/ cover & gasket	142	EA	1.00	168	21.12			9.90		$3,550		$1,440		$4,990
D	11. Install 1" "L" ftg. w/ cover & gasket	31	EA	1.20	44	21.12			14.50		$930		$460		$1,390
D	12. Install 1-1/2" "L" ftg. w/ cover & gasket	31	EA	2.00	74	21.12			27.00		$1,560		$860		$2,420
D	13. Install 3/4" conduit union "UNY"	57	EA	0.80	54	21.12			7.90		$1,140		$460		$1,600
D	14. Install 1" conduit union "UNY"	13	EA	1.00	15	21.12			13.40		$320		$180		$500
D	15. Install 1-1/2" conduit union "UNY"	13	EA	1.50	23	21.12			26.70		$490		$360		$850
D	16. Install 3/4" conduit union "EYS"	9	EA	0.90	10	21.12			10.00		$210		$90		$300
D	17. Install 1" conduit union "EYS"	2	EA	1.00	2	21.12			13.00		$40		$30		$70
D	18. Install 1-1/2" conduit union "EYS"	2	EA	1.50	4	21.12			23.20		$80		$50		$130
D	19. Install 3/4" conduit hub	9	EA	0.80	9	21.12			4.40		$190		$40		$230
D	20. Install 1" conduit hub	2	EA	1.90	5	21.12			6.20		$110		$10		$120
D	21. Install 1-1/2" conduit hub	2	EA	2.50	6	21.12			7.90		$130		$20		$150
D	22. Install contrl wire 3-#14, 600v	4720	FT	0.03	151	21.12			0.21		$3,190		$1,020		$4,210
D	23. Install power wire 3#12 w/ #12 grd.	3540	FT	0.04	151	21.12			0.36		$3,190		$1,310		$4,500
D	24. Install power wire 3#10 w/ #10 grd.	1180	FT	0.04	62	21.12			0.48		$1,310		$580		$1,890
D	25. Install power wire 3#6 w/ #8 grd.	1180	FT	0.06	83	21.12			0.85		$1,750		$1,030		$2,780
D	26. Install power wire 3-#4 w/ #8grd.	1180	FT	0.07	95	21.12			1.15		$2,010		$1,390		$3,400
D	27. Install wire term. 600v, 1/c #14	48	EA	0.20	11	21.12			0.20		$230		$10		$240
D	28. Install wire term. 600v 1/c #12	48	EA	0.20	11	21.12			0.25		$230		$10		$240
D	29. Install wire term. 600v, 1/c #10	16	EA	0.20	4	21.12			0.25		$80				$80
D	30. Install wire term. 600v, 1/c #8	8	EA	0.30	3	21.12			1.00		$60		$10		$70
D	31. Install wire term. 600v, 1/c #6	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	32. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			8.90		$130		$110		$240
D	33. Install 3/4" seal flex cond. w/ 2 cont.	1	LOT	0.80	1	21.12			12.05		$20		$10		$30
D	34. Install mtr. connct. kit, 600v, #14-#10	8	EA	0.50	5	21.12			12.00		$110		$100		$210
D	35. Install instr. flex cond. conn. assy	38	EA	1.10	50	21.12			14.00		$1,060		$550		$1,610
D	36. Install stn. stl. box 20" x 20" x 6"	2	EA	10.30	24	21.12			630.00		$510		$1,290		$1,800
D	37. Install 2" galv. rigid stl. cond.	90	FT	0.17	18	21.12			3.08		$380		$280		$660
D	38. Install 2" "L" ftg. w/ cover & gasket	3	EA	2.50	9	21.12			42.00		$190		$130		$320

002063

- 8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Product Forming & Handling -23														
D	1. Install video cable	900	FT	0.01	11	21.12			0.21		$230		$190		$420
D	2. Install co-axial cable	20	EA	0.20	5	21.12			3.00		$110		$60		$170
D	2. Install miscl. matrl. & support mtrl.	1	EA	49.00	58	21.12			693.00		$1,220		$710		$1,930
D	3. Install 3/4" conduit galv. rigid stl.	2300	FT	0.08	218	21.12			0.90		$4,600		$2,120		$6,720
D	4. Install 3/4" "L" ftg. w/cover & gasket	66	EA	1.00	78	21.12			9.50		$1,650		$640		$2,290
D	5. Install 3/4" conduit union "UNY"	24	EA	0.80	23	21.12			7.50		$490		$180		$670
D	6. Install 3/4" conduit seal "EYS"	22	EA	0.90	23	21.12			9.50		$490		$210		$700
D	7. Install 3/4" cond. hub	22	EA	0.80	21	21.12			4.20		$440		$90		$530
D	8. Install power wire 3#12 w/ #12 grd.	1830	FT	0.04	78	21.12			0.40		$1,650		$750		$2,400
D	9. Install wire term. 600v, 1/c #12	96	EA	0.20	23	21.12			0.20		$490		$20		$510
D	10. Install 480v pr. & mtr. feeders up to 10hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	11. Install start-stop push button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
	Container Receipt & Handling System - 25														
D	1. Install 480v, mtr. flex cond. up to 10hp	7	EA	12.9	107	21.12			181.00		$2,260		$1,300		$3,560
D	2. Install starter & fused discnt. switch	7	EA	2.3	19	21.12			120.00		$400		$860		$1,260
D	3. Install 3/4" conduit galv. rigid stl.	2450	FT	0.08	232	21.12			0.90		$4,900		$2,260		$7,160
D	4. Install 3/4" "L" ftg. w/cover & gasket	50	EA	1.00	59	21.12			9.50		$1,250		$490		$1,740
D	5. Install 3/4" conduit union "UNY"	20	EA	0.80	19	21.12			9.90		$400		$200		$600
D	6. Install 3/4" conduit seal "EYS"	7	EA	0.90	7	21.12			10.00		$150		$70		$220
D	7. Install 3/4" cond. hub	7	EA	0.80	7	21.12			4.40		$150		$30		$180
D	8. Install power wire 3#12 w/ #12 grd.	2590	FT	0.04	111	21.12			0.36		$2,340		$960		$3,300
D	9. Install wire term. 600v, 1/c #12	56	EA	0.20	13	21.12			0.20		$270		$10		$280
	Product Recycle - 26														
D	1. Install 480v, mtr. flex cond. up to 10hp	3	EA	12.9	46	21.12			181.00		$970		$560		$1,530
D	2. Install 480v, mtr. flex cond. 100hp	1	EA	10.1	12	21.12			187.00		$250		$190		$440
D	3. Install starter & fused disc. switch	4	EA	2.30	11	21.12			120.00		$230		$490		$720
D	4. Install 3/4" conduit galv. rigid stl.	1400	FT	0.08	133	21.12			0.95		$2,810		$1,360		$4,170
D	5. Install 1-1/2" conduit galv. rigid stl.	350	FT	0.14	58	21.12			2.30		$1,220		$830		$2,050
D	6. Install 3/4" "L" ftg. w/cover & gasket	28	EA	1.00	33	21.12			9.90		$700		$280		$980
D	7. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	21.12			27.00		$360		$190		$550
D	8. Install 3/4" conduit union "UNY"	12	EA	0.80	11	21.12			7.90		$230		$100		$330
D	9. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	10. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120

000264

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	16. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	17. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	19. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	20. Install cntrl. wire 600v, 3 #14	1480	FT	0.03	47	21.12			0.21		$990		$320		$1,310
D	21. Install power wire 3#12 w/ #12 grd.	1110	FT	0.04	47	21.12			0.36		$990		$410		$1,400
D	23. Install power wire 3#2/0 w/ #4 grd.	370	FT	0.11	50	21.12			3.18		$1,060		$1,210		$2,270
D	25. Install wire term. 600v, 1/c #14	24	EA	0.20	6	21.12			0.20		$130				$130
D	26. Install wire term. 600v, 1/c #12	18	EA	0.20	4	21.12			0.25		$80				$80
D	29. Install wire term. 600v, 1/c #4	2	EA	0.40	1	21.12			1.20		$20				$20
D	30. Install wire term. 600v, 1/c #2/0	6	EA	0.80	6	21.12			3.20		$130		$20		$150
D	31. Install mtr. cont. kit, 600V, #14-#10	3	EA	0.50	2	21.12			12.00		$40		$40		$80
D	32. Install mtr. cont. kit, 600V, #2- #4/0	1	EA	1.00	1	21.12			31.60		$20		$30		$50
D	34. Install 3/4" conduit galv. rigid stl.	1050	FT	0.08	100	21.12			0.95		$2,110		$1,020		$3,130
D	35. Install 3/4" "L" ftg. w/cover & gasket	30	EA	1.00	36	21.12			9.90		$760		$300		$1,060
D	36. Install 3/4" conduit union "UNY"	14	EA	0.80	13	21.12			7.90		$270		$110		$380
D	37. Install 3/4" conduit seal "EYS"	14	EA	0.90	15	21.12			10.00		$320		$140		$460
D	38. Install 3/4" cond. hub	14	EA	0.80	13	21.12			4.40		$270		$60		$330
D	39. Install power wire 3#12 w/ #12 grd.	700	FT	0.04	30	21.12			0.36		$630		$260		$890
D	40. Install wire term. 600v, 1/c #12	28	EA	0.20	7	21.12			0.20		$150		$10		$160
D	41. Install video cable co-axial	580	FT	0.01	7	21.12			0.21		$150		$120		$270
D	42. Install wire term. cable co-axial	14	EA	0.20	3	21.12			3.00		$60		$40		$100
	High Voltage - 30														
D	30-SG-001Unit substation	1	EA	300.0	356	21.12				150000	$7,520			$153,750	$161,270
D	30-SG-002 Unit Substation	1	EA	290.0	344	21.12				150000	$7,270			$153,750	$161,020
D	30-XT-001 Main Transformer	1	EA												
D	3. Install 3" conduit galv. rigid stl.	60	FT	0.28	20	21.12			6.41		$420		$390		$810
D	4. Install 3" "LBD" ftg. w/cover & gasket	2	EA	4.50	11	21.12			160.50		$230		$330		$560
D	5. Install 3" conduit union "UNY"	2	EA	2.50	6	21.12			76.00		$130		$160		$290
D	7. Install 3" cond. hub	4	EA	2.50	12	21.12			33.30		$250		$140		$390
D	8. Install power wire 3#2/0 w/ #4 grd.	100	FT	0.17	20	21.12			8.11		$420		$830		$1,250
D	9. Install wire term. 600v, 1/c #4	4	EA	0.40	2	21.12			1.30		$40		$10		$50
D	10. Install term. kit 15kv 1/c #2/0	12	EA	3.00	43	21.12			80.00		$910		$980		$1,890
D	Install miscl. mtrl. & support mtrl.	1	EA	8.00	9	21.12			240.00		$190		$250		$440

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8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	480V Distribution - 31														
D	31-MC-001 (MCC)	1	EA	160.00	190	21.12				100000	$4,010			$102,500	$106,510
D	31-MC-002 (MCC)	1	EA	160.00	190	21.12				70000	$4,010			$71,750	$75,760
D	31-MC-003 thru 005 (MCC)	3	EA	160.00	569	21.12				85000	$12,020			$261,380	$273,400
D	31-MC-006 (MCC)	1	EA	160.00	190	21.12				100000	$4,010			$102,500	$106,510
D	Install miscl. mtrl. & support mtrl.	1	LOT	115.00	115	21.12			2759.00		$2,430		$2,830		$5,260
D	2. Install mini-power xfmr/panel, 30kva	9	EA	50.00	534	21.12			3000.00		$11,280		$27,680		$38,960
D	3. Install 3" galv. ridgid stl. conduit	720	FT	0.28	239	21.12			6.41		$5,050		$4,730		$9,780
D	4. Install 3" conduit union "UNY"	18	EA	2.50	53	21.12			76.00		$1,120		$1,400		$2,520
D	5. Install 3" cond. hub	36	EA	2.50	107	21.12			33.30		$2,260		$1,230		$3,490
D	6. Install power wire 3#1/0 grd., 600v	1080	FT	0.20	257	21.12			8.39		$5,430		$9,290		$14,720
D	7. Install 3" "LBD" ftg. w/cover & gasket	18	EA	4.50	96	21.12			160.50		$2,030		$2,960		$4,990
D	8. Install wire term. 600v, 1/c #10	36	EA	0.7	30	21.12			2.75		$630		$100		$730
D	9. Install wire term. 600v, 1/c #350kcm	108	EA	1.50	192	21.12			6.20		$4,060		$690		$4,750
D	10. Install 1-1/2" galv. ridg. stl. conduit	40	FT	0.14	7	21.12			2.30		$150		$90		$240
D	11. Install 1-1/2" "L" ftg. w/ cover & gasket	2	EA	2.00	5	21.12			27.00		$110		$60		$170
D	12. Install 1-1/2" conduit union "UNY"	1	EA	1.50	2	21.12			26.70		$40		$30		$70
D	13. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	14. Install power wire, 600v, 3#4 w/ #8 grd.	60	FT	0.1	5	21.12			1.15		$110		$70		$180
D	15. Install wire term. 600v, 1/c #8	2	EA	0.3	1	21.12			0.90		$20				$20
D	16. Install wire term. 600v, 1/c #4	6	EA	0.4	3	21.12			1.30		$60		$10		$70
D	17. Install 2" conduit union "UNY"	8	EA	1.90	18	21.12			34.40		$380		$280		$660
D	18. Install power wire 3#2/0 w/ #8 grd.	1180	FT	0.53	741	21.12			1.15		$15,650		$1,390		$17,040
D	19. Install 2" conduit hub	8	EA	1.9	18	21.12			11.00		$380		$90		$470
D	20. Install wire term. 600v, 1/c #8	8	EA	0.3	3	21.12			0.90		$60		$10		$70
D	21. Install wire term. 600v, 1/c #4	24	EA	0.4	11	21.12			1.30		$230		$30		$260
D	22. Install 2" pvc sch. 40 conduit	1100	FT	0.1	143	21.12			0.77		$3,020		$870		$3,890
D	23. Install 2" rsg. 90 deg. elbow	8	EA	1.2	11	21.12			69.60		$230		$570		$800
D	24. Install 2" conduit seal "EYS"	4	EA	1.60	8	21.12			30.20		$170		$120		$290
D	25. Install 1-1/2" galv. stl.conduit	1520	FT	0.14	252	21.12			2.30		$5,320		$3,580		$8,900
D	26. Install1-1/2" "L" ftg. w/cover & gasket	62	EA	2.00	147	21.12			27.00		$3,100		$1,720		$4,820
D	27. Install 1-1/2" conduit union "UNY"	22	EA	1.50	39	21.12			26.70		$820		$600		$1,420

000266

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	28. Install 1-1/2" cond. hub	12	EA	1.50	18	21.12			7.90		$380		$100		$480
D	29. Install power wire 3#4 w/ #8 grd.	1640	FT	0.07	132	21.12			1.15		$2,790		$1,930		$4,720
D	30. Install wire term. 600v, 1/c #8	12	EA	0.30	4	21.12			0.90		$80		$10		$90
D	31. Install wire term. 600v, 1/c #4	36	EA	0.40	17	21.12			1.30		$360		$50		$410
D	31. Install machine trenching	211	CY	0.30	75	21.12					$1,580				$1,580
D	32. Install backfill	159	CY	0.40	75	21.12					$1,580				$1,580
D	33. Load, haul & dump	84	CY	0.10	10	21.12					$210				$210
D	34. Install concrete ductbanks, type 23	73	CY	3.80	329	21.12			92.00		$6,950		$6,880		$13,830
	Standby Electrical - 32														
D	1. Install generator 1000kw,(32-eg-001)	1	EA	130.0	154	21.12				100000	$3,250			$102,500	$105,750
D	2. Install trans. switch,(32-ts-001)	1	EA	60.0	71	21.12					$1,500				$1,500
D	3. Install switchgear 2000a bus (32-sg-001)	1	EA	35.0	41	21.12					$870				$870
D	4. Install 3" conduit galv. rigid stl.	510	FT	0.28	169	21.12			6.41		$3,570		$3,350		$6,920
D	5. Install 3" "LBD" ftg. w/cover & gasket	18	EA	4.50	96	21.12			160.00		$2,030		$2,950		$4,980
D	6. Install 3" conduit union "UNY"	9	EA	2.50	27	21.12			76.00		$570		$700		$1,270
D	7. Install 3" cond. hub	18	EA	2.50	53	21.12			33.30		$1,120		$610		$1,730
D	8. Install power wire 3#350kcm w/ #1/0 grd	480	FT	0.20	114	21.12			8.18		$2,410		$4,020		$6,430
D	9. Install wire term. 600v, 1/c #10	12	EA	0.70	10	21.12			2.75		$210		$30		$240
D	10. Install wire term. 600v, 1/c #350kcm	36	EA	1.50	64	21.12			6.20		$1,350		$230		$1,580
D	11. Install power wire 3#500kcm w/ #1/0 grd	210	FT	0.23	57	21.12			11.91		$1,200		$2,560		$3,760
D	12. Install wire term. 600v, 1/c #1/0	6	EA	0.70	5	21.12			2.75		$110		$20		$130
D	13. Install wire term. 600v, 1/c #500kcm	18	EA	1.80	38	21.12			9.30		$800		$170		$970
	Uninterruptible Power - 33														
D	1. Install uninterruptible power sply(up-33-0	1	EA	140.0	166	21.12				33,000	$3,510			$33,830	$37,340
D	2. Install local disc. switch 60a-600v	1	EA	3.5	4	21.12			335.00		$80		$340		$420
D	3. Install 1-1/2" conduit galv. rigid stl.	200	FT	0.14	33	21.12			2.30		$700		$470		$1,170
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	21.12			27.00		$360		$190		$550
D	5. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	6. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	7. Install 1-1/2" cond. hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire 3#4 w/ #8 grd.	215	FT	0.07	17	21.12			1.15		$360		$250		$610
D	9. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	11. Install miscl. mtrl. & support mtrl.	1	LOT	8.00	9	21.12			150.00		$190		$150		$340

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PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
- 2	Lighting - 34														
D	1. Install rnd. stl. pole w/2" tenon	20	EA	12.0	285	21.12			910.00		$6,020		$18,660		$24,680
D	2. Install stl. arm w/fittings	12	EA	4.0	57	21.12			160.00		$1,200		$1,970		$3,170
D	3. Install stl. brkt. for floodlights	17	EA	1.00	20	21.12			90.00		$420		$1,570		$1,990
D	4. Install rdwy. fixt. 400w w/lamp	12	EA	3.60	51	21.12			370.00		$1,080		$4,550		$5,630
D	5. Install fldlght fixt. 250w w/lamp	37	EA	3.30	145	21.12			300.00		$3,060		$11,380		$14,440
D	6. Install 1" pvc sch.40 conduit	2300	FT	0.07	191	21.12			0.37		$4,030		$870		$4,900
D	7. Install 1" rsg conduit elbow	44	EA	0.40	21	21.12			17.50		$440		$790		$1,230
D	8. Install 1" sealing hub	44	EA	0.80	42	21.12			14.60		$890		$660		$1,550
D	9. Install 1-1/2" insult. grd. bushing	44	EA	0.80	42	21.12			12.60		$890		$570		$1,460
D	10. Install #2 grd. wire cont. type "KC"	22	EA	0.50	13	21.12			14.80		$270		$330		$600
D	11. Install str. cu 600v, 3#10 w/ #10 grd.	2500	FT	0.04	130	21.12			0.48		$2,750		$1,230		$3,980
D	12. Install str. cu 600v, 3#12 w/ #12 grd.	800	FT	0.04	34	21.12			0.36		$720		$300		$1,020
D	13. Install mach. trench. for lighting	357	CY	0.30	127	21.12					$2,680				$2,680
D	14. Install mach. excav. for lighting	116	CY	0.50	69	21.12					$1,460				$1,460
D	15. Backfill & compact	381	CY	0.40	181	21.12					$3,820				$3,820
D	16. Load, haul & dump	163	CY	0.10	19	21.12					$400				$400
D	17. Install concrete elect. ductbank	126	CY	3.8	568	21.12			92.00		$12,000		$11,880		$23,880
D	18. Install concrete stl. pole footing	18	CY	16.9	361	21.12			176.00		$7,620		$3,250		$10,870
	Grounding - 35														
D	1. Install grd. well assy.	44	EA	8.0	417	21.12			143.00		$8,810		$6,450		$15,260
D	2. Install grd. test bar assy.	14	EA	7.7	128	21.12			169.00		$2,700		$2,430		$5,130
D	3. Install power transf. grdg.	2	EA	4.00	9	21.12			51.50		$190		$110		$300
D	4. Install switchgear grdg.	2	EA	3.00	7	21.12			56.50		$150		$120		$270
D	5. Install MCC grounding	8	EA	3.00	28	21.12			56.50		$590		$460		$1,050
D	6. Install storage tank grndg.	20	EA	1.00	24	21.12			17.80		$510		$360		$870
D	7. Install vessel or exch. grdg.	2	EA	2.00	5	21.12			25.40		$110		$50		$160
D	8. Install stl. colm. grdg.	102	EA	1.00	121	21.12			17.80		$2,560		$1,860		$4,420
D	9. Install fence post grdg.	6	EA	1.00	7	21.12			57.20		$150		$350		$500
D	10. Install fence gate grdg.	2	EA	3.00	7	21.12			148.80		$150		$310		$460
D	11. Install miscl. equip. grdg.	10	EA	1.00	12	21.12			17.80		$250		$180		$430
D	12. Install #4/0 to #4/0 "T" weld	60	EA	2.00	142	21.12			10.15		$3,000		$620		$3,620
D	13. Install #4/0 to #2 "T" weld	110	EA	2.00	261	21.12			7.55		$5,510		$850		$6,360
D	14. Install 1/c #2 str. cu grd. wire	2500	FT	0.02	53	21.12			0.49		$1,120		$1,260		$2,380

000268

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
. 2															
D	15. Install 1/c #4/o str. cu grd. wire	4500	FT	0.03	160	21.12			1.47		$3,380		$6,780		$10,160
D	16. Install mach. excav. for grd. well	4	CY	0.50	2	21.12					$40				$40
D	17. Install mach. trench. for grd. wire	224	CY	0.3	80	21.12					$1,690				$1,690
D	18. Backfill & compaction	261	CY	0.4	124	21.12					$2,620				$2,620
	Lightning Protection 36														
D	1. Install air term. w/ base 3/8" x 10" rf. mtd	50	EA	1.2	71	21.12			25.00		$1,500		$1,280		$2,780
D	2. Install #2/0 str. cu wire	1800	FT	0.03	53	21.12			0.94		$1,120		$1,730		$2,850
D	3. Install #2/0 - #4/0 "T" exothermic weld	10	EA	2.00	24	21.12			7.55		$510		$80		$590
	Plant & Instrument Air - 40														
D	1. Install mtr. flex cond. conn. assy. 10hp	1	EA	12.9	15	21.12			181.00		$320		$190		$510
D	2. Install mtr. flex cond. conn. assy. 100hp	1	EA	10.10	12	21.12			187.00		$250		$190		$440
D	3. Install 3/4" sealtite flex conmd w/2 conct	2	LOT	0.80	2	21.12			12.05		$40		$20		$60
D	4. Install starter & fused disc. switch	2	EA	2.50	6	21.12			150.00		$130		$310		$440
D	5. Install start-stop button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	6. Install 3/4" conduit galv. stl.	520	FT	0.08	49	21.12			0.95		$1,030		$510		$1,540
D	7. Install 1-1/2" conduit galv. stl.	130	FT	0.14	22	21.12			2.30		$460		$310		$770
D	8. Install 3/4" "L" ftg. w/ cover & gasket	20	EA	1.00	24	21.12			9.90		$510		$200		$710
D	9. Install 1-1/2" "L" ftg. w/ cover & gasket	3	EA	2.00	7	21.12			27.00		$150		$80		$230
D	10. Install 3/4" conduit union "UNY"	8	EA	0.80	8	21.12			7.90		$170		$60		$230
D	11. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	12. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	13. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	14. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	15. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	16. Install cntrl. wire str. cu 3#14	290	FT	0.03	9	21.12			0.21		$190		$60		$250
D	17. Install power wire str. cu 3#12 w/#12grd	435	FT	0.04	19	21.12			0.36		$400		$160		$560
D	18. Install power wire str. cu 3#4/0 w/#4grd.	145	FT	0.11	20	21.12			3.18		$420		$470		$890
D	19. Install wire term. 600v 1/c#14	12	EA	0.20	3	21.12			0.20		$60				$60
D	20. Install wire term. 600v 1/c#12	24	EA	0.20	6	21.12			0.25		$130		$10		$140
D	21. Install wire term. 600v 1/c#4	2	EA	0.40	1	21.12			1.20		$20				$20
D	22. Install wire term. 600v 1/c#2/0	6	EA	0.80	6	21.12			3.20		$130		$20		$150
D	23. Install mtr. cont. kit 600v #14-#10	1	EA	1.00	1	21.12			12.00		$20		$10		$30
D	24. Install mtr. cont. kit 600v #2-#4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50

8113

000249

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Breathing Air System - 41														
D	1. Install mtr. flex cond. assy 50hp	2	EA	15.90	38	21.12			247.00		$800		$510		$1,310
D	2. Install start stop push button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	3. Install 1-1/2" galv. rigid stl. cond.	800	FT	0.14	133	21.12			2.30		$2,810		$1,890		$4,700
D	4. Install 1-1/2" "L" ftg. w/ cover & gasket	16	EA	2.00	38	21.12			27.00		$800		$440		$1,240
D	5. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	6. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	21.12			23.20		$60		$50		$110
D	7. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire str. cu 3#4 w/#8grd.	830	FT	0.07	67	21.12			1.15		$1,420		$980		$2,400
D	9. Install wire term. 600v 1/c#8	4	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v 1/c#4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	11. Install mtr. conn. kit, 600v, #8-#4	2	EA	0.60	1	21.12			21.00		$20		$40		$60
	Product Additive - 44														
D	1. Install mtr. flex cond. conn. assy. 10hp	6	EA	12.9	92	21.12			181.00		$1,940		$1,110		$3,050
D	3. Install 3/4" sealtite flex conmd w/2 conct	4	EA	0.80	4	21.12			12.05		$80		$50		$130
D	4. Install start-stop button station	6	EA	2.30	16	21.12			120.00		$340		$740		$1,080
D	6. Install 3/4" conduit galv. stl.	4400	FT	0.08	417	21.12			0.95		$8,810		$4,280		$13,090
D	8. Install 3/4" "L" ftg. w/ cover & gasket	88	EA	1.00	104	21.12			9.90		$2,200		$890		$3,090
D	10. Install 3/4" conduit union "UNY"	36	EA	0.80	34	21.12			7.90		$720		$290		$1,010
D	12. Install 3/4" conduit seal "EYS"	11	EA	0.90	12	21.12			10.00		$250		$110		$360
D	14. Install 3/4" conduit hub	11	EA	0.80	10	21.12			4.40		$210		$50		$260
D	16. Install cntrl. wire str. cu 3#14	3810	FT	0.03	122	21.12			0.21		$2,580		$820		$3,400
D	17. Install power wire str. cu 3#12 w/#12grd	4570	FT	0.04	195	21.12			0.36		$4,120		$1,690		$5,810
D	19. Install wire term. 600v 1/c#14	36	EA	0.20	9	21.12			0.20		$190		$10		$200
D	20. Install wire term. 600v 1/c#12	62	EA	0.20	15	21.12			0.25		$320		$20		$340
D	23. Install mtr. cont. kit 600v #14-#10	6	EA	0.50	4	21.12			12.00		$80		$70		$150
	Cooling Water - 53														
D	1. Install mtr. flex cond. conn. assy. 5hp	6	EA	12.9	92	21.12			181.00		$1,940		$1,110		$3,050
D	2. Install start-stop button station	8	EA	2.30	22	21.12			120.00		$460		$980		$1,440
D	3. Install 3/4" conduit galv. stl.	2400	FT	0.08	228	21.12			0.95		$4,820		$2,340		$7,160
D	4. Install 1" conduit galv. stl.	700	FT	0.11	91	21.12			1.44		$1,920		$1,030		$2,950
D	5. Install mtr. flex cond. conn. assy. 40hp	2	EA	13.20	31	21.12			164.00		$650		$340		$990
D	6. Install 3/4" "L" ftg w/ cover & gasket	48	EA	1.00	57	21.12			9.90		$1,200		$490		$1,690
D	7. Install 1" "L" ftg w/ cover & gasket	14	EA	1.20	20	21.12			14.50		$420		$210		$630

000270

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	8. Install 3/4" conduit union "UNY"	18	EA	0.80	17	21.12			7.90		$360		$150		$510
D	9. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	10. Install 3/4" conduit seal "EYS"	6	EA	0.90	6	21.12			10.00		$130		$60		$190
D	11. Install 1" conduit seal "EYS"	2	EA	1.00	2	21.12			13.00		$40		$30		$70
D	12. Install 3/4" conduit hub	6	EA	0.80	6	21.12			4.40		$130		$30		$160
D	13. Install 1" conduit hub	2	EA	1.00	2	21.12			5.20		$40		$10		$50
D	14. Install cntrl.wire 600v, 3 #14	3260	FT	0.03	104	21.12			0.21		$2,200		$700		$2,900
D	15. Install power wire 3#12 w/ #12 grd.	2520	FT	0.04	108	21.12			0.36		$2,280		$930		$3,210
D	16. Install power wire 3#6 w/ #8 grd.	740	FT	0.06	52	21.12			0.85		$1,100		$640		$1,740
D	17. Install wire term. 600v, 1/c #14	48	EA	0.20	11	21.12			0.20		$230		$10		$240
D	18. Install wire term. 600v, 1/c #12	48	EA	0.20	11	21.12			0.25		$230		$10		$240
D	19. Install wire term. 600v, 1/c #8	4	EA	0.30	1	21.12			0.90		$20				$20
D	20. Install wire term. 600v, 1/c #6	12	EA	0.40	6	21.12			1.00		$130		$10		$140
D	21. Install mtr. conn. kit, 600v, #14-#10	6	EA	0.50	4	21.12			12.00		$80		$70		$150
D	22. Install mtr. conn. kit, 600v, #8-#4	2	EA	0.60	1	21.12			21.00		$20		$40		$60
	Non-Radioactive Waste System - 61														
D	1. Install motor flex cond. assy. up to 10hp	10	EA	12.9	153	21.12			181.00		$3,230		$1,860		$5,090
D	2. Install start-stop button station sealed	10	EA	2.3	27	21.12			120.00		$570		$1,230		$1,800
D	3. Install 3/4" cond. galv. stl.	3500	FT	0.08	332	21.12			0.95		$7,010		$3,410		$10,420
D	4. Install 3/4" "L" ftg. w/ cover & gasket	70	EA	1.00	83	21.12			9.90		$1,750		$710		$2,460
D	5. Install 3/4" conduit union "UNY"	30	EA	0.80	28	21.12			7.90		$590		$240		$830
D	6. Install 3/4" conduit seal "EYS"	11	EA	0.90	12	21.12			10.00		$250		$110		$360
D	7. Install 3/4" conduit hub	11	EA	0.80	10	21.12			4.40		$210		$50		$260
D	8. Install wire term. 600v, 1/c #12	80	EA	0.20	19	21.12			0.25		$400		$20		$420
D	9. Install wire term. 600v, 1/c #14	60	EA	0.20	14	21.12			0.20		$300		$10		$310
D	10. Install contrl wire str., 600v, 3 #14	3650	FT	0.03	117	21.12			0.21		$2,470		$790		$3,260
D	11. Install power wire, 600v, 3 #12 w/#12grd	3650	FT	0.04	156	21.12			0.36		$3,290		$1,350		$4,640
D	12. Install mtr. connect. kit 600v, #14-#10	10	EA	0.50	6	21.12			12.00		$130		$120		$250
	Radioactive Waste System - 64														
D	1. Install motor flex cond. assy. up to 10hp	14	EA	12.9	214	21.12			181.00		$4,520		$2,600		$7,120
D	2. Install start-stop button station sealed	14	EA	2.3	38	21.12			120.00		$800		$1,720		$2,520
D	3. Install 3/4" cond. galv. stl.	4900	FT	0.08	465	21.12			0.95		$9,820		$4,770		$14,590
D	4. Install 3/4" "L" ftg. w/ cover & gasket	98	EA	1.00	116	21.12			9.90		$2,450		$990		$3,440

00021

8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	5. Install 3/4" conduit union "UNY"	42	EA	0.80	40	21.12			7.90		$840		$340		$1,180
D	6. Install 3/4" conduit seal "EYS"	15	EA	0.90	16	21.12			10.00		$340		$150		$490
D	7. Install 3/4" conduit hub	15	EA	0.80	14	21.12			4.40		$300		$70		$370
D	8. Install wire term. 600v, 1/c #12	112	EA	0.20	27	21.12			0.25		$570		$30		$600
D	9. Install wire term. 600v, 1/c #14	84	EA	0.20	20	21.12			0.20		$420		$20		$440
D	10. Install contrl wire str., 600v, 3 #14	5110	FT	0.03	164	21.12			0.21		$3,460		$1,100		$4,560
D	11. Install power wire, 600v, 3 #12 w/#12grd	5110	FT	0.04	218	21.12			0.36		$4,600		$1,890		$6,490
D	12. Install mtr. connect. kit 600v, #14-#10	14	EA	0.50	8	21.12			12.00		$170		$170		$340
	Product Handling Bldg. HVAC - 73														
D	1. Install 3/4" flex cond. w/ 2 conncectors	1	LOT	0.8	1	21.12			12.05		$20		$10		$30
D	2. Install 3" flex cond. w/ 2 conncectors	7	LOT	3.5	29	21.12			334.00		$610		$2,400		$3,010
D	3. Install mtr. flex cond. assy up to 10hp	3	EA	12.90	46	21.12			181.00		$970		$560		$1,530
D	4. Install starter & fused disc. switch	7	EA	2.30	19	21.12			120.00		$400		$860		$1,260
D	5. Install 3/4" conduit galv. rigid stl.	400	FT	0.08	38	21.12			0.95		$800		$390		$1,190
D	6. Install 1" conduit galv. rigid stl.	2000	FT	0.11	261	21.12			1.44		$5,510		$2,950		$8,460
D	7. Install 3" conduit galv. rigid stl.	2800	FT	0.28	930	21.12			6.41		$19,640		$18,400		$38,040
D	8. Install 3/4" "L" ftg. w/cover & gasket	8	EA	1.00	9	21.12			9.90		$190		$80		$270
D	9. Install 1" "L" ftg. w/cover & gasket	40	EA	1.20	57	21.12			14.50		$1,200		$590		$1,790
D	10. Install 3" "L" ftg. w/cover & gasket	56	EA	4.50	299	21.12			160.00		$6,310		$9,180		$15,490
D	11. Install 3/4" conduit union "UNY"	3	EA	0.80	3	21.12			7.90		$60		$20		$80
D	12. Install 1" conduit union "UNY"	16	EA	1.00	19	21.12			13.40		$400		$220		$620
D	13. Install 3" conduit union "UNY"	21	EA	2.50	62	21.12			76.00		$1,310		$1,640		$2,950
D	14. Install 3/4" conduit seal "EYS"	1	EA	0.90	1	21.12			10.00		$20		$10		$30
D	15. Install 1" conduit seal "EYS"	5	EA	1.00	6	21.12			13.00		$130		$70		$200
D	16. Install 3" conduit seal "EYS"	7	EA	2.10	17	21.12			59.40		$360		$430		$790
D	17. Install 3/4" conduit hub	1	EA	0.80	1	21.12			4.40		$20				$20
D	18. Install 1" conduit hub	5	EA	1.00	6	21.12			5.20		$130		$30		$160
D	19. Install 3" conduit hub	7	EA	2.60	22	21.12			33.30		$460		$240		$700
D	20. Install power wire 3#6 w/ #8 grd.	840	FT	0.07	68	21.12			1.15		$1,440		$990		$2,430
D	21. Install power wire 3#8 w/ #10 grd.	2520	FT	0.05	158	21.12			0.60		$3,340		$1,550		$4,890
D	22. Install power wire 3#1/0 w/ #6 grd.	420	FT	0.11	52	21.12			2.67		$1,100		$1,150		$2,250
D	23. Install power wire 3#2 w/ #8 grd.	420	FT	0.15	73	21.12			5.33		$1,540		$2,290		$3,830
D	24. Install wire term. 600v, 1/c #14	42	EA	0.20	10	21.12			0.20		$210		$10		$220

000272

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	Install miscl. mtrl. & support mtrl.	1	LOT	344.00	344	21.12			8932.00		$7,270		$9,160		$16,430
D	25. Install wire term. 600v, 1/c #12	14	EA	0.20	3	21.12			0.25		$60				$60
D	26. Install wire term. 600v, 1/c #8	46	EA	0.30	16	21.12			0.90		$340		$40		$380
D	27. Install wire term. 600v, 1/c #2	2	EA	0.40	1	21.12			1.00		$20				$20
D	28. Install wire term. 600v, 1/c #1/0	4	EA	0.50	2	21.12			2.45		$40		$10		$50
D	29. Install wire term. 600v, 1/c #250	6	EA	0.70	5	21.12			2.75		$110		$20		$130
D	30. Install wire term. 600v, 1/c #500	6	EA	1.10	8	21.12			4.30		$170		$30		$200
D	31. Install cntrl. wire 600v, 3 #14	2940	FT	0.03	94	21.12			0.21		$1,990		$630		$2,620
D	32. Install mtr. flex cond. assy up to 40hp	2	EA	13.20	31	21.12			164.00		$650		$340		$990
D	33. Install disc. switch, 30a, 600v, fused	1	EA	2.30	3	21.12			150.00		$60		$150		$210
D	34. Install disc. switch, 200a, 600v, fused	2	EA	6.20	15	21.12			510.00		$320		$1,050		$1,370
D	35. Install disc. switch, 400a, 600v, fused	1	EA	8.90	11	21.12			1050.00		$230		$1,080		$1,310
D	36. Install mtr. cont. kit, 600V, #14-#10	5	EA	0.50	3	21.12			12.00		$60		$60		$120
D	37. Install mtr. cont. kit, 600V, #8- #4	2	EA	0.60	1	21.12			21.00		$20		$40		$60
	Analytical Lab. HVAC System - 75														
D	1. Install 3/4" flex cond. w/ 2 conncectors	1	LOT	0.8	1	21.12			12.05		$20		$10		$30
D	2. Install mtr. flex cond. assy. up to 10hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	3. Install 1-1/2" flex cond. w/2 connectors	1	LOT	1.50	2	21.12			35.70		$40		$40		$80
D	4. Install starter & fused disc. switch	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	5. Install 3/4" conduit galv. rigid stl.	750	FT	0.08	71	21.12			0.95		$1,500		$730		$2,230
D	6. Install disc. switch 30a, 600v, fused	1	EA	2.50	3	21.12			150.00		$60		$150		$210
D	7. Install 1-1/2" conduit galv. rigid stl.	250	FT	0.14	41	21.12			2.30		$870		$590		$1,460
D	8. Install 3/4" "L" ftg. w/cover & gasket	15	EA	1.00	18	21.12			9.90		$380		$150		$530
D	9. Install disc. switch 60a, 600v, fused	1	EA	3.50	4	21.12			335.00		$80		$340		$420
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	5	EA	2.00	12	21.12			27.00		$250		$140		$390
D	11. Install 3/4" conduit union "UNY"	6	EA	0.80	6	21.12			7.90		$130		$50		$180
D	12. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	13. Install 3/4" conduit seal "EYS"	3	EA	0.90	3	21.12			10.00		$60		$30		$90
D	14. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	15. Install 3/4" conduit hub	3	EA	0.80	3	21.12			4.40		$60		$10		$70
D	16. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	17. Install cntrl. wire 600v, 3 #14	540	FT	0.03	17	21.12			0.21		$360		$120		$480
D	18. Install power wire 3#8 w/ #10 grd.	270	FT	0.04	12	21.12			0.36		$250		$100		$350

8113

002273

11/05/99

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	19. Install power wire 3#12 w/ #12 grd.	540	FT	0.04	85	21.12			0.36		$1,800		$200		$2,000
D	20. Install power wire 3#1 w/ #6 grd.	270	FT	0.08	25	21.12			1.66		$530		$460		$990
D	21. Install wire term. 600v, 1/c #12	12	EA	0.20	3	21.12			0.25		$60				$60
D	22. Install wire term. 600v, 1/c #10	8	EA	0.20	2	21.12			0.25		$40				$40
D	23. Install wire term. 600v, 1/c #8	2	EA	0.40	1	21.12			1.00		$20				$20
D	24. Install wire term. 600v, 1/c #2	6	EA	0.50	4	21.12			2.45		$80		$20		$100
D	25. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	26. Install mtr. cont. kit, 600V, #14-#10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
	Maint. & Warehouse Fac. HVAC - 76														
D	1. Install 3/4" flex cond. w/ 2 conncectors	8	LOT	0.8	8	21.12			12.05		$170		$100		$270
D	2. Install 1" flex cond. w/ 2 conncectors	7	LOT	1.1	9	21.12			18.50		$190		$130		$320
D	3. Install starter & fused disc. switch	15	EA	4.00	71	21.12			150.00		$1,500		$2,310		$3,810
D	4. Install 3/4" conduit galv.rigid stl	960	FT	0.1	91	21.12			0.95		$1,920		$930		$2,850
D	5. Install 1" conduit galv. rigid stl.	840	FT	0.11	110	21.12			1.44		$2,320		$1,240		$3,560
D	6. Install 3/4" "L" ftg. w/cover & gasket	32	EA	1.00	38	21.12			9.90		$800		$320		$1,120
D	7. Install 1" "L" ftg. w/cover & gasket	28	EA	1.20	40	21.12			14.50		$840		$420		$1,260
D	8. Install 3/4" conduit union "UNY"	16	EA	0.80	15	21.12			7.90		$320		$130		$450
D	9. Install 1" conduit union "UNY"	14	EA	1.00	17	21.12			13.40		$360		$190		$550
D	10. Install 3/4" conduit seal "EYS"	8	EA	0.90	9	21.12			10.00		$190		$80		$270
D	11. Install 1" conduit seal "EYS"	7	EA	1.00	8	21.12			13.00		$170		$90		$260
D	12. Install 3/4" conduit hub	8	EA	0.80	8	21.12			4.40		$170		$40		$210
D	13. Install 1" conduit hub	7	EA	1.00	8	21.12			5.20		$170		$40		$210
D	14. Install power wire 3#6 w/ #8 grd.	950	FT	0.05	60	21.12			0.85		$1,270		$830		$2,100
D	15. Install power wire 3#12 w/ #12 grd.	1100	FT	0.04	47	21.12			0.36		$990		$410		$1,400
D	16. Install wire term. 600v, 1/c #12	64	EA	0.20	15	21.12			0.20		$320		$10		$330
D	17. Install wire term. 600v, 1/c #8	14	EA	0.25	4	21.12			0.90		$80		$10		$90
D	18. Install wire term. 600v, 1/c #6	42	EA	0.35	17	21.12			1.00		$360		$40		$400
	Misc. Facilities HVAC System - 77														
D	1. Install 3/4" flex cond. w/ 2 conncectors	3	LOT	0.8	3	21.12			12.05		$60		$40		$100
D	2. Install starter & fused disc. switch	3	EA	2.50	9	21.12			160.00		$190		$490		$680
D	3. Install 3/4" conduit galv. rigid stl.	1200	FT	0.08	114	21.12			0.95		$2,410		$1,170		$3,580
D	4. Install 3/4" "L" ftg. w/cover & gasket	24	EA	1.00	28	21.12			9.90		$590		$240		$830
D	5. Install 3/4" conduit union "UNY"	10	EA	0.80	9	21.12			7.90		$190		$80		$270
D	6. Install 3/4" conduit seal "EYS"	3	EA	0.90	3	21.12			10.00		$60		$30		$90
D	7. Install 3/4" conduit hub	3	EA	0.80	3	21.12			4.40		$60		$10		$70

00074

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	8. Install power wire 3#12 w/ #12 grd.	1260	FT	0.04	54	21.12			0.36		$1,140		$460		$1,600
D	9. Install wire term. 600v, 1/c #12	24	EA	0.20	6	21.12			0.20		$130				$130
	Maintenance Equipment - 80														
D	1. Install weld recpt. 480v, 60a w/ box	1	EA	6.0	7	21.12			475.00		$150		$490		$640
D	2. Install weld recpt. mtr. assy.	1	EA	3.0	4	21.12			33.00		$80		$30		$110
D	3. Install 3/4" mtr. flex cond. w/ 2 conct.	5	LOT	0.80	5	21.12			12.00		$110		$60		$170
D	4. Install 1" mtr. flex cond. w/ 2 conct.	2	LOT	1.10	3	21.12			18.50		$60		$40		$100
D	5. Install 3/4" conduit galv. rigid stl.	2000	FT	0.08	190	21.12			0.95		$4,010		$1,950		$5,960
D	6. Install 1" conduit galv. rigid stl.	800	FT	0.11	104	21.12			1.44		$2,200		$1,180		$3,380
D	7. Install 1-1/2" conduit galv. rigid stl.	400	FT	0.14	66	21.12			2.30		$1,390		$940		$2,330
D	8. Install 3/4" "L" ftg. w/cover & gasket	40	EA	1.00	47	21.12			9.90		$990		$410		$1,400
D	9. Install 1" "L" ftg. w/cover & gasket	16	EA	1.20	23	21.12			14.50		$490		$240		$730
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	8	EA	2.00	19	21.12			27.00		$400		$220		$620
D	11. Install 3/4" conduit union "UNY"	16	EA	0.80	15	21.12			7.90		$320		$130		$450
D	12. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	13. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	14. Install 3/4" conduit seal "EYS"	6	EA	0.90	6	21.12			10.00		$130		$60		$190
D	15. Install 1" conduit seal "EYS"	2	EA	1.00	2	21.12			13.00		$40		$30		$70
D	16. Install 3" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	17. Install 3/4" conduit hub	6	EA	0.80	6	21.12			4.40		$130		$30		$160
D	18. Install 1" conduit hub	2	EA	1.00	2	21.12			5.20		$40		$10		$50
D	19. Install 1-1/2" conduit hub	1	EA	1.60	2	21.12			7.90		$40		$10		$50
D	20. Install power wire 3#6 w/ #8 grd.	880	FT	0.07	71	21.12			1.15		$1,500		$1,040		$2,540
D	21. Install power wire 3#12 w/ #12 grd.	1260	FT	0.04	54	21.12			0.36		$1,140		$460		$1,600
D	22. Install power wire 3#10 w/ #10 grd.	880	FT	0.04	46	21.12			0.48		$970		$430		$1,400
D	23. Install power wire 3#2 w/ #8 grd.	440	FT	0.08	40	21.12			1.66		$840		$750		$1,590
D	24. Install wire term. 600v, 1/c #14	18	EA	0.20	4	21.12			0.20		$80				$80
D	25. Install wire term. 600v, 1/c #12	24	EA	0.20	6	21.12			0.20		$130				$130
D	26. Install wire term. 600v, 1/c #10	16	EA	0.20	4	21.12			0.25		$80				$80
D	27. Install wire term. 600v, 1/c #8	6	EA	0.30	2	21.12			0.90		$40		$10		$50
D	28. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.00		$130		$10		$140
D	29. Install wire term. 600v, 1/c #2	6	EA	0.50	4	21.12			2.45		$80		$20		$100
D	30. Install disc. switch, 30a, 600v, fused	3	EA	2.50	9	21.12			150.00		$190		$460		$650
D	31. Install disc. switch, 60a, 600v, fused	2	EA	3.50	8	21.12			335.00		$170		$690		$860

000275

- 8113

11/05/99

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	32. Install start-stop button station sealed	2	EA	2.3	5	21.12			120.00		$110		$250		$360
	Remote Handling Equipment - 82														
D	1. Install 3/4" flex cond. w/ 2 conncectors	2	EA	0.8	2	21.12			12.05		$40		$20		$60
D	2. Install starter & fused disc. switch	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	3. Install 3/4" conduit galv. rigid stl.	800	FT	0.08	76	21.12			0.95		$1,610		$780		$2,390
D	4. Install 1" conduit galv. rigid stl.	800	FT	0.11	104	21.12			1.44		$2,200		$1,180		$3,380
D	5. Install 3/4" "L" ftg. w/cover & gasket	16	EA	1.00	19	21.12			9.90		$400		$160		$560
D	6. Install 1" "L" ftg. w/cover & gasket	16	EA	1.20	23	21.12			14.50		$490		$240		$730
D	7. Install 3/4" conduit union "UNY"	6	EA	0.80	6	21.12			7.90		$130		$50		$180
D	8. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	9. Install 3/4" conduit seal "EYS"	2	EA	0.90	2	21.12			10.00		$40		$20		$60
D	10. Install 1" conduit seal "EYS"	2	EA	1.00	2	21.12			13.00		$40		$30		$70
D	11. Install 3/4" conduit hub	2	EA	0.80	2	21.12			4.40		$40		$10		$50
D	12. Install 1" conduit hub	2	EA	1.00	2	21.12			5.20		$40		$10		$50
D	13. Install power wire 3#12 w/ #12 grd.	840	FT	0.04	36	21.12			0.36		$760		$310		$1,070
D	14. Install power wire 3#8 w/ #10 grd.	840	FT	0.05	53	21.12			0.60		$1,120		$520		$1,640
D	15. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	16. Install wire term. 600v, 1/c #12	16	EA	0.20	4	21.12			0.20		$80				$80
D	17. Install wire term. 600v, 1/c #10	4	EA	0.20	1	21.12			0.25		$20				$20
D	18. Install wire term. 600v, 1/c #8	12	EA	0.30	4	21.12			0.90		$80		$10		$90
D	19. Install mtr. cont. kit, 600V, #8-#4	5	EA	0.50	3	21.12			21.00		$60		$110		$170
D	20. Install mtr. flex cond. assy. up to 25hp	2	EA	13.2	31	21.12			164.00		$650		$340		$990
D	21. Install cntrl. wire 600v, 3 #14	840	FT	0.03	27	21.12			0.21		$570		$180		$750
	Radiation Shielding Equipment - 83														
D	1. Install 3/4" flex cond. w/ 2 conncectors	13	LOT	0.8	12	21.12			12.05		$250		$160		$410
D	2. Install starter & fused disc. switch	15	EA	2.50	44	21.12			160.00		$930		$2,460		$3,390
D	3. Install 3/4" conduit galv. rigid stl.	5460	FT	0.08	518	21.12			0.95		$10,940		$5,320		$16,260
D	4. Install 3/4" "L" ftg. w/cover & gasket	117	EA	1.00	139	21.12			9.90		$2,940		$1,190		$4,130
D	5. Install 3/4" conduit union "UNY"	52	EA	0.80	49	21.12			7.90		$1,030		$420		$1,450
D	6. Install 3/4" conduit seal "EYS"	14	EA	0.90	15	21.12			10.00		$320		$140		$460
D	7. Install 3/4" conduit hub	14	EA	0.80	13	21.12			4.40		$270		$60		$330
D	8. Install power wire 3#12 w/ #12 grd.	5720	FT	0.04	244	21.12			0.36		$5,150		$2,110		$7,260
D	9. Install wire term. 600v, 1/c #12	104	EA	0.20	25	21.12			0.20		$530		$20		$550

002276

CONTRACTOR

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	CCTV Systems - 85														
D	1. Install 3/4" conduit galv. rigid stl.	5200	FT	0.08	493	21.12			0.95		$10,410		$5,060		$15,470
D	2. Install 3/4" "L" ftg. w/cover & gasket	104	EA	1.00	123	21.12			9.90		$2,600		$1,060		$3,660
D	3. Install 3/4" conduit union "UNY"	58	EA	0.80	55	21.12			7.90		$1,160		$470		$1,630
D	4. Install 3/4" conduit seal "EYS"	58	FT	0.90	62	21.12			10.00		$1,310		$590		$1,900
D	5. Install 3/4" conduit hub	58	EA	0.80	55	21.12			4.40		$1,160		$260		$1,420
D	6. Install power wire 3#12 w/ #12 grd	3000	FT	0.04	128	21.12			0.36		$2,700		$1,110		$3,810
D	7. Install pan & tilt contl. 600v, 3#14	3000	FT	0.03	96	21.12			0.21		$2,030		$650		$2,680
D	8. Install video cable	3000	FT	0.01	36	21.12			0.21		$760		$650		$1,410
D	9. Install wire term 600v, 1/c#14	156	EA	0.20	37	21.12			0.20		$780		$30		$810
D	10. Install wire term. 600v, 1/c #12	208	FT	0.20	49	21.12			0.25		$1,030		$50		$1,080
D	11. Install wire term. 600v, co-axial cable	52	FT	0.20	12	21.12			3.00		$250		$160		$410
	Distributed Control System - 90														
D	14. Install 1-1/2" galv. rigid stl. conduit	3500	FT	0.14	581	21.12			2.3		$12,270		$8,250		$20,520
D	15. Install 2" galv. rigid stl. conduit	9000	FT	0.17	1814	21.12			3.08		$38,310		$28,410		$66,720
D	16. Install 1-1/2" "L" ftg. w/cover & gasket	105	EA	2.00	249	21.12			27.00		$5,260		$2,910		$8,170
D	17. Install 2" "L" ftg. w/cover & gasket	270	EA	2.50	800	21.12			42.00		$16,900		$11,620		$28,520
D	18. Install 1-1/2" conduit union "UNY"	42	EA	1.50	75	21.12			26.70		$1,580		$1,150		$2,730
D	19. Install 2" conduit union "UNY"	108	EA	1.90	243	21.12			34.40		$5,130		$3,810		$8,940
D	20. Install 1-1/2" conduit seal "EYS"	7	EA	1.40	12	21.12			23.20		$250		$170		$420
D	21. Install 2" conduit seal "EYS"	18	EA	1.60	34	21.12			30.20		$720		$560		$1,280
D	22. Install 1-1/2" conduit hub	14	EA	1.50	25	21.12			7.90		$530		$110		$640
D	23. Install 2" conduit hub	36	EA	1.90	81	21.12			11.00		$1,710		$410		$2,120
D	24. Install 12pr #20 instr. cable, 300v	3640	FT	0.04	155	21.12			1.20		$3,270		$4,480		$7,750
D	25. Install 24pr #20 instr. cable, 300v	9360	FT	0.06	610	21.12			2.10		$12,880		$20,150		$33,030
D	26. Install 1pr-#20 wire termination, 300v	1032	EA	0.40	489	21.12			0.30		$10,330		$320		$10,650
D	27. Install miscl. martl. & support mtrl.	1	LOT	521.0	521	21.12			9915		$11,000		$10,160		$21,160
	Fire Detection & Alarm - 92														
D	1. Install manual smoke detectors	1	LOT	500.0	593	21.12			7000		$12,520		$7,180		$19,700
D	Install miscl. conduit fitting & wires														
	Health Protection - 93														
D	1. Install flex cond. assy. for monitors	28	EA	1.1	37	21.12			14.00		$780		$400		$1,180
D	2. Install stn. stl. box (20" x 20" x 6")	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" cond. galv. stl.	1400	FT	0.08	133	21.12			0.95		$2,810		$1,360		$4,170

00027

81113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	4. Install 1" cond. galv. stl.	220	FT	0.11	29	21.12			1.44		$610		$320		$930
D	5. Install 1-1/2" cond. galv. stl.	170	FT	0.14	28	21.12			2.30		$590		$400		$990
D	6. Install 2" cond. galv. stl.	80	FT	0.17	16	21.12			3.08		$340		$250		$590
D	7. Install 3/4" "L" ftg. w/cover & gasket	46	EA	1.00	55	21.12			9.90		$1,160		$470		$1,630
D	8. Install 1" "L" ftg. w/cover & gasket	6	EA	1.20	9	21.12			14.50		$190		$90		$280
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	6	EA	2.00	14	21.12			27.00		$300		$170		$470
D	10. Install 2" "L" ftg. w/cover & gasket	4	EA	2.50	12	21.12			42.00		$250		$170		$420
D	11. Install 3/4" "T" ftg. w/cover & gasket	33	EA	1.20	47	21.12			11.30		$990		$380		$1,370
D	12. Install 1" "T" ftg. w/cover & gasket	6	EA	1.50	11	21.12			16.60		$230		$100		$330
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	6	EA	2.50	18	21.12			30.30		$380		$190		$570
D	14. Install 2" "T" ftg. w/cover & gasket	4	EA	3.00	14	21.12			46.30		$300		$190		$490
D	15. Install 3/4" conduit union "UNY"	12	EA	0.80	11	21.12			7.90		$230		$100		$330
D	16. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	17. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	18. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	19. Install 1/2" conduit drain	21	EA	0.20	5	21.12			25		$110		$540		$650
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	3500	FT	0.02	75	21.12			0.23		$1,580		$830		$2,410
D	21. Install 1pr-#16 wire termination, 300v	56	EA	0.40	27	21.12			0.30		$570		$20		$590
D	22. Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	23. Install 2" conduit seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
	Power wiring to CAMs														
D	1. Install 3/4" cond. galv. stl.	1300	FT	0.08	123	21.12			0.95		$2,600		$1,270		$3,870
D	2. Install 3/4" GRFX box	28	EA	2.20	73	21.12			32.90		$1,540		$940		$2,480
D	3. Install 3/4" "L" ftg. w/ cover & gasket	42	EA	1.00	50	21.12			9.90		$1,060		$430		$1,490
D	4. Install 3/4" "T" ftg. w/cover & gasket	7	EA	1.20	10	21.12			11.30		$210		$80		$290
D	5. Install 3/4" conduit union "UNY"	16	EA	0.80	15	21.12			7.90		$320		$130		$450
D	6. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	7. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	8. Install power wire 2#12 w/ #12 grd.	1900	FT	0.03	61	21.12			0.27		$1,290		$530		$1,820
D	9. Install wire term. 600v, 1/c #12	100	EA	0.20	24	21.12			0.25		$510		$30		$540
D	10. Install miscl. martl. & support mtrl.	1	LOT	82.0	82	21.12			1177		$1,730		$1,210		$2,940

002078

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Product Additive Sys.44														
D	1. Install flex cond. assy. for monitors	96	EA	1.1	125	21.12			14.00		$2,640		$1,380		$4,020
D	2. Install stn. stl. box (20" x 20" x 6")	5	EA	10.3	61	21.12			630.00		$1,290		$3,230		$4,520
D	3. Install 3/4" cond. galv. stl.	1700	FT	0.08	161	21.12			0.95		$3,400		$1,660		$5,060
D	4. Install 1" cond. galv. stl.	400	FT	0.11	52	21.12			1.44		$1,100		$590		$1,690
D	5. Install 1-1/2" cond. galv. stl.	360	FT	0.14	60	21.12			2.30		$1,270		$850		$2,120
D	6. Install 2" cond. galv. stl.	160	FT	0.17	32	21.12			3.08		$680		$510		$1,190
D	7. Install 3/4" "L" ftg. w/cover & gasket	72	EA	1.00	85	21.12			9.90		$1,800		$730		$2,530
D	8. Install 1" "L" ftg. w/cover & gasket	16	EA	1.20	23	21.12			14.50		$490		$240		$730
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	16	EA	2.00	38	21.12			27.00		$800		$440		$1,240
D	10. Install 2" "L" ftg. w/cover & gasket	6	EA	2.50	18	21.12			42.00		$380		$260		$640
D	11. Install 3/4" "T" ftg. w/cover & gasket	82	EA	1.20	117	21.12			11.30		$2,470		$950		$3,420
D	12. Install 1" "T" ftg. w/cover & gasket	16	EA	1.50	28	21.12			16.60		$590		$270		$860
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	16	EA	2.50	47	21.12			30.30		$990		$500		$1,490
D	14. Install 2" "T" ftg. w/cover & gasket	16	EA	3.00	57	21.12			46.30		$1,200		$760		$1,960
D	15. Install 3/4" conduit union "UNY"	28	EA	0.80	27	21.12			7.90		$570		$230		$800
D	16. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	17. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	18. Install 2" conduit union "UNY"	10	EA	1.90	23	21.12			34.40		$490		$350		$840
D	19. Install 1/2" conduit drain	60	EA	0.20	14	21.12			25		$300		$1,540		$1,840
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	9800	FT	0.02	209	21.12			0.23		$4,410		$2,310		$6,720
D	21. Install 1pr-#16 wire termination, 300v	192	EA	0.40	91	21.12			0.30		$1,920		$60		$1,980
D	22. Install 2" conduit hub	5	EA	1.90	11	21.12			11.00		$230		$60		$290
D	23. Install 2" conduit seal "EYS"	7	EA	1.60	13	21.12			30.20		$270		$220		$490
D	24. Install miscl. martl. & support mtrl.	1	LOT	191.0	191	21.12			2796		$4,030		$2,870		$6,900
	Radon Control Sys.20														
D	11. Install 3/4" "T" ftg. w/cover & gasket	44	EA	1.20	63	21.12			11.30		$1,330		$510		$1,840
D	12. Install 1" "T" ftg. w/cover & gasket	8	EA	1.50	14	21.12			16.60		$300		$140		$440
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	8	EA	2.50	24	21.12			30.30		$510		$250		$760
D	14. Install 2" "T" ftg. w/cover & gasket	8	EA	3.00	28	21.12			46.30		$590		$380		$970
D	19. Install 1/2" conduit drain	28	EA	0.20	7	21.12			25		$150		$720		$870
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	3900	FT	0.02	83	21.12			0.23		$1,750		$920		$2,670
D	21. Install 1pr-#16 wire termination, 300v	76	EA	0.40	36	21.12			0.30		$760		$20		$780
D	22. Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Cooling Water Sys.53														
D	1. Install flex cond. assy. for monitors	4	EA	1.1	5	21.12			14.00		$110		$60		$170
D	2. Install stn. stl. box (20" x 20" x 6")	1	EA	10.3	12	21.12			630.00		$250		$650		$900
D	3. Install 3/4" cond. galv. stl.	100	FT	0.08	9	21.12			0.95		$190		$100		$290
D	4. Install 1" cond. galv. stl.	40	FT	0.11	5	21.12			1.44		$110		$60		$170
D	7. Install 3/4" "L" ftg. w/cover & gasket	4	EA	1.00	5	21.12			9.90		$110		$40		$150
D	8. Install 1" "L" ftg. w/cover & gasket	2	EA	1.20	3	21.12			14.50		$60		$30		$90
D	11. Install 3/4" "T" ftg. w/cover & gasket	2	EA	1.20	3	21.12			11.30		$60		$20		$80
D	12. Install 1" "T" ftg. w/cover & gasket	2	EA	1.50	4	21.12			16.60		$80		$30		$110
D	15. Install 3/4" conduit union "UNY"	2	EA	0.80	2	21.12			7.90		$40		$20		$60
D	16. Install 1" conduit union "UNY"	2	EA	1.00	2	21.12			13.40		$40		$30		$70
D	11. Install 3/4" "T" ftg. w/cover & gasket	2	EA	1.20	3	21.12			11.30		$60		$20		$80
D	12. Install 1" "T" ftg. w/cover & gasket	2	EA	1.50	4	21.12			16.60		$80		$30		$110
D	19. Install 1/2" conduit drain	2	EA	0.20		21.12			25				$50		$50
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	400	FT	0.02	9	21.12			0.23		$190		$90		$280
D	21. Install 1pr-#16 wire termination, 300v	8	EA	0.40	4	21.12			0.30		$80				$80
	Product Handling Bldg. HVAC Sys.73														
D	1. Install flex cond. assy. for 50hp	2	EA	15.9	38	21.12			247.00		$800		$510		$1,310
D	2. Install 1-1/2" cond. galv. stl.	1200	FT	0.14	199	21.12			2.30		$4,200		$2,830		$7,030
D	3. Install 2" cond. galv. stl.	400	FT	0.17	81	21.12			3.08		$1,710		$1,260		$2,970
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	24	EA	2.00	57	21.12			27.00		$1,200		$660		$1,860
D	5. Install 2" "L" ftg. w/cover & gasket	8	EA	2.50	24	21.12			42.00		$510		$340		$850
D	6. Install 1-1/2" conduit union "UNY"	10	EA	1.50	18	21.12			26.70		$380		$270		$650
D	7. Install 2" conduit union "UNY"	3	EA	1.90	7	21.12			34.40		$150		$110		$260
D	8. Install 1-1/2" conduit seal "EYS"	3	EA	1.40	5	21.12			23.20		$110		$70		$180
D	9. Install 2" conduit seal "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	10. Install 1-1/2" conduit hub	3	EA	1.50	5	21.12			7.90		$110		$20		$130
D	11. Install 2" conduit hub	1	EA	1.90	2	21.12			11.00		$40		$10		$50
D	12. Install power wire 3#350kcm w/ #1/0 grd	2940	FT	0.20	701	21.12			8.18		$14,810		$24,650		$39,460
D	13. Install wire term. 600v, 1/c #350 kcm	42	EA	1.50	75	21.12			6.20		$1,580		$270		$1,850

000280

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	Install miscl. martl. & support mtrl. sys. 20	1	LOT	231.0	231	21.12			3329		$4,880		$3,410		$8,290
D	Install miscl. martl. & support mtrl. sys. 23	1	LOT	49.0	49	21.12			693		$1,030		$710		$1,740
D	Install miscl. martl. & support mtrl. sys. 25	1	LOT	53.0	53	21.12			986		$1,120		$1,010		$2,130
D	Install miscl. martl. & support mtrl. sys. 26	1	LOT	67.0	67	21.12			942		$1,420		$970		$2,390
D	Install miscl. martl. & support mtrl. sys. 43	1	LOT	43.0	43	21.12			1232		$910		$1,260		$2,170
D	Install miscl. martl. & support mtrl. sys. 36	1	LOT	37.0	37	21.12			791		$780		$810		$1,590
D	Install miscl. martl. & support mtrl. sys. 40	1	LOT	19.0	19	21.12			302		$400		$310		$710
D	Install miscl. martl. & support mtrl. sys. 41	1	LOT	30.0	30	21.12			519		$630		$530		$1,160
D	Install miscl. martl. & support mtrl. sys. 53	1	LOT	82.0	82	21.12			1129		$1,730		$1,160		$2,890
D	Install miscl. martl. & support mtrl. sys. 61	1	LOT	82.0	82	21.12			1075		$1,730		$1,100		$2,830
D	Install miscl. martl. & support mtrl. sys. 64	1	LOT	116.0	116	21.12			1505		$2,450		$1,540		$3,990
D	Install miscl. martl. & support mtrl. sys. 75	1	LOT	27.0	27	21.12			422		$570		$430		$1,000
D	Install miscl. martl. & support mtrl. sys. 76	1	LOT	48.0	48	21.12			755		$1,010		$770		$1,780
D	Install miscl. martl. & support mtrl. sys. 77	1	LOT	24.0	24	21.12			308		$510		$320		$830
D	Install miscl. martl. & support mtrl. sys. 80	1	LOT	80.0	80	21.12			1188		$1,690		$1,220		$2,910
D	Install miscl. martl. & support mtrl. sys. 82	1	LOT	41.0	41	21.12			543		$870		$560		$1,430
D	Install miscl. martl. & support mtrl. sys. 83	1	LOT	111.0	111	21.12			1402		$2,340		$1,440		$3,780
D	Install miscl. martl. & support mtrl. sys. 85	1	LOT	110.0	110	21.12			1282		$2,320		$1,310		$3,630
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		61,325	$21.12					$1,294,900		$907,700	$982,000	$3,184,600

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PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Instrumentation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	SYSTEM 15														
D	1. Install Feed Preparation system	1	LOT	1266.0	1501	21.12			156672		$31,700		$160,590		$192,290
	SYSTEM 17														
D	1. Install pneumatic actuated valves	2	EA	31.0	74	21.12			6584		$1,560		$13,500		$15,060
D	2. Install flow indicator	1	EA	8.0	9	21.12			809		$190		$830		$1,020
D	3. Install flow transmiiter/sensor	1	EA	18.0	21	21.12			7215		$440		$7,400		$7,840
D	4. Install pressure control valve	1	EA	40.0	47	21.12			18000		$990		$18,450		$19,440
D	5. Install instr. piping for valves	2	EA	12.0	28	21.12			230		$590		$470		$1,060
D	6. Install instr. piping for transmitter	4	EA	6.0	28	21.12			78		$590		$320		$910
D	7. Install instr. piping for flow trans.	1	EA	12.0	14	21.12			284		$300		$290		$590
D	8. Install pressure switch	4	EA	10.0	47	21.12			1400		$990		$5,740		$6,730
	SYSTEM 18														
D	1. Install pneumatic actuated valves	1	EA	22.0	26	21.12			2374		$550		$2,430		$2,980
D	2. Install pneumatic actuated valve 6"	2	EA	13.0	31	21.12			1268		$650		$2,600		$3,250
D	3. Install pneumatic actuated valve 4"	2	EA	6.0	14	21.12			1032		$300		$2,120		$2,420
D	4. Install flow control valve	1	EA	6.0	7	21.12			1750		$150		$1,790		$1,940
D	5. Install level switches	12	EA	17.0	242	21.12			785		$5,110		$9,660		$14,770
D	6. Install level transmitter	4	EA	13.0	62	21.12			3153		$1,310		$12,930		$14,240
D	7. Install ph element/ transmitter	2	EA	26.0	62	21.12			1200		$1,310		$2,460		$3,770
D	8. Install temperature indicator/ transmitter	4	EA	11.0	52	21.12			940		$1,100		$3,850		$4,950
D	9. Install instr. piping for valves	18	EA	11.5	245	21.12			230		$5,170		$4,240		$9,410
D	10. Install process pipe for level trans.	4	EA	3.0	14	21.12			92		$300		$380		$680
D	11. Install instr. pipe for flow transmitter	6	EA	12.0	85	21.12			284		$1,800		$1,750		$3,550
D	12. Install pressure indicator	12	EA	2.0	28	21.12			230		$590		$2,830		$3,420
D	13. Install temperature indicator	10	EA	4.0	47	21.12			175		$990		$1,790		$2,780
D	14. Install flow indicator	1	EA	8.0	9	21.12			4385		$190		$4,490		$4,680
D	15. Install flow indicator	1	EA	8.0	9	21.12			1905		$190		$1,950		$2,140
D	16. Install flow transmitter/sensor	6	EA	18.0	128	21.12			7215		$2,700		$44,370		$47,070
D	17. Install level control valve	4	EA	9.0	43	21.12			3750		$910		$15,380		$16,290
D	18. Install isokinetic air sampler	1	EA	60.0	71	21.12			30000		$1,500		$30,750		$32,250

002082

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Instrumentation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	SYSTEM 18														
D	19. Install spring relief valve 24"	1	EA	42.0	50	21.12			40000		$1,060		$41,000		$42,060
D	20. Install instr. piping for valves	5	EA	12.0	71	21.12			230		$1,500		$1,180		$2,680
D	21. Install instr. piping for transmitter	4	EA	6.0	28	21.12			78		$590		$320		$910
D	Radon Control System - 20	1	LOT	535.0	634	21.12			78073		$13,390		$80,020		$93,410
	SYSTEM 44														
D	1. Install pneumatic act. valve	4	EA	6.0	28	21.12			1032		$590		$4,230		$4,820
D	2. Install bindicator level switch	15	EA	11.0	196	21.12			900		$4,140		$13,840		$17,980
D	3. Install level switch high	1	EA	17.0	20	21.12			785		$420		$800		$1,220
D	4. Install level switch high high	3	EA	17.0	60	21.12			900		$1,270		$2,770		$4,040
D	5. Install allow. for instr. piping	4	EA	12.0	57	21.12			230		$1,200		$940		$2,140
	SYSTEM 53														
D	1. Install pressure indicator	2	EA	4.0	9	21.12			230		$190		$470		$660
D	2. Install temp. transmitter	1	EA	11.0	13	21.12			940		$270		$960		$1,230
	SYSTEM 90														
D	1. Install distrib. control system	1	EA	225.0	267	21.12			282000		$5,640		$289,050		$294,690
D	2. Install control software	1	EA						126500				$129,660		$129,660
	SYSTEM 92														
D	1. Install fire alarm & excav. system	1	EA	150.0	178	21.12			30000		$3,760		$30,750		$34,510
	SYSTEM 93														
D	1. Install real time SOx monitor	1	EA	12.0	14	21.12			12650		$300		$12,970		$13,270
D	2. Install hps control station	1	EA	18.0	21	21.12			27000		$440		$27,680		$28,120
D	3. Install auto radio counter	2	EA	24.0	57	21.12			36000		$1,200		$73,800		$75,000
D	5. Install radon working lvl monitor	9	EA	12.0	128	21.12			11000		$2,700		$101,480		$104,180
D	6. Install body frisker	3	EA	20.0	71	21.12			42000		$1,500		$129,150		$130,650
D	7. Install air sampling station (CAM)	12	EA	4.0	57	21.12			1900		$1,200		$23,370		$24,570
D	8. Install tool comtam. monitor	2	EA	20.0	47	21.12			19000		$990		$38,950		$39,940
D	9. Install isokinetic air sampler	2	EA	60.0	142	21.12			30000		$3,000		$61,500		$64,500
	[redacted]														
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		5,092	$21.11					$107,500		1,418,300		$1,525,800

002283

81113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	800 - Paint / Insulation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	1. Paint steel	126075	SF	0.02	2242	22.18			0.11		$49,730		$14,210		$63,940
D	2. Paint gyp board	27720	SF	0.01	394	22.18			0.09		$8,740		$2,560		$11,300
D	3. Paint single doors	66	EA	2.7	211	22.18			5.85		$4,680		$400		$5,080
D	4. Paint double door	29	EA	5.4	186	22.18			11.7		$4,130		$350		$4,480
D	5. Coat masonry	171135	SF	0.02	4058	22.18			0.39		$90,010		$68,410		$158,420
D	8. Paint equipment	11450	SF	0.02	204	22.18					$4,520				$4,520
D	1. Painting bulks	1	LOT	2915	3456	22.18			16160		$76,650		$16,560		$93,210
D	2. Insulation bulks	1	LOT	5220	6189	22.18			75400		$137,270		$77,290		$214,560
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		16,940	$22.18					375,700		179,800		$555,500

000284

11/05/99

CONTRACTOR

RISK ANALYSIS INPUT DATA TABLE

Capital Combustion (other) Vit 1

Estimate No.:C4981001

8113

Item No.	Cost Element Description	Estimated Base $	Distribution Range Width Low %	Low $	High %	High $	Dist. Type	Corr. Rank
01	cost element # 01	$483,330	-4%	$463,997	45%	$700,829	U	-
02	cost element # 02	$154,070	-2%	$150,989	25%	$192,588	U	-
03	cost element # 03	$73,670	-2%	$72,197	25%	$92,088	U	-
04	cost element # 04	$6,871,060	-3%	$6,664,928	40%	$9,619,484	U	-
05	cost element # 05	$2,418,670	-2%	$2,370,297	20%	$2,902,404	U	-
06	cost element # 06	$960,940	-2%	$941,721	25%	$1,201,175	U	-
07	cost element # 07	$1,400,730	-2%	$1,372,715	20%	$1,680,876	U	-
08	cost element # 08	$2,052,100	-2%	$2,011,058	30%	$2,667,730	U	-
09	cost element # 09	$2,089,240	-1%	$2,068,348	20%	$2,507,088	U	-
10	cost element # 10	$1,580,270	-2%	$1,548,665	35%	$2,133,365	U	-
11	cost element # 11	$19,215,930	-3%	$18,639,452	40%	$26,902,302	U	-
12	cost element # 12	$1,105,440	-1%	$1,094,386	20%	$1,326,528	U	-
13	cost element # 13	$741,450	-1%	$734,036	25%	$926,813	U	-
14	cost element # 14	$3,105,950	-1%	$3,074,891	20%	$3,727,140	U	-
15	cost element # 15	$1,223,600	-1%	$1,211,364	20%	$1,468,320	U	-
16	cost element # 16	$1,348,150	-3%	$1,307,706	40%	$1,887,410	U	-
17	cost element # 17	$269,220	-1%	$266,528	15%	$309,603	U	-
18	cost element # 18	$2,013,020	0%	$2,013,020	25%	$2,516,275	U	-
19	cost element # 19	$940,900	0%	$940,900	15%	$1,082,035	U	-
20	cost element # 20	$255,190	-1%	$252,638	15%	$293,469	U	-
21	cost element # 21	$326,820	0%	$326,820	15%	$375,843	U	-
22	cost element # 22	$167,200	-1%	$165,528	15%	$192,280	U	-
23	cost element # 23	$150,260	-2%	$147,255	20%	$180,312	U	-
24	cost element # 24	$806,530	-1%	$798,465	15%	$927,510	U	-
25				$0		$0		
26				$0		$0		
27				$0		$0		
28				$0		$0		
29				$0		$0		
30				$0		$0		
31				$0		$0		
32				$0		$0		
33				$0		$0		
34				$0		$0		
35				$0		$0		
36				$0		$0		
37				$0		$0		
38				$0		$0		
39				$0		$0		
40				$0		$0		
41				$0		$0		
42				$0		$0		
43				$0		$0		
44				$0		$0		
45				$0		$0		
Total	Capital Combustion (other) Vit 1	$49,753,740		$48,637,900		$65,813,464		

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COST IMPA MATRIX SHEET

Estimate No.: C4981001
Project: Silos 1 & 2 Combustion Vitrify (FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 05-Nov-99
Estimator: J. ELLIS
Location: Fernald

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Civil & Excav. All Facilities						Concrete All Facilities				Structural Steel - All Facilities	
$49,967,400	Labor		Material		PPE(Material)		Labor		Material		Labor	
Cost Drivers	Base $	$483,290	Base $	$154,090	Base $	$73,670	Base $	$6,870,520	Base $	$2,419,020	Base $	$960,860
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	15%					-1%	15%			-1%	15%
Material Pricing			-1%	10%	-1%	15%			-1%	10%		
Contamination	-1%	10%					-1%	10%				
Technology												
Regulations/Laws					-1%	10%						
Quantity Variation	-1%	10%	-1%	15%			0%	10%	-1%	10%		
Project Definition	-1%	10%					-1%	5%			-1%	10%
Other												
Range - %	-4%	45%	-2%	25%	-2%	25%	-3%	40%	-2%	20%	-2%	25%
Range - $	$463,958	$700,771	$151,008	$192,613	$72,197	$92,088	$6,664,404	$9,618,728	$2,370,640	$2,902,824	$941,643	$1,201,075
Distribution	UNIFORM		U		U		U		U		UNIFORM	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Structural Steel All Fac.		Arch./Builds./Finishes-All Fac.		Arch./Builds./Finishes-All Fac.		Equipment Systems 15 - 94				Piping	
	Material		Labor		Material		Labor		Equipment		Labor	
Cost Drivers	Base $	$1,400,930	Base $	$2,051,940	Base $	$2,089,540	Base $	$1,580,160	Base $	$19,226,970	Base $	$1,105,350
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			-1%	15%			-1%	20%			-1%	10%
Material Pricing	-1%	10%			0%	10%			-1%	20%		
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	-1%	10%			-1%	10%			-1%	10%	0%	5%
Project Definition			-1%	15%			-1%	15%	-1%	10%	0%	5%
Other												
Range - %	-2%	20%	-2%	30%	-1%	20%	-2%	35%	-3%	40%	-1%	20%
Range - $	$1,372,911	$1,681,116	$2,010,901	$2,667,522	$2,068,645	$2,607,448	$1,548,547	$2,133,203	$18,650,161	$26,917,758	$1,094,297	$1,326,420
Distribution	UNIFORM		U		U		U		U		UNFORM	
Correlation Rank												

Analyst: _____

Client: _____

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COST IMPA. .MATRIX SHEET

Estimate No.: C4981001
Project: Silos 1 & 2 Combustion Vitrify (FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 05-Nov-99
Estimator: J. ELLIS
Location: Fernald

[redacted]	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Piping Material		Electrical Labor		Electrical Material		Electrical Equipment		Instrumentation Labor		Instrumentation Material	
Cost Drivers	Base $	$741,560	Base $	$3,242,690	Base $	$1,288,510	Base $	$1,348,920	Base $	$269,200	Base $	$2,013,320
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			-1%	10%					-1%	10%		
Material Pricing	-1%	15%			-1%	10%	-1%	20%			0%	15%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	10%			0%	10%	-1%	10%			0%	5%
Project Definition			0%	10%			-1%	10%	0%	5%	0%	5%
Other												
Range - %	-1%	25%	-1%	20%	-1%	20%	-3%	40%	-1%	15%	0%	25%
Range - $	$734,144	$926,950	$3,210,263	$3,891,228	$1,275,625	$1,546,212	$1,308,452	$1,888,488	$266,508	$309,580	$2,013,320	$2,516,650
Distribution	UNIFORM		U		U		U		U		UNIFORM	
Correlation Rank												

[redacted]	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Paint / Insulation Labor		Paint / Insulation Material		RCS Building Labor		RCS Building Material		Mobilization Labor		Mobilization S/C	
Cost Drivers	Base $	$940,830	Base $	$255,230	Base $	$326,800	Base $	$167,220	Base $	$150,250	Base $	$806,540
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	0%	10%			0%	10%			-1%	15%	0%	10%
Material Pricing			-1%	10%			-1%	10%				
Contamination												
Technology												
Regulations/Laws												
Quantity Variation												
Project Definition	0%	5%	0%	5%	0%	5%	0%	5%	-1%	5%	-1%	5%
Other												
Range - %	0%	15%	-1%	15%	0%	15%	-1%	15%	-2%	20%	-1%	15%
Range - $	$940,830	$1,081,955	$252,678	$293,515	$326,800	$375,820	$165,648	$192,303	$147,245	$180,300	$798,475	$927,521
Distribution	UNIFORM		U		U		U					
Correlation Rank												

Analyst: _____

Client: _____

11/05/99

CONTRACTOR

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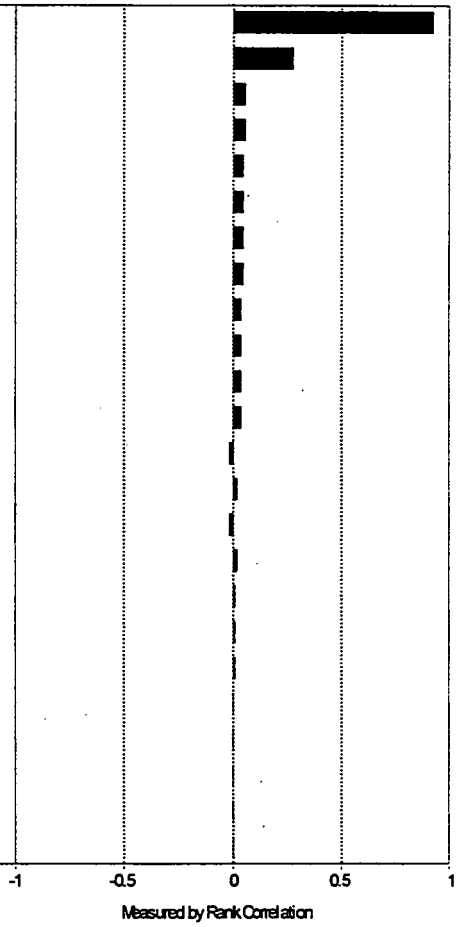
Crystal Ball Report

Sensitivity Chart

Target Forecast: Capital Combustion (other) Vit 1

cost element # 11	.93
cost element # 04	.28
cost element # 09	.06
cost element # 05	.06
cost element # 18	.05
cost element # 13	.05
cost element # 23	.05
cost element # 08	.05
cost element # 16	.04
cost element # 10	.04
cost element # 12	.04
cost element # 01	.04
cost element # 17	-.02
cost element # 07	.02
cost element # 03	-.02
cost element # 14	.02
cost element # 24	.02
cost element # 15	.02
cost element # 06	.01
cost element # 22	-.01
cost element # 20	.00
cost element # 02	.00
cost element # 21	-.00
cost element # 19	.00

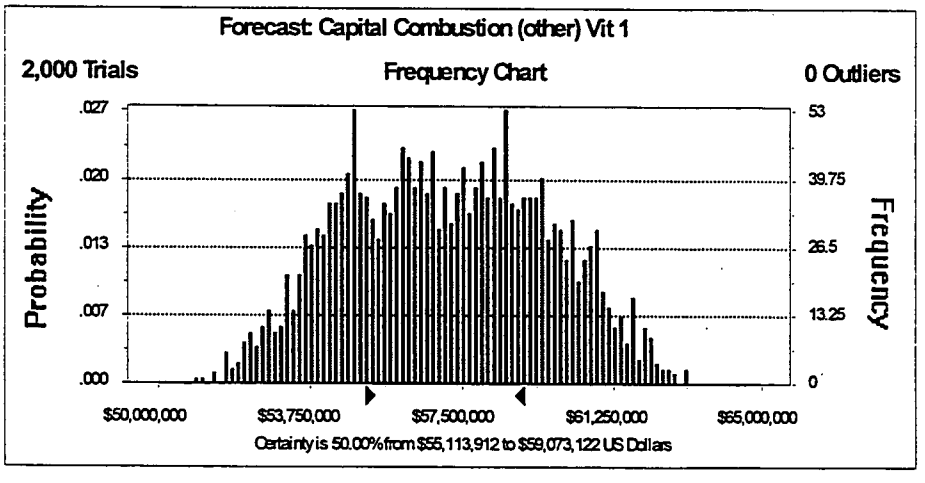


Forecast: Capital Combustion (other) Vit 1 **Cell: C52**

Summary:

Certainty Level is 50.00%
Certainty Range is from $55,113,912 to $59,073,122 US Dollars
Display Range is from $50,000,000 to $65,000,000 US Dollars
Entire Range is from $50,946,681 to $63,087,105 US Dollars
After 2,000 Trials, the Std. Error of the Mean is $55,501

Statistics:	Value
Trials	2000
Mean	$57,147,296
Median	$57,112,901
Mode	---
Standard Deviation	$2,482,090
Variance	6E+12
Skewness	0.03
Kurtosis	2.19
Coeff. of Variability	0.04
Range Minimum	$50,946,681
Range Maximum	$63,087,105
Range Width	$12,140,424
Mean Std. Error	$55,501.22



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Forecast: Capital Combustion (other) Vit 1 (cont'd) **Cell: C52**

Percentiles:

Percentile			US Dollars
0.0%			$50,946,681
2.5%			$52,632,777
5.0%			$53,256,090
50.0%	Risk Budget	14.8%	$57,112,901
95.0%			$61,136,335
97.5%			$61,764,574
100.0%			$63,087,105

End of Forecast

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C.3.3 Engineering Cost Estimate

8113

C.3.3.1 Cost Summary

Engineering cost is the cost of design (preliminary design, detailed design and supporting documentation, and construction field support); it is calculated as an estimated FTE by discipline. The engineering rate of $70.00/mhr is based on a subcontract A/E firm performing the engineering activities.

The engineering cost for the Vitrification — Other facility design and labor support is summarized in **Table C.3.3-1**.

TABLE C. 3.3-1
ENGINEERING COST SUMMARY FOR VITRIFICATION — OTHER

Engineering mhr	357,870
Engineering Labor Rate ($1/mhr)	$70
Estimated Engineering Cost	$25,050,900

C.3.3.2 Attachment

The engineering cost estimate summary by discipline for the Vitrification — Other (VIT2) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.3.3.I

Engineering Cost Estimate Summary for

Vitrification — Other

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
4	Conceptual Design Phase @ 25 wks duration														
	Process Engineer	7	EA	998.4	6989	70.00					$489,220				$489,220
	Mechanical Engineer	4	EA	998.4	3994	70.00					$279,550				$279,550
	Electrical Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Piping Engineer	6	EA	998.4	5990	70.00					$419,330				$419,330
	I & C Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Structural Engineer		EA	998.4		70.00									
	Civil Engineer		EA	998.4		70.00									
	HVAC Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Cost/ Scheduler	3	EA	998.4	2995	70.00					$209,660				$209,660
	Operations Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Clerical Administration	1	EA	998.4	998	16.50					$16,470				$16,470
	Construction Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	TOTAL for Conceptual Design	1	LS		27955						1903460				$1,903,460
	Preliminary Design Phase @ 42 wks duration														
	Process Engineer	12	EA	1685.0	20220	70.00					$1,415,400				$1,415,400
	Mechanical Engineer	8	EA	1685.0	13480	70.00					$943,600				$943,600
	Electrical Engineer	3	EA	1685.0	5055	70.00					$353,850				$353,850
	Piping Engineer	10	EA	1685.0	16850	70.00					$1,179,500				$1,179,500
	I & C Engineer	5	EA	1685.0	8425	70.00					$589,750				$589,750
	Structural Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Civil Engineer	1.5	EA	1685.0	2528	70.00					$176,930				$176,930
	HVAC Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Cost/ Scheduler	6	EA	1685.0	10110	70.00					$707,700				$707,700
	Operations Manager	1	EA	1685.0	1685	70.00					$117,950				$117,950
	Project Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Project Manager	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Clerical Administration	3	EA	1685.0	5055	16.50					$83,410				$83,410
	Construction Engineer	1	EA	1685.0	1685	70.00					$117,950				$117,950
	TOTAL for Preliminary Design	1	LS		98573						6629640				$6,629,640

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81113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
4	Final Design Phase @ 52 wks duration														
	Process Engineer	7	EA	2080.0	14560	70.00					$1,019,200				$1,019,200
	Mechanical Engineer	10	EA	2080.0	20800	70.00					$1,456,000				$1,456,000
	Electrical Engineer	6	EA	2080.0	12480	70.00					$873,600				$873,600
	Piping Engineer	12	EA	2080.0	24960	70.00					$1,747,200				$1,747,200
	I & C Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Structural Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Civil Engineer	2	EA	2080.0	4160	70.00					$291,200				$291,200
	HVAC Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Cost/ Scheduler	8	EA	2080.0	16640	70.00					$1,164,800				$1,164,800
	Operations Manager	2	EA	2080.0	4160	70.00					$291,200				$291,200
	Project Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Project Manager	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Clerical Administration	5	EA	2080.0	10400	16.50					$171,600				$171,600
	Construction Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	TOTAL for Final Design	1	LS		*********						10072400				$10,072,400
	Construction Design Phase @ 134 wks duration														
	Process Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Mechanical Engineer	4	EA	5360.0	21440	70.00					$1,500,800				$1,500,800
	Electrical Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Piping Engineer	2	EA	5360.0	10720	70.00					$750,400				$750,400
	I & C Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Structural Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Civil Engineer		EA	5360.0		70.00									
	HVAC Engineer		EA	5360.0		70.00									
	Cost/ Scheduler	3	EA	5360.0	16080	70.00					$1,125,600				$1,125,600
	Operations Manager		EA	5360.0		70.00									
	Project Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Project Manager	2	EA	5360.0	10720	70.00					$750,400				$750,400
	Clerical Administration	5	EA	5360.0	26800	16.50					$442,200				$442,200
	TOTAL for Construction	1	LS		*********						6445400				$6,445,400
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		390,928	$64.08					25,050,900				$25,050,900

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C.3.4 Operation and Maintenance Estimate Basis: Vitrification — Other

C.3.4.1 Introduction

The O&M costs for the Vitrification — Other (VIT2) alternative are summarized in **Table C.3.4-1**.

The O&M costs were prepared as detailed estimates based on the **Basis of Design and Description (Appendix G)**, POP testing data (**Appendix H**), and O&M experience at the FEMP.

TABLE C. 3.4-1
O&M COST ESTIMATE FOR VITRIFICATION — OTHER

FDF Labor Costs	
FDF O&M Labor Cost	$68,235,440
FDF Start-up Labor Cost	$9,747,920
Material Costs	
Spare Parts Cost	$1,213,600
Consumable (PPE and Supplies) Cost	$9,590,110
Contractor Technical Support Costs	
Contractor Operation Support Cost	$2,159,810
Contractor Start-up Support Cost	$1,154,330
Other Costs	
Secondary Waste	$752,974
Utilities Cost	$4,046,280
Risk Budget	$36,220,046
Total O&M Cost	$ 133,120,500

C.3.4.2 Estimate Basis

The cost estimate basis for the O&M cost for the Vitrification — Other alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.3.4.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY99 dollars.
2. FDF O&M labor is based on the FY99 FAT&LC contract and labor classifications.
3. During operations and start-up, FDF O&M labor is dedicated 100% to supporting the Silos 1 and 2 material full-scale remediation project. All other remediation activities on the site will have been completed in FY06.
4. Labor costs are based on four crews working a 48-hr/week schedule to operate and maintain a 24-hr/day, 7-days/week operation schedule.
5. Silos 1 and 2 material full-scale treatment facility has a designed operational availability of 70%.
6. The O&M staff is 100% dedicated in support of training and start-up of the Silos 1 and 2 material full-scale treatment facility. Training and start-up takes 6 months to complete.
7. Proof of Process testing (surrogate operation) is scheduled for 6 months after completion of start-up and before full-scale operation. The O&M staff is dedicated 100% to supporting the surrogate operations.

Table C.3.4-2 summarizes the labor staffing requirements to support the Vitrification — Other O&M activities. The labor staffing is an activity-based level-of-effort support estimate that was developed using preconceptual design drawings from the **Basis of Design and Description (Appendix G)** and technical judgement of key FDF operations, maintenance, and waste management supervisors.

TABLE C. 3.4-2
OPERATION AND MAINTENANCE LABOR ESTIMATE FOR VITRIFICATION — OTHER

	SHIFT				
POSITION	FIRST	SECOND	THIRD	FOURTH	TOTAL
Plant Manager	1				1
Clerical	0				0
Procurement	1				1
Material Control & Accountability	1	1	1	1	4
Engineering Manager	1				1
Plant Engineer	1				1
Process Engineers	1	1	1	1	4
Waste Planners	3	3	3	3	12
Conduct of Operations	1	1	1	1	4
Safety Manager	1				1
Safety Engineer	1	1	1	1	4
Radiological Technicians	5	5	5	5	20
Industrial Hygiene	1	1	1	1	4
Operations Manager	1				1
Clerical	1				1
Shift Supervisors	2	2	1	1	6
Control Room Operators	4	4	4	4	16
Retrieval Operators	3	3			6
Feed Preparation Operators	3	3	3	4	13
Vitrifier Operator	2	2	2	3	9
Off-gas System Operators	2	2	2	2	8
Container Handlers	3	3	3	3	12
Roving Operators	1	1	1	1	4
Laboratory Technicians	3	3	3	3	12
Motor Vehicle Operators	2	2	2	2	8
Sattelite Clothing Area Ops	3	2			5
Maintenance Manager	1				1
Maintenance Clerical	1				1
Maintenance Supervisors	2	2	1	1	6
Maintenance Planner	2				2
Maintenance Scheduler	1				1
Maintenance Work Order Preparers	2				2
Automated Work Package Programmer	1				1
Electricians	3	3	2	2	10
Mill Wrights	3	3	3	3	12
Instrument Mechanics	3	3	2	2	10
Pipe Fitters	3	3	3	3	12
Welders	2				2
Laborers	2				2
Oiler	1				1
DOP Crew (part-time)	7				7
Measure & Testing Equip. Crew (part-time)	4				4
Crane Crew (part-time)	4				4
Totals	92	54	45	27	238

C.3.4.2.2 Inclusions

The O&M cost estimate includes the following elements:

- Start-up labor;
- O&M labor;
- Proof of process labor;
- Waste packaging labor;
- Start-up, proof of process, and operation consumables;
- Start-up, proof of process, and operation utilities;
- Spare parts;
- O&M of the RCS and the TTA; and
- Silos 1 and 2 material full-scale remediation contractor's technical over sight during start-up, proof of process, and operation activities.

C.3.4.2.3 Exclusions

The O&M elements of cost are excluded from the O&M cost estimate:

- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation project management cost; and
- Cost of FEMP project management oversight.

C.3.4.2.4 Format and Coding

The O&M cost estimates are compiled and summarized into the following cost centers:

- FDF labor,
- FDF O&M labor,
- FDF start-up,
- Material,

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- Spare parts,
- Consumables,
- Utility,
- Contractor's technical support,
- O&M support,
- Start-up support, and
- Risk budget.

The following discussion provides a brief description of the cost centers.

C.3.4.2.4.1 FDF Labor Cost

FDF labor cost includes the costs for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

The FDF labor cost, summarized in **Table C.3.4.-3,** is based on the following:

- FDF O&M labor force in **Table C.3.4-2** operates on a 24-hr/day, 7-day/week schedule;
- 0.5 years of start-up/training that uses the FDF O&M labor force (100% dedication to the project); and
- 4.0 years of O&M labor consisting of 0.5 years of Proof of Process testing and 3.5 years of process operations to treat the Silos 1 and 2 material.

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TABLE C. 3.4-3
SUMMARY OF FDF LABOR COST

Start-up FDF Labor Cost	0.5 years @ $19,495,840	$ 9,747,920
O&M FDF Labor Cost	3.5 years @ $19,495,840	$68,235,440
Total	4.0 years @ $19,495,840	$77,983,360

C.3.4.2.4.2 Material Cost

Material cost includes the costs for consumables (PPE, chemicals, filters office supplies, etc.), and equipment spare and replacement parts.

The following **Table C.3.4-4** is a summary of the annual cost for consumables and spare parts data based on information from the *Vortec POP Final Report* **(Appendix H, Attachment H2)** and the **Basis of Design and Description (Appendix G)**.

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TABLE C. 3.4-4
ANNUAL CONSUMABLE AND SPARE PARTS COST DATA

Spare Parts	$303,400	per year
Consumables		
Glass Additives and supplies	$1,342,528	per year
PPE and supplies	$1,055,000	per year
Total	$2,700,928	per year

Therefore, the total material cost is summarized in **Table C.3.4-5** as follows:

TABLE C. 3.4-5
SUMMARY OF MATERIAL COSTS

Material	Expenditure	Cost
Spare Parts	$303,400 @ 4 years	$1,213,600
Consumables	$2,397,528 @ 4 years	$9,590,110
Total	$2,700,928 @ 4 years	$10,803,710

C.3.4.2.4.3 Utility Cost

Utility cost is the cost for utilities to support the start-up, proof of process, and operation of the Silos 1 and 2 material full-scale remediation activities. This cost includes electricity, natural gas, and oxygen. Cost of water is included in the FEMP site support cost, which is not included in this estimate.

The following **Table C.3.4-6** is a summary of the annual cost for utilities based on information from the *Vortec POP Final Report* **(Appendix H, Attachment H2)** and **the Basis of Design and Description (Appendix G).** Water usage is not addressed in this estimate because water usage is covered in the FEMP site support cost.

TABLE C. 3.4-6
ANNUAL UTILITY COST FOR VITRIFICATION — OTHER

Electrical	14,919,107 kWhr	@ .06 /kWhr	$895,146	per year
Natural Gas	332,640 ccf	@ .35/ccf	$116,424	per year
Total Utilities			$1,011,570	per year

Based on the Vitrification — Other operation and start-up schedule assumptions, the utility costs are summarized in **Table C.3.4-7**.

TABLE C. 3.4-7
UTILITY COST FOR VITRIFICATION — OTHER

O&M	$1,011,570 @ 3.5 years	$ 3,540,495
Start-up and Training	$1,011,570 @ 0.5 years	$ 505,785
Total Utility Cost	$1,011,570 @ 4.0 years	$ 4,046,280

C.3.4.2.4.4 Contractor's Technical Support Cost

Contractor's technical support cost includes the contractor's cost to support start-up and operation of the Silos 1 and 2 material full-scale treatment facility. This cost includes technology-specific laboratory support, training support labor, start-up technical oversight labor, and operational technical oversight labor.

The contractor's estimated technical support cost for Vitrification — Other is based on the *Vortec POP Final Report* **(Appendix H); it is summarized** in **Table C.3.4-8** as follows:

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TABLE C. 3.4-8
CONTRACTOR'S TOTAL TECHNICAL SUPPORT COSTS
VITRIFICATION — OTHER

Contractor Support for O&M	$2,159,810
Contractor Support for Start-up Cost	$1,154,322
Total	$3,314,132

C.3.4.2.4.5 Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the O&M of the Silos 1 and 2 material full-scale treatment facility.

C.3.4.2.4.6 Secondary Waste Cost

Secondary waste cost is defined as those costs accrued for the treatment, sizing, packaging, transportation and disposal of the solid secondary waste generated during Silos 1 and 2 waste remediation operations.

C.3.4.2.5 Methodology

The methods used to prepare the O&M cost estimate are discussed next.

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using the basis of design, preconceptual design drawings, and the technical judgement of senior FDF operation, maintenance, and waste management supervisory personnel. The FY99 plan labor rates were then applied to the estimated labor resources to obtain the FDF O&M labor cost estimate.

Material Cost

The material (consumables and spare parts) cost estimate is based on information provided by the POP contractor's final report.

Utility Cost

The utility cost estimate is based on information provided by the POP contractor's final report.

Contractor's Technical Support Cost

The contractor's technical support cost estimate is based on information provided by the POP contractor's final report.

Risk Budget

Risk budget is the cost allowance for risk and uncertainties associated with the O&M of the Vitrification — Other facility. The risk budget was developed following analyses of probable schedule delays based on technology experience and professional judgement (see **Table C.3.4-9**).

The O&M risk budget for the Vitrification — Other was determined to be 30% of operation, maintenance, and project management cost. The 30% risk factor was calculated based on a schedule impact of 14.3 months resulting from potential schedule delays due to the complexity of start-up, minimal experience with the dryer feed system, and unique spare parts.

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Secondary Waste Cost

The secondary waste cost is estimated as the volume of the spare parts, filter, PPE, and components (i.e., refractory) in contact with the vitrification melt pool being considered mixed waste requiring treatment prior to disposal. The mixed waste is assumed to be packaged, treated and disposed of at a licensed facility, all other secondary waste is packaged and disposed of at the NTS.

TABLE C. 3.4-9
OPERATION AND MAINTENANCE SCHEDULE RISK BUDGET
VITRIFICATION — OTHER (VIT2)

Risk Activity	Schedule Delay of Risk Activity	Probability of Risk Activity
Melter replacement due to melter failure (unique hardware).	Melter replacement 8 months (includes readiness activities).	(40% x 8 = 3.2 months)
Start-up issues	Extended start-up experienced at several sites. Risk of start-up is extended an additional 6 months.	(50% x 6 = 3 months)
Feed Prep System clogging	Feed Prep System clogging (normal flushing and cleaning covered in the normal maintenance).	(50% x 2 = 1 month)
Remote handling issues	Remote handling hardware is not "off-the-shelf" standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Off-gas problems	Replace Off-gas System hardware or regenerate the carbon beds.	(50% x 6 = 3 months)
Reduced waste loading	Reduced waste loading resulting in schedule delay 1.8 months (see details below).	1.8 months
Total		14.3 months

VIT2 Risk Budget Factor

14.3 months of potential delay/48-month operation and start-up period = 30%.
Note: 70% operation availability addresses the minor day-to-day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Schedule Risk Budget

VIT2 assumes a reduction in waste loading from 87 wt% to 75 wt%.
Risk Budget Factor → (87-75 wt%)/75 wt% → 16% @ 30% probability = 5%.
Potential Schedule Delay → 5% x 36 months of operation = 1.8 months.

C.3.4.2.6 References

The following references were used to prepare the O&M cost estimate:

- *Vortec POP Final Report* (**Appendix H, Attachment H2**); and
- **Basis of Design and Description (Appendix G).**

C.3.4.2.7 Attachments

Detailed O&M cost summaries for the Vitrification — Other (VIT2) alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.3.4.I

O&M Cost Estimating Summary for

Vitrification — Other

DETAIL ESTIMATE WORKSHEETS

PROJECT:C4981001
ESTIMATESilos 1 & 2 Combustion Vitrify (FS)
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATJ. ELLIS
LOCATIOFERNALD
TASK NO4S11B

TEM NO.	Operations & Maintenance Manp	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Operations & Maintenance Manpower														
21	Manpower	1	ls	3.50			19,495,840				68,235,440				$68,235,440
26	Spare Parts	1	ls	3.50					303,400				1,061,900		$1,061,900
28	Consumables	1	ls	3.50					1,342,528				4,698,850		$4,698,850
25	Electrical	1	ls	3.50					895,146				3,133,010		$3,133,010
25	Natural Gas	1	ls	3.50					116,424				407,480		$407,480
29	Subcontractor Support	1	ls	1.00				1,439,871				1,439,870			$1,439,870
	O&M Startup Costs														
21	Manpower	1	ls	0.50			19,495,840				9,747,920				$9,747,920
26	Spare Parts	1	ls	0.50					303,400				151,700		$151,700
28	Consumables	1	ls	0.50					1,342,528				671,260		$671,260
25	Electrical	1	ls	0.50					895,146				447,570		$447,570
25	Natural Gas	1	ls	0.50					116,424				58,210		$58,210
29	Subcontractor Support	1	ls	0.50				1,439,871				719,940			$719,940
24	Startup Cost	1	ls	1.00				1,154,332				1,154,330			$1,154,330
22.a	Secondary Waste to OTHER	1	ls									$204,756			$204,756
31	Secondary Waste to NTS	1	ls									$548,218			$548,218

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OPERATIONS AND MAINTENANCE MANPOWER
Vitrification - Other

POSITION	SHIFT FIRST		SHIFT THIRD	SHIFT FOURTH	TOTAL	NO. HRS/WK	TOTAL HOURS	SALARY ($/HR)	ANNUAL EXPENSE
Plant Manager	1				1	40	6240	$60.00	$124,800
Clerical					0	40	0	$23.00	$0
Procurement	1				1	40	6240	$43.50	$90,480
Mat'l Control & Accountability	1	1	1	1	4	48	29952	$41.75	$416,832
							0		
Engineering Manager	1				1	40	6240	$65.00	$135,200
Plant Engineer	1				1	40	6240	$55.00	$114,400
Process Engineers	1	1	1	1	4	48	29952	$55.00	$549,120
Waste Planners	3	3	3	3	12	48	89856	$44.00	$1,317,888
Conduct of Operations	1	1	1	1	4	48	29952	$42.50	$424,320
							0		
Safety Manager	1				1	40	6240	$60.00	$124,800
Safety Engineer	1	1	1	1	4	48	29952	$46.00	$459,264
Radiological Technicians	5	5	5	5	20	48	149760	$33.50	$1,672,320
Industrial Hygiene	1	1	1	1	4	48	29952	$46.00	$459,264
							0		
Operations Manager	1				1	40	6240	$60.00	$124,800
Clerical	1				1	40	6240	$23.00	$47,840
Shift Supervisors	2	2	1	1	6	48	44928	$42.50	$636,480
Control Room Operators	4	4	4	4	16	48	119808	$30.00	$1,198,080
Retrieval Operators	3	3			6	48	44928	$30.00	$449,280
Feed Preparation Operators	3	3	3	4	13	48	97344	$30.00	$973,440
Vitrifier Operator	2	2	2	3	9	48	67392	$30.00	$673,920
Off-gas System	2	2	2	2	8	48	59904	$30.00	$599,040
Container Handlers	3	3	3	3	12	48	89856	$30.00	$898,560
Roving Operators	1	1	1	1	4	48	29952	$29.00	$289,536
Laboratory Technicians	3	3	3	3	12	48	89856	$30.00	$898,560
Motor Vehicle Operators	2	2	2	2	8	48	59904	$30.00	$599,040
Sattelite Clothing Area Ops	3	2			5	48	37440	$30.00	$374,400
							0		
Maintenance Manager	1				1	40	6240	$60.00	$124,800
Clerical	1				1	40	6240	$23.00	$47,840
Maintenance Supervisors	2	2	1	1	6	48	44928	$42.50	$636,480
Maintenance Planner	2				2	40	12480	$42.50	$176,800
Maintenance Scheduler	1				1	40	6240	$42.50	$88,400
CMMS Administrator	1				1	40	6240	$41.00	$85,280
Data Entry Clerk	1				1	40	6240	$23.00	$47,840
Maint Work Order Preparers	2				2	40	12480	$41.00	$170,560
Automated Work Pkg Programmer	1				1	40	6240	$41.00	$85,280
Electricians	3	3	2	2	10	48	74880	$32.00	$798,720
Mill Wrights	3	3	3	3	12	48	89856	$32.00	$958,464
Instrument Mechanics	3	3	2	2	10	48	74880	$32.00	$798,720
Pipe Fitters	3	3	3	3	12	48	89856	$32.00	$958,464
Welders	2				2	40	12480	$32.00	$133,120
Laborers	2				2	40	12480	$30.00	$124,800
Oiler	1				1	40	6240	$32.00	$66,560
DOP Crew (Part Time)	7				7	28	30576	$32.00	$326,144
Meas & Test Equip Crew (Part Time)	4				4	16	9984	$32.00	$106,496
Crane Crew (Part Time)	4				4	16	9984	$32.00	$106,496
Totals	92	#	45	47	238		1,692,012		$19,492,928

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OPERATIONS CONSUMABLES AND MATERIAL COST

Spare Parts	$ 303,400.00	per year
Consumables	$ 1,342,528.00	per year
Health Physics (PPE)	See attached details	

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Operation and Maintenance
PPE and Supplies
Calculations

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

SITE SPECIFIC

EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			70.0%	20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
	<---- MULTIPLE SHIFTS-											
WORK WEEK							4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK	//// MULTIPLE-SHIFT ////			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK							OR					
2ND SHIFT					2ND SHIFT		ONE SHIFT			100.0%	3.0%	0.03
3RD SHIFT			3RD SHIFT				ONLY			100.0%	5.0%	0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	87.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 87.4%

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.14

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EFFICIENCY FACTORS

8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
'ENT: DOE
S NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	14%	14.0
S/T = BASE UNIT MANHOURS		114
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		114
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		114
• PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	4.00%	5	71.00%	81	79.00%	90	147.00%	168	326.00%	372
.S A MULTIPLIER)/TOTAL HRS	1.04	118.6	1.71	194.9	1.79	204.1	2.47	281.6	4.26	485.6
TAL MULTIPLIER w/SITE PROD.	1.1856		1.9494		2.0406		2.8158		4.8564	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

12.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	49.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

JJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-[illegible]
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.04	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR			D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's			600	600	600	600	600
ADDITN'L.SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's		QUANTITY	1	1	1	1	1
		MINUTES	25	25	25	25	25
TOTAL			25	25	25	25	25
PPE DON & DOFFING		QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)		MINUTES	0	15	15	20	25
TOTAL				60	60	80	100
WORK BREAKS		QUANTITY	N/A	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)		MINUTES	N/A	15	15	15	15
TOTAL			0	30	30	30	45
MOBILIZATION - ROUND TRIPS		QUANTITY	N/A	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)		MINUTES	N/A	15	15	15	15
TOTAL			0	60	60	60	60
COOLDOWNS PER DAY		QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS)	33.33%	MINUTES	N/A	15	15	15	15
TOTAL			0	20	20	40	40
AIR TANK REPLACEMENT		QUANTITY	N/A	N/A	N/A	4	4
		MINUTES	N/A	N/A	N/A	10	10
TOTAL			0	0	0	40	40
AVAILABLE WORK TIME			575	405	405	325	290
AVAILABLE WORK TIME FACTOR			0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's . Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

8113

OJECT: SILOS 1 & 2 COMBUSTION VITRIFY (FS)

FLUOR DANIEL FERNALD

ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

CAPITAL - PLANT

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	4	0	$0	C / C+/ B	
SUB-TOTAL		22.18	4		$0		
				$/MD =	$0.00		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	4	0	$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	mC
SUB-TOTAL		5.98	4		$0	
				$/MD =	$0.00	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	48	$3,658	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	48	$39,600	C/B
THERMO STRIPS	EA	50.00	6	48	$14,400	C/B
SUB-TOTAL					$57,660	

MAT'L.$'s
$57,700

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: SILOS 1 & 2 COMBUSTION VITRIFY (FS)

TIMATE NO.: C4981001
.IENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

--MEDICAL MONITORING --
CAPITAL - PLANT

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	175	700	$22.10	$15,470
ANNUAL PHYSICALS	1	4	175	700	$22.10	$15,470
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	175	175	$22.10	$3,870
SUB-TOTAL						$34,810

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	175	1572	$22.10	$34,730
SUB-TOTAL						$34,730

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s	
11	261	2	522	$22.10	$11,500	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	175	0.77	339

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	0.0%	$9,079,893	$0
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	$9,079,893	$181,600

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$262,600	$57,700	$320,300

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ACTIVITY DURATIONS

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)
ESTIMATE NO.: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	18-Dec-96	01-Jan-2000	30-Sep-2000	30-Jun-2001	18.0	MONTHS
					0	MONTHS
TOTAL					18.0	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	45.5	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
		01-Jan-2002	01-Jan-2004	01-Jan-2006	48.1	MONTHS
OPERATIONS					48.1	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

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APPENDIX "E"

HEALTH PHYSICS

8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ESTIMATE NO: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P PLANT OPERATIONS
ITEM NO. 27

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY WKR.SHFT. = 208/WK for 4.00 YR DURATION				
PPE LEVEL C / C+ / B : F/HF M		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	52772	$941,447	C / C+/ B	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	52772	$941,447	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	52772	$50,661	C / C+/ B	
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	52772	$54,883	C / C+/ B	
GLOVE, WORK - DISPOSABL	PR	1.02	4	52772	$215,308	C / C+/ B	
APR CARTRIDGES - DISPOS	PR	11.74	4	52772	$2,478,158	C / C+/ B	
SUB-TOTAL		22.18	4		$4,681,904		
				$/MD =	$88.72		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVER	PR	4.46	4	105543	$1,882,894	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	105543	$101,322	mC
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	105543	$109,765	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	105543	$430,617	mC
SUB-TOTAL		5.98	4		$2,524,598	
				$/MD =	$23.92	

SUBCONTRACTOR REQUIRE	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR	PR	12.70	6	166.73	$12,704	D/C/B
APR w/HALF FACE MASK - (1	EA	22.30	6	83.36	$11,154	C
APR w/FULL FACE MASK - (1	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	41.68	$34,387	C/B
THERMO STRIPS	EA	50.00	6	16.67	$5,002	C/B
SUB-TOTAL					$63,250	

MAT'L.$'s
$7,269,800

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ESTIMATE NO: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

PLANT OPERATIONS
--MEDICAL MONITORING --

ITEM NO. 27

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	175	700	$22.10	$15,470
ANNUAL PHYSICALS	4	4	175	2800	$22.10	$61,880
EXIT (TERMINATION) PHYSIC	1	1	175	175	$22.10	$3,870
SUB-TOTAL						$81,220

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	175	1572	$22.10	$34,730
SUB-TOTAL						$34,730

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	885	2	1770	$22.10	$39,100

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	222	0.97812	905

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY	0.0%	$68,235,440	$0
			LABOR $'s
WORK DELAYS CAUSED BY	1.0%	$68,235,440	$682,400

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$837,500	$7,269,800	$8,107,300

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HEALTH PHYSICS

8113

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ESTIMATE N0C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P PLANT OPERATIONS
ITEM NO. 27

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY WKR.SHFT. = 208/WK for 4.00 YR DURATION				
PPE LEVEL C / C+ / B : F/HF M		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	23379	$417,072	C / C+/ B	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	23379	$417,072	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	23379	$22,443	C / C+/ B	
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	23379	$24,314	C / C+/ B	
GLOVE, WORK - DISPOSABL	PR	1.02	4	23379	$95,384	C / C+/ B	
APR CARTRIDGES - DISPOS	PR	11.74	4	23379	$1,097,854	C / C+/ B	
SUB-TOTAL		22.18	4		$2,074,139		
				$/MD =	$88.72		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVER	PR	4.46	4	46757	$834,145	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	46757	$44,887	mC
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	46757	$48,627	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	46757	$190,769	mC
SUB-TOTAL		5.98	4		$1,118,428	
				$/MD =	$23.92	

SUBCONTRACTOR REQUIRED	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR	PR	12.70	6	165.38	$12,602	D/C/B
APR w/HALF FACE MASK - (1	EA	22.30	6	82.69	$11,064	C
APR w/FULL FACE MASK - (1	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	41.34	$34,109	C/B
THERMO STRIPS	EA	50.00	6	16.54	$4,961	C/B
SUB-TOTAL					$62,740	

MAT'L.$'s
$3,255,300

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Combustion Vitrify (FS)

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ESTIMATE NO: C4981001
CLIENT: DOE
WBS NO.: 2.1.3.G.P

PLANT OPERATIONS
--MEDICAL MONITORING --

ITEM NO. 27

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	221	882	$22.10	$19,490
ANNUAL PHYSICALS	4	4	221	3528	$22.10	$77,970
EXIT (TERMINATION) PHYSIC	1	1	221	221	$22.10	$4,870
SUB-TOTAL						$102,330

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	221	1980	$22.10	$43,760
SUB-TOTAL						$43,760

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	878	2	1756	$22.10	$38,800

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	221	0.9702	905

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY	0.0%	$77,983,360	$0
			LABOR $'s
WORK DELAYS CAUSED BY	1.0%	$77,983,360	$779,800

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$964,700	$3,255,300	$4,220,000

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OPERATIONS UTILITY COST

Electrical	14919107	KW/hr	$	895,146.42	per year	(See Appendix G for details)
Natural Gas	332,640 ccf	35 ccf	$	116,424.00	per year	
Total utility cost per year			$	1,011,570.42	per year	

Estimated Secondary Waste Streams Generated During Full-scale of the Remediation Facility for Silos 1 & 2 Project					
Vitrification - (other) Combustion					
Source	**Material Type**	**Total Volume 3 Years**	**Packaged Disposal Volume in CF**	**Shipped to**	**No. of LMB**
Misc. Replacement Equipment	Solid	410 cf	790	NTS	**1**
PPE	Solid	27,700 cf	41,038	NTS	**41**
Freight per Container to NTS	**$3,453**	**Container(s) to NTS**	42	$145,018	
Container Burial NTS	**$9,600**	**Container(s) Burial NTS**	42	$403,200	
			NTS Total	**$548,218**	
Source	**Material Type**	**Total Volume 3 Years**	**Shipped to**	**Container Type**	**Total Dollars**
Category C (Refractory)	Solid	17,419 kg	other	55 gal drum	$143,605
Category C (HEPA filters)	Solid	6,630 kg	other	B-25 boxes	$61,151
				Other Total	**$204,756**
F:\123R5W\C498101X.WK4					
Total Secondary Waste Cost				**$752,973**	

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VITRIFICATION - OTHER

The Department of Energy Oak Ridge Operations
Mixed Waste Disposal under DOE contract
DE-AC0594OR22074

Disclaimer: This should be used for cost estimation purposes only.

Category C Estimate (REFRACTORY)

Material:	Debris
Weight of Material:	17419 kg
Container Type:	55 Gallon Drums
Treatment Cost:	$98,068.97
Disposal Cost:	$28,767.48
Handling Price:	$4,575.00
Transportation Cost:	$12,193.30

Total: $143,604.75

Category C Estimate - HEPA FILTERS

Material:	Debris
Weight of Material:	6630 kg
Container Type:	B-25 Boxes
Treatment Cost:	$40,310.40
Disposal Cost:	$10,949.45
Handling Price:	$5,250.00
Transportation Cost:	$4,641.00

Total: $61,150.84

VITRIFICATION - OTHER TOTAL $204,755.59

Estimated Secondary Waste Streams Generated During Full-scale Operation of the Remediation Facility for Silos 1 and 2 Project

Secondary Waste Streams for VIT 2					
Source	**Material Type**	**Rate (lb/hr)**	**Total Volume**	**Status**	**Packaged Disposal Volume**
Scrubber Purge	Water	2,712	8,884,512 gal	Process	N/A
RCS Condensate	Water	200	655,200 gal	Process	N/A
Cooling Tower Blow Down	Water	5,000	16,380,000 gal	Process	N/A
Refractory	Solid	1 Lot	225 cf	Dispose	448 cf
Misc. Replacement Equipment [1]	Solid	N/A	410 cf	Dispose	790 cf
RCS carbon	Carbon	1 Lot	8,000 cf	Dispose	13,334 cf
RCS and Off gas system HEPA Filters	Solids	N/A	1,296 cf	Dispose	2,496 cf
PPE [2]	Solid	4/day	27,700 cf	Dispose	41,038 cf
Total Estimated Cubic Feet of Packaged Disposed Secondary Waste					58,000 cf

1 - Equipment will be replaced when necessary to maintain normal operation schedule.
2 - Based on the assumption of four complete changes per person per shift.

Vitrification-Other (VIT 2)

Operation and Maintenance Risk Budget

Risk Activity	Schedule delay of Risk Activity	Probability of Risk Activity
Melter replacement due to melter failure. (unique hardware)	Melter replacement 8 months (includes readiness activities)	(40% x 8= 3.2 months)
Startup Issues	Extended startup experienced at several sites Risk is startup is extended an additional 6 months.	(50% x 6 = 3 months)
Feed prep system clogging	Feed prep system clogging (normal flushing and cleaning covered in the normal maintenance .	(50% x 2 = 1 month)
Remote handling issues	Remote handling hardware is not off-the shelf standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Off-gas problems	Replace off-gas system hardware or regenerate the carbon beds	(50% x 6 = 3 months)
Reduce waste loading	Reduce waste loading resulting in schedule delay 1.8 months see below for details.	1.8 months
Total		14.3 months

Vit 2 Risk Budget Factor

14.3 months of potential delays/48 month operation and startup period = 30%

Note: 70% operation availability addresses the minor day to day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Risk Budget

Vit 2 assume a reduction in waste loading from 87wt% to 75wt%

Risk Budget Factor = 87-75/75 = 16% @ 30% probability = 5%

5% x 36 months of operation = 1.8 months of potential delay.

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C.3.5 Decontamination and Demolition Estimate Basis: Vitrification — Other

C.3.5.1 Introduction

D&D costs for the Vitrification — Other (VIT2) alternative are summarized in **Table C.3.5-1.**

TABLE C. 3.5-1
D&D COST
VITRIFICATION — OTHER

Vitrification — Other D&D Cost	$13,625,100
Silos Project Support Area D&D Cost	$10,468,800
D&D NTS Disposal Cost	$12,710,630
D&D Risk Budget	$ 1,428,300
Total D&D Cost Estimate	$ 38,232,830

C.3.5.2 Estimate Basis

The cost estimate basis for the D&D cost of the Vitrification — Other alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.3.5.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY 1999 dollars.
2. D&D waste is sent to the NTS for disposal.
3. Labor costs are based on four crews working a 40-hr/week, 10-hr/day schedule, without any allowance for premium time.
4. Construction management staff is dedicated 100% to supporting D&D of the proposed facility.

C.3.5.2.2 Inclusions

The D&D cost estimate includes the following elements:

- Cost of demolition labor;
- Cost of FDF construction management dollars above- and below- grade;
- Waste packaging and transportation labor;
- Below-grade D&D of concrete and underground utilities;
- Above-grade D&D;
- RCS/TTA building D&D;
- FDF D&D planning & engineering;
- Equipment rental dollars; and
- Subcontractor staffing costs.

C.3.5.2.3 Exclusions

The D&D cost estimate excludes the following elements:

- Premium time cost for overtime; and
- Security, fire department, human resources, etc.

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C.3.5.2.4 Format and Coding

The D&D cost estimates are compiled and summarized in the following cost centers:

- Vitrification — Other D&D;
- Silos project support area D&D;
- D&D NTS disposal; and
- D&D risk budget.

C.3.5.2.4.1 Vitrification — Other D&D Costs

This is the cost associated with the D&D of the Vitrification — Other facility. This cost estimate is based on the **Basis of Design and Description (Appendix G)** and FEMP D&D experience.

C.3.5.2.4.2 Silos Project Support Area D&D Costs

Silos project support area D&D costs include the costs for the D&D of the silos areas support facilities (TTA, RCS). This cost estimate is based on information from the AWR preconceptual design provided with the contractor's bid, and FEMP D&D experience.

C.3.5.2.4.3 D&D NTS Disposal Costs

D&D NTS disposal costs are the costs for the disposal of all D&D debris from the D&D of the Vitrification — Other facility, the TTA, and RCS.

C.3.5.2.4.4 D&D Risk Budget

The D&D risk budget is a cost allowance for risk and uncertainties with the D&D activities. This risk budget was calculated based on the FEMP D&D project risks using the FEMP cost risk analysis program.

C.3.5.2.5 Methodology

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with D&D of the Silos 1 and 2 material remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates. An activity-based level-of-effort support estimate was developed using preconceptual design drawings and materials of construction from the **Basis of Design and Description (Appendix G)** and technical judgement of senior D&D and waste management and packaging supervisors.

Wage Rates

Wage rates are based on project labor agreement rates, effective October 1998, and are considered FY99 dollars for estimating purposes.

Unit Rates

Unit mhrs, equipment, and material dollars are based on estimating guides and FEMP historical data rates.

Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the D&D of the Silos 1 and 2 material full-scale treatment facility.

C.3.5.2.6 References

Basis of Design and Description (Appendix G).

C.3.5.2.7 Attachment

D&D cost summaries for the Vitrification — Other (VIT2) alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.3.5.I

D&D Cost Estimate Summary for

Vitrification — Other

ESTIMATE SUMMARY SHEET

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
BS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
Mobilization Cost	820		$17,400		$13,800	$800	$32,000
Below Grade	7,690		$155,700				$155,700
Above Grade	43,356		$877,880				$877,880
Demobilization Cost	1,780		$36,400	$8,200	$2,500	$4,900	$52,000
DIRECT FIELD COSTS TOTAL	53,646	$20.27	$1,087,380	$8,200	$16,300	$5,700	$1,117,580
SUPERVISION - CONTRACTOR & PERDIUM	17,920		$427,500	$124,800			$552,300
SMALL TOOLS & CONSUMABLES 3%					$32,600		$32,600
EQUIP. RENTAL (See Equipment Schedule)						$705,600	$705,600
TEMPORARY FACILITIES 6%	1,609		$32,600		$32,600		$65,200
TEMPORARY UTILITY HOOK-UP 3%	1,046		$21,200		$11,400		$32,600
JOB CLEAN-UP 6%	2,414		$48,900		$16,300		$65,200
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)							
HEALTH PHYSICS S/C	2,255		$45,700		$165,500		$211,200
CERCLA - 40 HRs/FTE	1,325		$26,900				$26,900
GET/SITE ACCESS & JOB SPECIFIC TRAINING	954		$19,300				$19,300
PAYROLL BURDENS & BENEFITS 57%	-	-	$974,400				$974,400
OVERHEAD & PROFIT 20%	-	-		$760,600			$760,600
BOND 1%	-	-		$45,600			$45,600
SALES TAX 6%	-	-			$16,500	$42,700	$59,200
INDIRECT FIELD COSTS TOTAL	27,523		$1,596,500	$931,000	$274,900	$748,300	$3,550,700
DIRECT & INDIRECT FIELD COSTS TOTAL	81,169	$33.07	$2,683,880	$939,200	$291,200	$754,000	$4,668,280
WASTE DISPOSITION MGMT. - FD FERNALD			$1,299,358	$2,175,301	$3,180,703	$51,697	$6,707,060
OFF-SITE DISPOSAL COSTS (Commercial)							
WASTE MANAGEMENT COSTS TOTAL			$1,299,358	$2,175,301	$3,180,703	$51,697	$6,707,060
PROJECT CLOSE OUT			$85,826	$15,076			$100,902
FIELD PREPARATION							
CONSTRUCTION MANAGEMENT - FD FERNALD			$1,611,629	$165,273	$37,541		$1,814,442
FD FERNALD FIELD SUPPORT COSTS TOTAL			$1,697,455	$180,349	$37,541		$1,915,344
ENGINEERING/DESIGN/INSPECTION - FD FERNALD			$124,815	$9,718	$6,826		$141,359
ENGINEERING COSTS TOTAL			$124,815	$9,718	$6,826		$141,359
SALES TAX - FD FERNALD							$193,100
SUB-TOTAL (BASE ESTIMATE)							$13,625,100
RISK BUDGET 9.7%							$1,321,600
TARGET ESTIMATE (FY 99 DOLLARS)							$14,946,700
CONTINGENCY 11.0%							$1,498,800
TS BURIAL FEE							$6,048,104

ESTIMATE PERFORMED BY ESTIMATING SERVICES

F:\ESTIMATE\SILOS\VIT_1\VIT_1R2.WK4

ESTIMATE SUMMARY SHEET

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.:C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11[illegible]

FACTORS

IXED PRICE SUBCONTRACT	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TO[illegible]
JFC DOLLARS	$1,087,380	$8,200	$16,300	$5,700	$165,500	$1,2[illegible]080
IFC COST FACTOR	2.4682	16.2195	6.6994	124.7895	--	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2087	1.2087	1.2087	1.2087	1.2087	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	2.9834	19.6053	8.5837	159.8893	1.2813	
BASE ESTIMATE $'s	$3,244,134	$160,763	$139,915	$911,369	$212,051	$4,668,232
RISK BUDGET FACTOR	1.0970	1.0970	1.0970	1.0970	1.0970	
TARGET ESTIMATE FACTOR	3.2728	21.5070	9.4164	175.3986	1.4056	
FPS TARGET ESTIMATE (FY99 DOLLARS)	$3,558,815	$176,357	$153,487	$999,772	$232,620	$5,121,050

NOTE:
1.)The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe. SEE De-Escalated Summary.
2.) If there are no DFC Equip. $, enter The IFC Equip. $'s into the direct field cost TOTAL and delete IFC Factor in G65.
3.) If FD Fernald Support dollars appear below, and were generated as a percenatage of the DFC, Risk Budget would apply and these dollars would be de-escalated to FY96. Indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the NO box.
If the FDF Support costs are supported by LOE estimates, use those estimates for input to microframe, enter 'SPACE BAR' in the Yes Box and an X in the N

DOES RISK BUDGET APPLY TO FD FERNALD SUPPORT COSTS	YES	NO X

FD FERNALD SUPPORT COSTS	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
FD FERNALD PROJECT MGMT.						$100,902
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM						$100,900
FD FERNALD CONSTRUCTION MGMT.						$1,814,442
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	[illegible]
TOTAL CM						$1,8[illegible]
J FERNALD WASTE PROGRAM MGMT.						$6,707,060
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM						$6,707,060
FD FERNALD RSO						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO						
FD FERNALD ENGINEERING/DESIGN/INSPECTION						$124,815
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.						$124,820
A/E ENGINEERING/DESIGN/INSPECTION						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E						
SUB-TOTAL PROJECT TARGET EST. (FY99 DOLLARS)						$13,868,270

If FDF Support Costs were based on % defaults, indicate 'Yes' above. These costs are considered FY99 $'s and Risk Budget applies.

If FDF Support Costs were based on LOE estimates provided by the CAM's, indicate 'NO' and escalate the LOE dollars to FY99. (x 1.079)
Risk Budget will NOT apply. Separate the Sales Tax below.

The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

OTHER FD FERNALD SALES TAX - 6%						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER FD FERNALD SALES TAX						

TOTAL PROJECT TARGET EST. (FY99 DOLLARS)

ESTIMATE SUMMARY SHEET

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PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

Direct Field Cost w/FACTORS AND RISK BUDGET

YES	NO
X	

DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

AY ITEM NO.	DESCRIPTION	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
						165500	
	Mobilization Cost	17400		13800	800	165500	197500
		$56,950		$129,950	$140,320	$232,620	$559,840
	Below Grade	155700					155700
		$509,580					$509,580
	Above Grade	877880					
		$2,873,160					$2,873,160
	Demobilization Cost	36400	8200	2500	4900		
		$119,130	$176,360	$23,540	$859,450		$1,178,480
TOTAL DIRECT FIELD COSTS w/FACTORS		(FY99 DOLLARS)					$5,121,060

OTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

CONTAINER PURCHASE & PREPARATION

Labor — 4 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	0.25	$9.17
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28
WASTE - Planner	$37.12	1.00	$37.12
IH - Industrial Hygiene	$25.93	0.00	$0.00
MVOH - HEO	$25.71	4.00	$102.85
MVOH - HAZWAT	$25.71	4.00	$102.85
QA - Performance/QA	$37.30	0.50	$18.65
Total Labor/Container	$27.99	10.00	$279.92

Material

Description	Rate	Qty	Total
Misc - Caulk, banding	$12.79	5	$63.93
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00
Reconditioned L-WMB Container	$4,779.37	1	$4,779.37
Total Material/Container			$4,843.30

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.25	$9.71
Tractor	$38.84	0.25	$9.71
Forktruck	$10.79	0.25	$2.70
Flatbed trailer	$16.19	0.25	$4.05
Total Equipment/Container			$26.17
Total Container Purchase & Preparation			$5,149.38

CONTAINER PACKAGING

Labor — 2 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	1.00	$36.69
WASTE - Waste Tech	$37.12	4.00	$148.47
CLRK - MC&A Clerk	$19.62	0.25	$4.90
RAD - Rad Tech	$28.56	4.00	$114.24
MVOH - HEO	$25.71	8.00	$205.70
MVOH - HAZWAT	$25.71	8.00	$205.70
QA - Performance/QA	$37.30	1.00	$37.30
Total Labor/Container	$28.69	26.25	$753.01

PPE Material $'s

Description	Rate	Qty/day/wkr	Total
Protec Coveralls	$5.72	4	$22.87
Protec shoe covers	$0.42	4	$1.68
Powdered latex gloves	$0.07	4	$0.28
Cotton glove liners	$0.41	4	$1.64
Leather Gloves	$3.05	4	$12.21
Respirator Catridges	$4.75	4	$18.99
Total PPE Material/wkr/day			$57.68
Total PPE Material/container	6	wkrs	$173.05

Equipment

Description	Rate/Day	Days	Total
Trackhoe w/grappler	$38.84	0.5	$19.42
Forktruck	$10.79	0.5	$5.40
Total Equipment/Container			$24.82
Total Packaging			$950.87

CONTAINER STAGING

Labor

Description	Rate	Hours	Total
CLRK - Data Entry Clerk	$19.62	0.25	$4.90
CLRK - MC&A Clerk	$19.62	2.00	$39.23
QA - Performance/QA	$37.30	1.00	$37.30
MAINT - Shipping Supv	$36.69	0.50	$18.34
WASTE - Waste Tech	$37.12	4.00	$148.47
RAD - Rad Tech	$28.56	2.00	$57.12
WASTE - Shipping Coord	$37.12	1.00	$37.12
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	4.00	$102.85
Total Labor per Truckload	$29.99	15.25	$457.41
Total Labor per Container	1	/truck	$457.41

Material

Description	Rate	Qty	Total
Barcode labels	$0.30	2	$0.60
Container seals	$0.28	1	$0.28
Laminate for labels	$0.46	2	$0.93
Total Material/Container			$1.81

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Staging			$474.76

CONTAINER SHIPPING PREPARATION

Labor

Description	Rate	Hours	Total
MAINT - Traffic Coord	$36.69	2.00	$73.37
CLRK - MC&A Clerk	$19.62	3.00	$58.85
QA - Performance/QA	$37.30	4.00	$149.20
RAD - Rad Tech	$28.56	3.17	$90.54
WASTE - Shipping Coord	$37.12	0.10	$3.71
MAINT - Transportation	$36.69	1.50	$55.03
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	0.75	$19.28
MVOH - MVO	$25.71	1.50	$38.57
CRFT - Carpenter	$27.32	0.50	$13.66
UTIL - Laborer	$24.14	1.00	$24.14
MVOH - HEO	$25.71	1.00	$25.71
UTIL - Mechanic	$24.14	0.33	$7.97
Total Labor/Truckload	$29.57	19.35	$572.10
Total Labor per Container	1	/truck	$572.10

Material

Description	Rate	Qty	Total
Placards	$0.38	4	$1.51
Trailer seals	$0.28	1	$0.28
Wood bracing 2x4 - LF	$0.65	40	$25.90
Paint	$17.26	0.1	$1.73
Banding	$0.05	20	$1.08
Total Material/Container			$30.49

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Shipping Preparation			$618.13

CONTAINER SHIPPING - FREIGHT

Flatbed to Nevada Test Site			$3,452.80
Total Freight per Container	1	/truck	$3,452.80

Total Waste Mgmt. Cost/TOP LOADING ISO	$10,645.94

Container Burial - NTS	Rate	Vol cu ft	Total
Top Loading L-WMB Container	$7.50	1,280	$9,600.00

****All costs are in stated in FY99 Dollars.****

Multiply these dollars by 0.9268 to = FY96 $'s for input to MF.
Performed by Estimating Services

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

LOE SUMMARY INPUT - DEESCALATED TO FY96 DOLLARS

Labor Description	FY99 Rate	Hours	FY99 Total	FY96 $'s (0.9268)	NO. of CONTAINERS	630	TOTAL FY96 $'s
MAINT - Ops Supv	$36.69	1.25	$45.86	$42.50			
MAINT - Shipping Supv	$36.69	0.50	$18.34	$17.00			
MAINT - Traffic Coord	$36.69	2.00	$73.37	$68.00			
MAINT - Transportation	$36.69	1.50	$55.03	$51.00			
MAINT		5.25	$192.60	$178.50	630		$112,456.93
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28	$8.60			
WASTE - Planner	$37.12	1.00	$37.12	$34.40			
WASTE - Waste Tech	$37.12	8.00	$296.94	$275.20			
WASTE - Shipping Coord	$37.12	1.10	$40.83	$37.84			
WASTE		10.35	$384.17	$356.05	630		$224,309.06
IH - Industrial Hygiene	$25.93	0.00	$0.00	$0.00			
Industrial Hygiene		0.00	$0.00	$0.00			
QA - Performance/QA	$37.30	6.50	$242.46	$224.71			
QA		6.50	$242.46	$224.71	630		$141,566.58
RAD - Rad Tech	$28.56	9.17	$261.91	$242.73			
RAD		9.17	$261.91	$242.73	630		$152,922.47
CRFT - Carpenter	$27.32	0.50	$13.66	$12.66			
CRFT		0.50	$13.66	$12.66	630		$7,975.94
MVOH - HEO	$25.71	13.00	$334.26	$309.80			
MVOH - HAZWAT	$25.71	16.75	$430.69	$399.16			
MVOH - MVO	$25.71	1.50	$38.57	$35.75			
MVOH		31.25	$803.52	$744.70	630		$469,161.19
UTIL - Warehouse Attendant	$24.14	1.00	$24.14	$22.37			
UTIL - Laborer	$24.14	1.00	$24.14	$22.37			
UTIL - Mechanic	$24.14	0.33	$7.97	$7.38			
UTIL		2.33	$56.24	$52.12	630		$32,837.49
CLRK - MC&A Clerk	$19.62	5.25	$102.99	$95.45			
CLRK - Data Entry Clerk	$19.62	0.25	$4.90	$4.55			
CLRK		5.50	107.89	$99.99	630		$62,994.78
TOTAL LABOR HOURS & DOLLARS		70.85	$2,062.44	$1,911.47	630		$1,204,224.45
Misc. Material							
Description	Rate	Qty	Total				
			$0.00	$0.00			
Misc - Caulk, banding	$12.79	5	$63.93	$59.25			
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00	$0.00			
Barcode Labels	$0.30	2	$0.60	$0.56			
Container Seals	$0.28	1	$0.28	$0.26			
Laminate for Labels	$0.46	2	$0.93	$0.86			
Placards	$0.38	4	$1.51	$1.40			
Trailer Seals	$0.28	1	$0.28	$0.26			
Wood bracing 2x4 - LF	$0.65	40	$25.90	$24.00			
Paint	$17.26	0.1	$1.73	$1.60			
Banding	$0.05	20.0	$1.08	$1.00			
TOTAL MISC. MATERIAL DOLLARS		85.10	$96.23	$89.19	630		$56,188.46
Container Purchase - Material							
Reconditioned L-WMB Container	$4,779.37	1.00	$4,779.37	$4,429.52			
TOTAL CONTAINER PURCHASE DOLLARS		1.00	$4,779.37	$4,429.52	630		$2,790,595.20
Equipment							
Description	Rate/Day	Days	Total				
Taylor - forktruck	$38.84	0.65	$25.25	$23.40			
Tractor	$38.84	0.65	$25.25	$23.40			
Forktruck	$10.79	0.75	$8.09	$7.50			
Flatbed Trailer	$16.19	0.25	$4.05	$3.75			
Trackhoe w/grappler	$38.84	0.50	$19.42	$18.00			
TOTAL EQUIPMENT DOLLARS		2.80	$82.06	$76.05	630		$47,912.32
PPE MATERIAL COST							
Description	WKR/DAY	$/DAY	Total				
Total PPE Material/container	6	57.68	$173.05	$160.38			
				$160.38	630		$101,041.14
CONTAINER SHIPPING - FREIGHT							
Flatbed to Nevada Test Site			$3,452.80	$3,200.06	630		$2,016,034.68
TOTAL FDF WASTE MGMT. COSTS		FY99	$10,645.94	FY96 $'s	630		$6,215,996.24
TOTAL DOE NTS BURIAL FEE COSTS		1280.00	806400	cu.ft.	630	$8.95	$5,605,288.40

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

ASSUMPTIONS

CONTAINER PREPARATION:

a. Four containers can be prepared per day.
b. Containers are reconditioned and the prices reflect the current acquisition contract costs.

CONTAINER PACKAGING:

a. Two containers can be packaged per day.
b. PPE quantities are for six workers.
c. PPE pricing is based on unit costs from the Lab Safety catalog and escalated to FY98 dollars.

CONTAINER STAGING:

a. The labor to stage containers to load on a flatbed truck. Divide by containers / truck load. For this study, assume 1 container per truck load.
b. The material and equipment costs are for one container.

CONTAINER SHIPPING PREPARATION:

a. The labor to prepare and load a flatbed truck. Divide by containers per truck load. For this study assume 1 container per truck load. (42,000# gross weight)
b. The material and equipment costs are for one container.

CONTAINER SHIPPING FREIGHT:

a. Shipping charges are based on an avg. of three carrier contract rates currently being used at the site.
b. NTS burial costs are the anticipated FY98 rates that include shipping scrap copper volumes. If this does not happen, rates could be as high as $12.50 per cubic foot.

LABOR:

a. These costs are for direct field/operations costs. Project management costs are excluded.
b. Labor dollars are based on the FY99 Replan rates and are considered FY98 dollars.

EQUIPMENT:

a. Equipment dollars are for maintenance costs only. Any purchase cost and fuel usage have been excluded.

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D & D Vit 1 Combustion Melter Heater

Unbulked Material Estimates (ft3

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Vit 1	104,117		65,907				155	69,325		239,504
Total	**104,117**		**65,907**				**155**	**69,325**		**239,504**

D & D Vit 1 Combustion Melter Heater

Bulked Material Estimates (ft3)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Vit 1	353,998		85,680				310	138650		578,638
Total	**353,998**		**85,680**				**310**	**138,650**		**578,638**
Container	ROB		ROB				ROB			
Quantity	437		212				1	172		
Disposition	OSDF		OSDF				OSDF	OSDF		

NOTE - OSDF prohibited material equates to 5173 cubic feet which can be dispositioned to NTS utilizing 65 White Metal Boxes or 5 End Loading ISO containers.

578,638/1,025 = 565 + 65 = 630 ALL BOXES TO NTS

D & D Vit 1 Combustion Melter Heater

Material Weight Estimates (Tons)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Vit 1	4,425		4,284				2	1012		9,723
Total	**4,425**		**4,284**				**2**	**1,012**		**9,723**

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DEBRIS BULKING FACTORS

* A - Accessible Metals (OSDF 2)
  Bulking Factor 3

* B - Inaccessible Metals (OSDF 2)
  Bulking Factor 3

* C - Process-Related Metals
  Bulking Factor 3

* D - Light-Gauge Metals (OSDF 2)
  Bulking Factor 2

* E - Concrete (OSDF 2)
  Bulking Factor 1.3

* G - Non-Regulated ACM (OSDF 2/3)
  Bulking Factor 1.2

* H - Regulated ACM (OSDF 5)
  Bulking Factor 3

* I - Miscellaneous Debris (OSDF 2/4)
  Bulking Factor 3.5

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost				820						17,400		13,800	800	$32,000
	Below Grade VIT Bldg				3,465						70,160				$70,160
	Below Grade Analytical Lab				54						1,090				$1,090
	Below Grade Mech/Elect				550						11,140				$11,140
	Below Grade Warehouse				724						14,660				$14,660
	Below Grade Additive Storage				197						3,990				$3,990
	Below Grade On-Site Storage				2,296						46,490				$46,490
	Below Grade Site Work & Interconnecting Bldg.				404						8,170				$8,170
	Above Grade VIT Bldg				17,891						362,260				$362,260
	Above Grade Analytical Lab				675						13,660				$13,660
	Above Grade Mech/Elect				1,706						34,550				$34,550
	Above Grade Warehouse				506						10,230				$10,230
	Above Grade Control Room				80						1,610				$1,610
	Above Grade Additive Storage				1,660						33,630				$33,630
	Above Grade On-Site Storage				3,019						61,120				$61,120
	Above Grade Site Work & Interconnecting Bldg.				1,819						36,820				$36,820
	Equipment				11,549						233,900				$233,900
	Piping Systems				1,399						28,300				$28,300
	Instrumentation				671						13,600				$13,600
	Electrical				2,381						48,200				$48,200
	Demobilization Cost				1,780						36,400	8,200	2,500	4,900	$52,000
	Total Direct Cost				53,646						$1,087,380	$8,200	$16,300	$5,700	$1,117,580

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DETAIL ESTIMA _ WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Temporary Utilities	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		1000	20.27			1500	3.50	$20,270		$1,500	$3,500	$25,270
D	Remove Temporary Utilitries	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000			$3,240	$8,220			$11,460
	Total				1,780						$36,400	$8,200	$2,500	$4,900	$52,000

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	VIT Bldg.														
	Concrete Below grade														
mC	SOG	685	cy	1.08	1417	20.25					$28,690				$28,690
mC	Structural footings	240	cy	1.08	496	20.25					$10,040				$10,040
mC	Wall footings	610	cy	1.08	1262	20.25					$25,560				$25,560
mC	Equipment foundations	140	cy	1.08	290	20.25					$5,870				$5,870
	VIT Bldg.														
	Concrete Above grade														
mC	Grout	300	cf	0.04	23	20.25					$470				$470
mC	Walls	3535	cy	1.08	7312	20.25					$148,070				$148,070
mC	Elevated floor	1340	cy	1.08	2772	20.25					$56,130				$56,130
mC	Tilt up walls 5,375sf x 1' thick	5375	cf	0.04	412	20.25					$8,340				$8,340
mC	Columns for mod. walls	85	cy	1.08	176	20.25					$3,560				$3,560
	VIT Bldg.														
	Structural Steel														
mC	Metal roofing 20guage 1.5#/sf	8965	sf	0.008	137	20.25					$2,770				$2,770
mC	Light steel	76	ton	5.00	728	20.25					$14,740				$14,740
mC	Medium steel	84	ton	5.00	804	20.25					$16,280				$16,280
mC	Heavy steel	94	ton	5.00	900	20.25					$18,230				$18,230
mC	Crane rails	2	ton	5.00	17	20.25					$340				$340
mC	Checkered plate 14,500sf 5/16" 12.75#/sf	93	ton	5.00	891	20.25					$18,040				$18,040
mC	Ladders 6#/lf 89 lf	0.267	ton	5.00	3	20.25					$60				$60
mC	Stairs 50#/riser 307 risers	8	ton	5.00	73	20.25					$1,480				$1,480
mC	Handrail 2runs 2" cs pipe=7.3#/lf 195lf	1	ton	5.00	7	20.25					$140				$140
mC	Davits 5ea	1	ton	5.00	10	20.25					$200				$200
mC	Crane rail box beam		ton	5.00		20.25									
mC	Pre-engineered struct 2180sf * 9#	10	ton	5.00	94	20.25					$1,900				$1,900
	VIT Bldg.														
	Architectural/Buildings/Finishes														
mC	Metal stud w/ gyp. board 3/8"	1955	sf	0.05	172	20.25					$3,480				$3,480
mC	Siding 1/8" metal	31160	sf	0.02	1194	20.25					$24,180				$24,180
mC	Membrane roofing 1/16" sealant	8965	sf	0.02	343	20.25					$6,950				$6,950
mC	Roof insulation 1/2"	8965	sf	0.02	309	20.25					$6,260				$6,260
mC	Fiberboard 1/2"	8965	sf	0.02	309	20.25					$6,260				$6,260
mC	Batten insulation 1/2"	15580	sf	0.02	537	20.25					$10,870				$10,870
mC	Double ext. doors metal	6	ea	0.67	8	20.25					$160				$160
mC	Single ext. drs. mtl.	6	ea	0.50	6	20.25					$120				$120
mC	Roll-up dr. 14'x14' mtl.	3	ea	3.20	18	20.25					$360				$360
mC	Double interior dr mtl.	14	ea	0.67	18	20.25					$360				$360
mC	Single interior dr. mtl	4	ea	0.50	4	20.25					$80				$80

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DETAIL ESTIMA WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
mC	HVAC Duct galv. steel. medium	45	ton	5.00	431	20.25					$8,730				$8,730
mC	HVAC dampers	1	ton	5.00	10	20.25					$200				$200
mC	HVAC accessories	1	ton	5.00	10	20.25					$200				$200
mC	HVAC supports	1	ton	5.00	10	20.25					$200				$200
mC	Building sprinklers	2000	lf	0.040	153	20.25					$3,100				$3,100
	Analytical Lab														
	Concrete Below grade														
mC	SOG 26cy * 27	702	cf	0.040	54	20.25					$1,090				$1,090
	Analytical Lab														
	Concrete Above grade														
mC	Walls 28cy *27	756	cf	0.040	58	20.25					$1,170				$1,170
mC	Elevated slab 18cy *27	486	cf	0.040	37	20.25					$750				$750
	Analytical Lab														
	Structural steel														
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf 62 lf	0.11	ton	5.00	1	20.25					$20				$20
	Analytical Lab														
	Architectural/Buildings/Finishes														
mC	Metal stud w/gyp brd 3/8"	4380	sf	0.05	386	20.25					$7,820				$7,820
mC	Skirt trailers 1/8" metal	3024	sf	0.02	104	20.25					$2,110				$2,110
mC	Stairs and ramps metal	2	ton	5.00	19	20.25					$380				$380
mC	Single ext. dr. mtl.	4	ea	0.40	3	20.25					$60				$60
mC	Single int. dr. mtl.	19	ea	0.40	15	20.25					$300				$300
mC	Building sprinklers	500	lf	0.04	38	20.25					$770				$770
mC	HVAC Duct	2	ton	5.00	14	20.25					$280				$280
	Mech/Elect														
	Concrete below grade														
mC	SOG 175cy * 27	4725	cf	0.04	362	20.25					$7,330				$7,330
mC	Structural footings 60cy * 27	1620	cf	0.04	124	20.25					$2,510				$2,510
mC	Equipment foundations30cy * 27	810	cf	0.04	62	20.25					$1,260				$1,260
mC	Grout	30	cf	0.04	2	20.25					$40				$40
	Mech/Elect														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	5610	sf	0.01	86	20.25					$1,740				$1,740
mC	Light steel	8	ton	5.00	77	20.25					$1,560				$1,560
mC	Medium steel	11	ton	5.00	105	20.25					$2,130				$2,130
mC	Heavy steel	13	ton	5.00	124	20.25					$2,510				$2,510
mC	Ladders 28 lf 6#/lf	0.1	ton	5.00	1	20.25					$20				$20

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mech/Elect														
	Architectural														
mC	Siding 1/8"mtl.	11620	sf	0.02	445	20.25					$9,010				$9,010
mC	Roof insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Wall insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Membrane roofing 1/16" sealant	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Fiber board 1/2"	5610	sf	0.018	193	20.25					$3,910				$3,910
mC	Single ext. dr. mtl.	2	ea	0.400	2	20.25					$40				$40
mC	Double ext. dr. mtl.	3	ea	0.67	4	20.25					$80				$80
mC	Roll-up door 14'x14' mtl.	1	ea	3.20	6	20.25					$120				$120
mC	Double int. dr. mtl.	2	ea	0.67	3	20.25					$60				$60
mC	HVAC Duct galv. steel. medium	3	ton	5.00	29	20.25					$590				$590
mC	HVAC dampers	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC accessories	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC supports	0.25	ton	5.00	2	20.25					$40				$40
mC	Building sprinklers	600	lf	0.040	46	20.25					$930				$930
	Warehouse														
	Concrete Below grade														
mC	SOG 330cy * 27	8910	cf	0.04	683	20.25					$13,830				$13,830
mC	Structural footings 20cy * 27	540	cf	0.04	41	20.25					$830				$830
	Warehouse														
	Structural steel														
mC	Pre-engineered struct. 9600sf 9#/sf	43	ton	5.00	414	20.25					$8,380				$8,380
	Warehouse														
	Architectural														
mC	Metal stud w/ gyp bd.	100	sf	0.05	10	20.25					$200				$200
mC	Single ext. dr. mtl.	6	ea	0.40	5	20.25					$100				$100
mC	Double exterior door metal	1	ea	0.67	1	20.25					$20				$20
mC	Roll-up door metal 14'x14'	3	ea	3.20	18	20.25					$360				$360
mC	Single interior door metal	1	ea	0.40	1	20.25					$20				$20
mC	Building sprinklers	750	lf	0.040	57	20.25					$1,150				$1,150
	Control Room														
	Architectural														
mC	Metal stud w/ gyp bd.	560	sf	0.05	54	20.25					$1,090				$1,090
mC	Skirting 1/8" metal	348	sf	0.02	13	20.25					$260				$260
mC	Metal ramp & stairs	0.5	ton	5.00	5	20.25					$100				$100
mC	Single interior door metal	4	ea	0.40	3	20.25					$60				$60
mC	HVAC duct, supports, dampers & acces.	0.50	ton	5.00	5	20.25					$100				$100

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CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMA . WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Additive Storage														
	Concrete Below grade														
mC	SOG	60	cy	1.08	124	20.25					$2,510				$2,510
mC	Structural footings	25	cy	1.08	52	20.25					$1,050				$1,050
mC	Equipment foundation	10	cy	1.08	21	20.25					$430				$430
	Additive Storage														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	1100	sf	0.01	17	20.25					$340				$340
mC	Light steel	8	ton	5.00	77	20.25					$1,560				$1,560
mC	Medium steel	11	ton	5.00	105	20.25					$2,130				$2,130
mC	Heavy steel	12	ton	5.00	115	20.25					$2,330				$2,330
mC	Checkered plate 1,000 sf 5/16" 12.75#/sf	6	ton	5.00	61	20.25					$1,240				$1,240
mC	Stairs 50#/riser 110 risers	3	ton	5.00	26	20.25					$530				$530
mC	Bin loading lines =<2 1/2"	260	lf	0.05	26	20.25					$530				$530
	Additive Storage														
	Architectural														
mC	Siding 1/8"mtl.	20110	sf	0.02	770	20.25					$15,590				$15,590
mC	Roof insulation 1/2"	1100	sf	0.02	38	20.25					$770				$770
mC	Wall insulation 1/2"	10055	sf	0.02	347	20.25					$7,030				$7,030
mC	Membrane roofing 1/16" sealant	1100	sf	0.02	38	20.25					$770				$770
mC	Fiber board 1/2"	1100	sf	0.018	38	20.25					$770				$770
mC	Single ext. dr. mtl.	1	ea	0.400	1	20.25					$20				$20
mC	Double ext. dr. mtl.	1	ea	0.67	1	20.25					$20				$20
	On-Site Storage														
	Concrete Below grade														
mC	SOG	780	cy	1.08	1613	20.25					$32,660				$32,660
mC	Structural footing	155	cy	1.08	321	20.25					$6,500				$6,500
mC	Continuos footing	175	cy	1.08	362	20.25					$7,330				$7,330
	On-Site Storage														
	Concrete Above grade														
mC	Tilt-up walls 16,360 sf * 1ft thick	16360	cf	0.04	1253	20.25					$25,370				$25,370
mC	Columns for mod. wall	250	cy	1.08	517	20.25					$10,470				$10,470
	On-Site Storage														
	Structural steel														
mC	Light steel	96	ton	5.00	919	20.25					$18,610				$18,610
mC	Medium steel	1	ton	5.00	10	20.25					$200				$200
mC	Heavy steel	4	ton	5.00	38	20.25					$770				$770
mC	Crane rail box beam stl.	10	ton	5.00	92	20.25					$1,860				$1,860
mC	Supports for box beam	1	ton	5.00	10	20.25					$200				$200
mC	Crane rail stops	1	ton	5.00	10	20.25					$200				$200

000354

DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	On-Site Storage														
	Architectural														
mC	Single ext. dr. mtl.	6	ea	0.40	5	20.25					$100				$100
mC	Roll-up door metal 14'x14'	2	ea	3.20	12	20.25					$240				$240
mC	Building sprinklers	2000	lf	0.040	153	20.25					$3,100				$3,100
	Site Work														
	Pipe rack / Below grade concrete														
mC	Structural footings 26cy *27	702	cf	0.040	54	20.25					$1,090				$1,090
	Site Work														
	Pipe rack / Structural steel														
mC	Light steel	3	ton	5.00	29	20.25					$590				$590
mC	Medium steel	4	ton	5.00	38	20.25					$770				$770
mC	Heavy steel	5	ton	5.00	48	20.25					$970				$970
	Site Work														
	Cooling tower / Below grade concrete														
mC	Concrete 25cy *27	675	cf	0.04	52	20.25					$1,050				$1,050
	Site Work														
	Contam'd water/Below grade concrete														
mC	SOG 40cy *27	1080	cf	0.04	83	20.25					$1,680				$1,680
	Site Work														
	Contam'd water/Above grade concrete														
mC	Walls 105 cy * 27	2835	cf	0.04	217	20.25					$4,390				$4,390
mC	Concrete blocks	270	cf	0.04	21	20.25					$430				$430
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf	0.2	ton	5.00	2	20.25					$40				$40
mC	Double contained pipe HDPE	2100	lf	0.20	804	20.25					$16,280				$16,280
	Site Work														
	Storm water														
mC	Catch Basins	108	cf	0.04	8	20.25					$160				$160
	Site Work														
	Off-Gas & HVAC Stack Below grade														
mC	Structural footings 6cy *27	162	cf	0.04	12	20.25					$240				$240
mC	Stack Base 4cy *27	108	cf	0.04	8	20.25					$160				$160
mC	Duct footings 6cy * 27	162	cf	0.04	12	20.25					$240				$240
mC	Guy anchors 8cy * 27	216	cf	0.04	17	20.25					$340				$340

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CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIM . WORKSHEETS

PROJEC. Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Site Work														
	Off-Gas & HVAC Stack Above grade														
mC	Stack structure	4	ton	5	38	20.25					$770				$770
mC	Ladder 160lf 6#/lf	0.5	ton	5	5	20.25					$100				$100
mC	Grating 86sf 10#/sf	0.45	ton	5	4	20.25					$80				$80
mC	Platform steel	0.44	ton	5	4	20.25					$80				$80
mC	Davit 2ea	0.5	ton	5	5	20.25					$100				$100
mC	Kickplate 48lf	48	lf	0.016	1	20.25					$20				$20
mC	Duct to Stack 200lf	200	lf	0.143	55	20.25					$1,110				$1,110
mC	Duct support 4 ea	0.5	ton	5	5	20.25					$100				$100
mC	Handrail 48lf 2runs 2"cs pipe 7.3#/lf	0.2	ton	5	2	20.25					$40				$40
	Site Work														
	Poten. Contam. Water														
C	Drain lines	1500	lf	0.16	481	20.25					$9,740				$9,740
	Interconnecting Facility														
	Concrete Below grade														
mC	SOG	60	cy	1.08	124	20.25					$2,510				$2,510
mC	Structural footings	10	cy	1.08	21	20.25					$430				$430
mC	Equipment foundation	10	cy	1.08	21	20.25					$430				$430
	Interconnecting Facility														
	Structural steel														
mC	Pre-engineered struct 1,200 sf * 9#	5	ton	5.00	52	20.25					$1,050				$1,050

000356

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	15-ag-001 Setting tank rake 1hp	0.25	tn	20	10	20.25					$200				$200
C	15-ag-002 Slurry surge agitator	2.5	tn	20	100	20.25					$2,030				$2,030
C	15-ag-003,004 Feed prep agitator	4.5	tn	20	180	20.25					$3,650				$3,650
C	15-ag-005 Overflow agitator	0.2	tn	20	8	20.25					$160				$160
C	15-ag-006 Slurry receipt agitator	2.75	tn	20	110	20.25					$2,230				$2,230
C	15-fl-001 Milled slot screen	0.25	tn	20	10	20.25					$200				$200
C	15-pm-001a&b Underflow pump	0.5	tn	20	20	20.25					$410				$410
C	15-pm-002a&b Slurry surge pump	1	tn	20	40	20.25					$810				$810
C	15-pm-003a&b Feed prep pump	1	tn	20	40	20.25					$810				$810
C	15-pm-004a&b Feed prep pump	1	tn	20	40	20.25					$810				$810
C	15-pm-005 Overflow tnk pump A & B	0.5	tn	20	20	20.25					$410				$410
C	15-pm-006a&b Slurry recpt tnk pump	0.5	tn	20	20	20.25					$410				$410
C	15-pm-007 Flush wtr. pump A & B	2	tn	20	80	20.25					$1,620				$1,620
C	15-me-001 Feed mill	1.5	tn	20	60	20.25					$1,220				$1,220
C	15-tk-001 Settling tank	2	tn	20	80	20.25					$1,620				$1,620
C	15-tk-002 Slurry surge tank	6	tn	20	241	20.25					$4,880				$4,880
C	15-tk-003&4 Feed prep tank	8	tn	20	321	20.25					$6,500				$6,500
C	15-tk-005 Overflow sump tank	1	tn	20	40	20.25					$810				$810
C	15-tk-006 Slurry recpt tank	8	tn	20	321	20.25					$6,500				$6,500
C	16-ag-001a&b Melter feed agitator	2	tn	20	80	20.25					$1,620				$1,620
C	16-pm-001a&b Melter recirl pump A & B	0.75	tn	20	30	20.25					$610				$610
C	16-pm-002a&b Melter feed pump A&B	0.5	tn	20	20	20.25					$410				$410
C	16-tk-001a&b Melter feed tank A & B	2	tn	20	80	20.25					$1,620				$1,620
C	17-fa-001 Main forced draft fan	0.25	tn	20	10	20.25					$200				$200
C	17-fa-002 Auxiliary forced draft fan	0.25	tn	20	10	20.25					$200				$200
C	17-pe-001 Combust melter & recpt	10	tn	20	401	20.25					$8,120				$8,120
C	18-ag-001 Caustic agitator	1	tn	20	40	20.25					$810				$810
C	18-ag-002 Scrubber agitator	0.2	tn	20	8	20.25					$160				$160
C	18-ag-003 Filter feed agitator	0.2	tn	20	8	20.25					$160				$160
C	18-fa-001 EOG fan	0.25	tn	20	10	20.25					$200				$200
C	18-fl-001 Precipt. filter A & B	0.2	tn	20	8	20.25					$160				$160
C	18-fl-002 Knockout tank filter	0.4	tn	20	16	20.25					$320				$320
C	18-fl-003 EOG HEPA filter	0.2	tn	20	8	20.25					$160				$160
C	18-he-001 Quench tower cooler	1	tn	20	40	20.25					$810				$810
C	18-he-002 Scrubber cooler	1	tn	20	40	20.25					$810				$810
C	18-pe-001 Quench tower	1	tn	20	40	20.25					$810				$810
C	18-pe-002 Spray tower	1	tn	20	40	20.25					$810				$810
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		2,630	20.27					53,300				$53,300

- 8113

000357

DETAIL ESTIM. . WORKSHEETS

PROJEC. Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Equipment Equip. No. Description	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
C	18-pe-003 Elect. precipitator	1	tn	20	40	20.25					$810				$810
C	18-pm-001 Quench tower pump A & B	1	tn	20	40	20.25					$810				$810
C	18-pm-002 Scrubber pump A & B	0.5	tn	20	20	20.25					$410				$410
C	18-pm-003 WESP underflow Pump A & B	0.2	tn	20	8	20.25					$160				$160
C	18-pm-004 Scrubber caustic pump A & B	0.4	tn	20	16	20.25					$320				$320
C	18-pm-005 Scrubber purge pump A & B	0.4	tn	20	16	20.25					$320				$320
C	18-pm-006 Filter feed pump A & B	0.5	tn	20	20	20.25					$410				$410
C	18-pm-007 Filter pump A & B	0.4	tn	20	16	20.25					$320				$320
C	18-st-001 EOG stack	1	tn	20	40	20.25					$810				$810
C	18-tk-001 Caustic tank	1.5	tn	20	60	20.25					$1,220				$1,220
C	18-tk-002 Purge tank	0.25	tn	20	10	20.25					$200				$200
C	18-tk-003 Filter feed tank	0.25	tn	20	10	20.25					$200				$200
C	18-tk-004 Filter tank	0.25	tn	20	10	20.25					$200				$200
C	18-tk-005 EOG knockout tank	0.2	tn	20	8	20.25					$160				$160
C	20-fa-001 Off-Gas fan A & B	0.2	tn	20	8	20.25					$160				$160
C	20-fl-001 Off-Gas HEPA filter	0.1	tn	20	4	20.25					$80				$80
C	20-he-001 Off-gas Condenser	0.2	tn	20	8	20.25					$160				$160
C	20-he-002 Off-gas Cooler	0.75	tn	20	30	20.25					$610				$610
C	20-pm-001 Condensate pump A & B	0.2	tn	20	8	20.25					$160				$160
C	20-pm-002 Coolant supply pump A & B	0.2	tn	20	8	20.25					$160				$160
C	20-m-003&4 Carbon bed	40	tn	20	1604	20.25					$32,480				$32,480
C	20-m-002 Air dryer package A,B, & C	3	tn	20	120	20.25					$2,430				$2,430
C	20-m-005 NOx removal system	1	tn	20	40	20.25					$810				$810
C	20-ru-001 Chiller package A,B, & C	3	tn	20	120	20.25					$2,430				$2,430
C	20-st-002 Off-gas stack	2	tn	20	80	20.25					$1,620				$1,620
C	20-tk-001 Condensate tank	0.2	tn	20	8	20.25					$160				$160
C	20-tk-003 Chilled water tank	1.5	tn	20	60	20.25					$1,220				$1,220
C	23-cr-001 Monolith CCTV contrl. station	0.1	tn	20	4	20.25					$80				$80
C	23-cy-001 MTC Conveyor	2.5	tn	20	100	20.25					$2,030				$2,030
C	23-me-002 Storage rack	6	tn	20	241	20.25					$4,880				$4,880
C	23-me-001 MCT lift	4	tn	20	160	20.25					$3,240				$3,240
C	23-tv-001 Monolith CCTV	0.2	tn	20	8	20.25					$160				$160
C	24-cn-001 MCR bridge crane	4	tn	20	160	20.25					$3,240				$3,240
C	24-cy-001 Shipping conveyor	20	tn	20	802	20.25					$16,240				$16,240
C	24-cn-002 MTC lift station	2	tn	20	80	20.25					$1,620				$1,620
C	24-me-002 Capping station	3	tn	20	120	20.25					$2,430				$2,430
C	25-hd-001 Container forklift A & B	2	tn	20	80	20.25					$1,620				$1,620
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		4,167	20.25					$84,400				$84,400

000358

08/20/99

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	30-xt-001 Main transformer	0.4	tn	20	16	20.25					$320				$320
C	26-bn-001 Vacuum bin	0.25	tn	20	10	20.25					$200				$200
C	26-bn-002 Frit bin	0.25	tn	20	10	20.25					$200				$200
C	26-me-001 Glass breaker	1.5	tn	20	60	20.25					$1,220				$1,220
C	26-pe-001 Hammer mill	0.25	tn	20	10	20.25					$200				$200
C	26-cn-001 Bridge crane	15	tn	20	601	20.25					$12,170				$12,170
C	26-cy-001 Conveyor	7	tn	20	281	20.25					$5,690				$5,690
C	26-cy-002 Scrap metal conveyor	10	tn	20	401	20.25					$8,120				$8,120
C	26-hd-001 Metal retriever	1	tn	20	40	20.25					$810				$810
C	26-hd-002 Vacuum system	1	tn	20	40	20.25					$810				$810
C	26-hd-003 Monolith rework station	2	tn	20	80	20.25					$1,620				$1,620
C	26-hd-004 Scrap mrtl. box	2	tn	20	80	20.25					$1,620				$1,620
C	26-tv-001..007 CCTV cameras	0.5	tn	20	20	20.25					$410				$410
C	31-mc-001 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-mc-002 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-mc-003 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-mc-004 Motor control center	0.2	tn	20	8	20.25					$160				$160
C	31-sg-001 Switch gear	0.75	tn	20	30	20.25					$610				$610
C	40-cm-003 Instrument air compressor	0.75	tn	20	30	20.25					$610				$610
C	40-dr-002 Air compressor dryer	0.25	tn	20	10	20.25					$200				$200
C	40-ve-002 Receiving tank	0.2	tn	20	8	20.25					$160				$160
C	40-cm-002 Plant air compressor	0.2	tn	20	8	20.25					$160				$160
C	40-dr-001 Air compressor dryer	0.2	tn	20	8	20.25					$160				$160
C	40-ve-001 Receiving tank	0.3	tn	20	12	20.25					$240				$240
C	41-cm-001Breathing air station A & B	4	tn	20	160	20.25					$3,240				$3,240
C	44-bl-001& 2 Addit. trans. blower	0.2	tn	20	8	20.25					$160				$160
C	44-bn-001,2,&3 Addit. bin 1 and 2	3	tn	20	120	20.25					$2,430				$2,430
C	44-bn-004 Mixed addit. bin	0.3	tn	20	12	20.25					$240				$240
C	44-bn-005 Addit. weight bin	0.3	tn	20	12	20.25					$240				$240
C	44-fl-002 Filter receiver A & B	2.2	tn	20	88	20.25					$1,780				$1,780
C	44-pm-001 Dense phase pump	0.1	tn	20	4	20.25					$80				$80
C	50-pm-001 Process wtr. pump A & B	0.4	tn	20	16	20.25					$320				$320
C	50-tk-001 Process wtr. tank	0.2	tn	20	8	20.25					$160				$160
C	53-pm-001,002 Cooling tower pump	0.1	tn	20	4	20.25					$80				$80
C	53-pm-003 Cooling tower	10	tn	20	401	20.25					$8,120				$8,120
C	63-tk-002 Lab waste tank A & B	0.2	tn	20	8	20.25					$160				$160
	Take-off Allowance														
	Subtotal Direct Cost	1.0	LOT	2,628		20.24					53,200				$53,200

000359

8113

08/20/99

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIM. WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C.	73-ah-001 Oper. area aircondit. unit	0.25	tn	20	10	20.25					$200				$200
C	73-ah-002 HVAC rm. air hdlg. unit	0.2	tn	20	8	20.25					$160				$160
C	73-ah-003 Melter aircond. unit	0.75	tn	20	30	20.25					$610				$610
C	73-fa-001 Corridor fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-002 Melter exh. fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-003 Cooling room fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-004 Loading area fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fa-005 Rework room fan A & B	0.2	tn	20	8	20.25					$160				$160
C	73-fl-001 Cooling rm. HEPA A,B, & C	0.1	tn	20	4	20.25					$80				$80
C	73-fl-002 Loading area HEPA A,B, & C	0.1	tn	20	4	20.25					$80				$80
C	73-fl-003 Rework rm. HEPA A,B, & C	0.1	tn	20	4	20.25					$80				$80
C	73-me-001..006 Wall louver	0.4	tn	20	16	20.25					$320				$320
C	73-st-001 Vit. bldg. exh. stack	1	tn	20	40	20.25					$810				$810
C	75-ah-001 Lab. office HVAC unit	0.25	tn	20	10	20.25					$200				$200
C	75-ah-002 Lab HVAC unit	0.25	tn	20	10	20.25					$200				$200
C	75-fa-001 Lab. bldg. exh. A & B	0.1	tn	20	4	20.25					$80				$80
C	75-fl-001 Lab. bldg. HEPA unit A & B	0.1	tn	20	4	20.25					$80				$80
C	76-ah-001 M/E bldg. HVAC unit	1	tn	20	40	20.25					$810				$810
C	76-ah-002 Warehouse air units	1	tn	20	40	20.25					$810				$810
C	76-fa-001,002 M/E wall exhausters	0.2	tn	20	8	20.25					$160				$160
C	76-fa-003 Welding hood	0.2	tn	20	8	20.25					$160				$160
C	76-fa-004 M/E wall exh.	0.1	tn	20	4	20.25					$80				$80
C	76-fa-005 M/E wall exh.	0.1	tn	20	4	20.25					$80				$80
C	76-he-001 Elect. rm. heater	0.1	tn	20	4	20.25					$80				$80
C	76-he-002 Warehouse office heater	0.1	tn	20	4	20.25					$80				$80
C	76-he-003 Warehouse unit heater A..F	0.2	tn	20	8	20.25					$160				$160
C	76-me-001 M/E wall louver A & B	0.2	tn	20	8	20.25					$160				$160
C	80-cn-001 Melter rm. bridge crane	20	tn	20	802	20.25					$16,240				$16,240
C	80-cn-002 Miscl. monorails	10	tn	20	401	20.25					$8,120				$8,120
C	80-cn-003 Maint. shop crane	10	tn	20	401	20.25					$8,120				$8,120
C	82-me-001 Lid install. system	1	tn	20	40	20.25					$810				$810
C	83-sd-001 Shield doors	1	tn	20	40	20.25					$810				$810
C	83-sd-002 Airlock doors	1	tn	20	40	20.25					$810				$810
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		2,036	20.24					41,200				41,200

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08/20/99

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	83-sd-003 Shield door	0.4	tn	20	16	20.25					$320				$320
C	83-sd-004 Shield windows	0.1	tn	20	4	20.25					$80				$80
C	84-me-001 Glass sampling station	0.5	tn	20	20	20.25					$410				$410
C	84-hd-003 Monolith sample insert	0.1	tn	20	4	20.25					$80				$80
C	93-sa-001 Emergency eyewash/shower	0.1	tn	20	4	20.25					$80				$80
C	94-se-001 Analy. lab. equip.	1	tn	20	40	20.25					$810				$810
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		88	20.45					1,800				$1,800

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CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIM. : WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
15	**Piping Systems**														
C	Remove 1/2" c.s. gate valve	49	EA	Included											
C	Remove 3/4" c.s. gate valve	14	EA	Included											
C	Remove 2" c.s. gate valve	14	EA	Included											
C	Remove 1-1/2" c.s. butterfly valve	1	EA	Included											
C	Remove 1-1/2" c.s. gate valve	1	EA	Included											
16															
C	Remove 1/2" c.s. gate valve	14	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
C	Remove 2" c.s. gate valve	4	EA	Included											
18															
C	Remove 1/2" c.s. gate valve	40	EA	Included											
C	Remove 3/4" c.s. gate valve	20	EA	Included											
C	Remove 2" c.s. gate valve	20	EA	Included											
C	Remove 1" c.s. gate valve	9	EA	Included											
C	Remove 1" c.s. check valve	2	EA	Included											
C	Remove 2-1/2" c.s. check valve	2	EA	Included											
C	Remove 4" c.s. check valve	1	EA	Included											
20															
C	Remove 1/2" c.s. gate valve	14	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
C	Remove 2" c.s. gate valve	4	EA	Included											
40															
C	Remove 1/2" c.s. gate valve	2	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
C	Remove 1/2" pipe	750	LF	0.04	60	20.25					$1,220				$1,220
C	Remove 3/4" pipe	750	LF	0.04	60	20.25					$1,220				$1,220
C	Remove 1-1/2" pipe	750	LF	0.04	60	20.25					$1,220				$1,220
C	Remove 2" pipe	500	LF	0.053	53	20.25					$1,070				$1,070
C	Remove 2-1/2" pipe	500	LF	0.053	53	20.25					$1,070				$1,070
C	Remove 4" pipe	1100	LF	0.16	353	20.25					$7,150				$7,150
C	Remove 8" pipe	650	LF	0.18	235	20.25					$4,760				$4,760
C	Remove 12" pipe	1240	LF	0.20	497	20.25					$10,060				$10,060
C	Piping material bulk Pipe:$100K/($140.46*.60)*(308.2cf)=355.7cf/$100K $266,250/$100,00=2.6625*355.7=947.05cf	947	CF	0.01	28	20.25					$570				$570
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		1,399	20.23					28,300				28,300

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
15	**Instrumentation**														
mC	Remove pneumatic actuated valves	20	EA	Included											
mC	Remove flow/density trans. sensor	4	EA	Included											
mC	Remove level switches	18	EA	Included											
mC	Remove level transmitter	7	EA	Included											
mC	Remove instr. piping for valves	20	EA	Included											
mC	Remove instr. piping for transmitter	7	EA	Included											
mC	Remove instr. piping for flow trans.	4	EA	Included											
mC	Remove pressure switch	2	EA	Included											
mC	Remove flow switch	2	EA	Included											
mC	Remove pressure indicator	10	EA	Included											
mC	Remove flow indicator	8	EA	Included											
16															
mC	Remove pneumatic actuated valves	10	EA	Included											
mC	Remove flow/density trans. sensor	2	EA	Included											
mC	Remove level switches	6	EA	Included											
mC	Remove level transmitter	3	EA	Included											
mC	Remove instr. piping for valves	10	EA	Included											
mC	Remove instr. piping for transmitter	3	EA	Included											
mC	Remove instr. piping for flow trans.	2	EA	Included											
mC	Remove pressure switch	2	EA	Included											
mC	Remove flow switch	2	EA	Included											
mC	Remove orifice plate	1	EA	Included											
17															
mC	Remove diff. pressure trans.	4	EA	Included											
mC	Remove instr. piping for trans.	4	EA	Included											
18															
mC	Remove pneumatic actuated valves	18	EA	Included											
mC	Remove flow transmitter	3	EA	Included											
mC	Remove orifice plate	5	EA	Included											
mC	Remove level control valve	4	EA	Included											
mC	Remove level switches	18	EA	Included											
mC	Remove level transmitter	5	EA	Included											
mC	Remove ph element/ transmitter	4	EA	Included											
mC	Remove conduit	2000	LF	0.033	126	20.25					$2,550				$2,550
mC	Remove cable tray	600	LF	0.021	24	20.25					$490				$490
mC	Pipe tubing	1000	LF	0.04	77	20.25					$1,560				$1,560
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		227	$2026					$4,600				$4,600

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DETAIL ESTIMATE WORKSHEETS

PROJE. Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
18	Instrumentation														
mC	Remove temperature indicator/ transmitter	6	EA	Included											
mC	Remove instr. piping for valves	18	EA	Included											
mC	Remove process pipe for level trans.	5	EA	Included											
mC	Remove instr. pipe for flow transmitter	3	EA	Included											
mC	Remove indicator	7	EA	Included											
mC	Remove temperature indicator	5	EA	Included											
mC	Remove flow indicator	1	EA	Included											
73															
mC	Remove HVAC controls	1	LOT	20	38	20.25					$770				$770
76															
mC	Remove HVAC controls	1	LOT	20	38	20.25					$770				$770
90															
mC	Remove DCS	1	EA			20.25									
mC	Remove motor operated valves	4	EA			20.25									
92															
mC	Remove fire alarm & evacuation system	1	LOT	40	77	20.25					$1,560				$1,560
93															
mC	Remove real time SOx monitor	1	EA	2	4	20.25					$80				$80
mC	Remove hps control station	1	EA	2	4	20.25					$80				$80
mC	Remove auto radio counter	2	EA	2	8	20.25					$160				$160
mC	Remove passive radon monitor	9	EA	2	34	20.25					$690				$690
mC	Remove radon working lvl monitor	6	EA	2	23	20.25					$470				$470
mC	Remove body frisker	3	EA	2	11	20.25					$220				$220
mC	Remove air sampling station (CAM)	12	EA	2	46	20.25					$930				$930
mC	Remove tool comtam. monitor	2	EA	2	8	20.25					$160				$160
mC	Remove 8" butterfly valves	30	EA	2	115	20.25					$2,330				$2,330
73	HVAC STACK														
mC	Remove isokinectic monitor	1	EA	10	19	20.25					$380				$380
18	OFF-GAS STACK														
mC	Remove isokinectic monitor	1	EA	10	19	20.25					$380				$380
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		444	20.27					$9,000				$9,000

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08/20/99

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Electrical														
mC	480v pr. &mtr. feeders 19ea*500#	4.75	tn	20	182	20.25					$3,690				$3,690
mC	Conduit & wiring 4" & <	60500	lf	0.016	1854	20.25					$37,540				$37,540
mC	480v distribution MCC 1000# * 5ea	2.5	tn	20	96	20.25					$1,940				$1,940
mC	Transformer 3750kv 1ea * 2000#	1	tn	20	38	20.25					$770				$770
mC	Utility metering cabinet 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Generator 700kw 1ea * 1ton	1	tn	20	38	20.25					$770				$770
mC	Transfer switch 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Stl. pole <18"dia 40'long 20ea.	4	tn	20	153	20.25					$3,100				$3,100
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		2,381	$20.24					$48,200				$48,200

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Estimate
Project: C4981201R2
Client: Vit 1 D&D Combustion Melter Heater
WBS: DOE
2.1.3.G.P

COST IMPA ATRIX SHEET

FLUOR DANIEL FERNALD ESTIMATING SERVICES

Date: 20-Aug-99
Estimator: Wagner
Location: FERNALD
TASK NO.: 4S11B

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
$5,121,060	Mobilization Cost labor		Mobilization Cost mati		Mobilization Cost equip		Below Grade labor		PPE ppe		Above Grade labor	
Cost Drivers	Base $	$56,950	Base $	$129,950	Base $	$140,320	Base $	$509,580	Base $	$232,620	Base $	$2,873,160
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor							-5%	15%			-5%	20%
Material Pricing			-5%	15%								
Equipment Rental					-5%	15%						
Subcontract $'s												
Quantity Variation			-5%	10%	-5%	10%						
Contamination							-5%	15%	-5%	15%		
Environmental												
Schedule							-5%	10%	-5%	10%	-5%	10%
Project Definition	-10%	25%					-15%	40%	-10%	25%		
Range - %	-10%	25%	-10%	25%	-10%	25%					-10%	30%
Range - $	$51,255	$71,188	$116,955	$162,438	$126,288	$175,400	$433,143	$713,412	$209,358	$290,775	$2,585,844	$3,735,108
Distribution	U		U		U		U		U		U	
Correlation Rank												

Cost Drivers	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Demobilization Cost labor		Demobilization Cost s/c		Demobilization Cost mati		Demobilization Cost equip					
	Base $	$119,130	Base $	$176,360	Base $	$23,540	Base $	$859,450	Base $	$0	Base $	$0
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor	-5%	20%			-5%	15%						
Material Pricing												
Equipment Rental												
Subcontract $'s			-5%	15%			-5%	15%				
Quantity Variation												
Contamination												
Environmental												
Schedule	-5%	10%										
Project Definition			-5%	10%	-5%	10%	-5%	10%				
Range - %	-10%	30%	-10%	25%	-10%	25%	-10%	25%	0%	0%	0%	0%
Range - $	$107,217	$154,869	$158,724	$220,450	$21,186	$29,425	$773,505	$1,074,313	$0	$0	$0	$0
Distribution	U		U		U		U					
Correlation Rank												

Analyst: _____

Client: _____

08/20/99

CONTRACTOR - Stated in FY99 DOLLARS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

SITE SPECIFIC

EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			80.0%	20.0%	0.16
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE	<---- MULTIPLE SHIFTS-			200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
WORK WEEK							4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK	//////// MULTIPLE-SHIFT ////////			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK 2ND SHIFT 3RD SHIFT			3RD SHIFT		2ND SHIFT		OR ONE SHIFT ONLY			100.0% 100.0%	3.0% 5.0%	0.03 0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	89.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 89.4%

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.12

CONTRACTOR - Stated in FY99 DOLLARS

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EFFICIENCY FACTORS

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PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	12%	12.0
S/T = BASE UNIT MANHOURS		112
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		112
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		112

• PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	23.00%	26	71.00%	80	79.00%	88	147.00%	165	326.00%	365
(AS A MULTIPLIER)/TOTAL HRS	1.23	137.8	1.71	191.5	1.79	200.5	2.47	276.6	4.26	477.1
TOTAL MULTIPLIER w/SITE PROD.	1.3776		1.9152		2.0048		2.7664		4.7712	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

	14.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	48.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: [illegible]99
ESTIMATOR: Wag[illegible]
LOCATION: FERN[illegible]
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.81	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.23	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DA 4 - 10's		600	600	600	600	600
ADDITN'L SITE SAFETY MEETINGS NOT INCLD. IN BASE	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING	QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS	QUANTITY	2	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		30	30	30	30	45
MOBILIZATION - ROUND TRIPS	QUANTITY	4	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		60	60	60	60	60
COOLDOWNS PER DAY	QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS) 33.33%	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		485	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

000370

APPENDIX "C"

HEALTH PHYSICS

8113

PROJECT:
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CA		$'s	*	MAN DAYS	MAT'L.$'s	PPE LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1473	$19,709	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1473	$19,709	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	3	1473	$1,061	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	1473	$1,149	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	1473	$4,507	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	3	1473	$51,879	C / C+/ B	
SUB-TOTAL		22.18	3		$98,014		
				$/MD =	$66.54		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	PPE LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & B	PR	4.46	3	3762	$50,336	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	3762	$2,709	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	3762	$2,934	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	3762	$11,512	mC
SUB-TOTAL		5.98	3		$67,491	
				$/MD =	$17.94	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	0	$0	C/B
THERMO STRIPS	EA	50.00	6	0	$0	C/B
SUB-TOTAL					$0	

MAT'L.$'s
$165,500

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDE AS PART OF PROJECT COSTS AT THIS TIME.

000371

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
LIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagne
LOCATION: FERNA
TASK NO.: 4S11B

--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	53	212	$20.27	$4,300
ANNUAL PHYSICALS	0	4	53	0	$20.27	$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	53	53	$20.27	$1,070
SUB-TOTAL						$5,370

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	6	1	53	296	$20.27	$6,010
SUB-TOTAL						$6,010

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR $'s	
	48	2	96	$20.27	$1,900	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CON WORKING DAYS
2340	226	10	0.004274	53	0.2265	212

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	1.0%	$1,617,580	$16,200
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	1.0%	$1,617,580	$16,200

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$45,700	$165,500	$211,200

\ESTIMATE\SILOS\VIT_1\VIT_1R2.WK4

000372

APPENDIX "C"

HEALTH PHYSICS - 8113

PROJECT:
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CA		$'s	*	MAN DAYS	MAT'L.$'s	PPE LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1473	$19,709	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1473	$19,709	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	3	1473	$1,061	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	1473	$1,149	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	1473	$4,507	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	3	1473	$51,879	C / C+/ B	
SUB-TOTAL		22.18	3		$98,014		
				$/MD =	$66.54		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	PPE LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & B	PR	4.46	3	3762	$50,336	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	3762	$2,709	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	3762	$2,934	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	3762	$11,512	mC
SUB-TOTAL		5.98	3		$67,491	
				$/MD =	$17.94	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	0	$0	C/B
THERMO STRIPS	EA	50.00	6	0	$0	C/B
SUB-TOTAL					$0	

MAT'L.$'s
$165,500

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDE AS PART OF PROJECT COSTS AT THIS TIME.

000373

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNA
TASK NO.: 4S11B

--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	53	212	$20.27	$4,300
ANNUAL PHYSICALS	0	4	53	0	$20.27	$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	53	53	$20.27	$1,070
SUB-TOTAL						$5,370

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	6	1	53	296	$20.27	$6,010
SUB-TOTAL						$6,010

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR $'s
	48	2	96	$20.27	$1,900

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONS WORKING DAYS
2340	226	10	0.004274	53	0.2265	212

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	1.0%	$1,617,580	$16,200
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	1.0%	$1,617,580	$16,200

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$45,700	$165,500	$211,200

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000374

ACTIVITY DURATIONS

8113

FLUOR DANIEL FERNALD

PROJECT: Vit 1 D&D Combustion Melter Heater
ESTIMATE NO.: C4981201R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	29-Dec-98	01-Jan-2009	20-Jun-2009	07-Dec-2009	11.2	MONTHS
					0	MONTHS
TOTAL					11.2	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	125.9	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS					0	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

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000375

ESTIMATE SUMMARY SHEET

PROJECT:	Vendor "B" (TTA/RCS D & D)	DATE:	20-Aug-99
ESTIMATE NO.:	C4981003	ESTIMATOR:	T Wagner
CLIENT:	DOE	LOCATION:	FERNA[illegible]
.BS NO.:	2.1.3.G.0	TASK NO.:	4SWRA[illegible]

FLUOR DANIEL FERNALD

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO.7	Premobilization/Mobilization	820		$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System	1,140		$23,100				$23,100
II	RCS Phase I, II, & III	1,743		$35,300				$35,300
III	Silo Waste Retrieval System	2,204		$44,600				$44,600
IV	Transfer Tank Area	4,520		$91,500				$91,500
	Demobilization Cost	1,400		$28,800	$8,200	$2,500	$3,500	$43,000
DIRECT FIELD COSTS TOTAL		11,827	$20.35	$240,700	$8,200	$16,300	$4,300	$269,500
SUPERVISION - CONTRACTOR - STAFF		8,960		$209,800				$209,800
SMALL TOOLS & CONSUMABLES @ 3%						$7,200		$7,200
MISC. EQUIP. RENTAL (See Equipment Schedule)							$278,400	$278,400
PERDIEM / SUBSISTANCE					$76,800			$76,800
TEMPORARY FACILITIES & UTILITIES		532		$10,800		$10,800		$21,600
JOB CLEAN-UP 6%		532		$10,800		$3,600		$14,400
SAFETY 3%		231		$4,700		$2,500		$7,200
HEALTH PHYSICS S/C		1,145		$23,300		$11,000		[illegible]
ERCLA - 40 HRs/FTE		760		$15,500				[illegible]
GET/SITE ACCESS & JOB SPECIFIC TRAINING		380		$7,700				$7,700
PAYROLL BURDENS & BENEFITS		-	-	$298,300				$298,300
OVERHEAD & PROFIT		-	-		$248,100			$248,100
BOND		-	-		$14,900			$14,900
SALES TAX		-	-			$3,100	$17,000	$20,100
INDIRECT FIELD COSTS TOTAL		12,540		$580,900	$339,800	$38,200	$295,400	$1,254,300
DIRECT & INDIRECT FIELD COSTS TOTAL		24,367	$33.72	$821,600	$348,000	$54,500	$299,700	$1,523,800
WASTE DISPOSITION - MGMT. - FD FERNALD				$1,431,356	$2,396,284	$3,503,822	$56,950	$7,388,411
WASTE MANAGEMENT COSTS TOTAL				$1,431,400	$2,396,300	$3,503,800	$56,900	$7,388,400
PROJECT MANAGEMENT - FLUOR DANIEL FERNALD				$963,200	$117,300	$26,600		$1,107,100
FIELD PREPARATION								
PROJECT CLOSE OUT				$94,200	$3,100			$97,300
FD-FERNALD FIELD SUPPORT COSTS TOTAL				$1,057,400	$120,400	$26,600		$1,204,400
ENGINEERING, PLANNING, PROCUREMENT - FLUOR DANIEL FERNALD				$123,800	$9,500	$6,700		$140,000
ENGINEERING, PLANNING & PROCUREMENT COSTS TOTAL				$123,800	$9,500	$6,700		$140,000
SALES TAX - FLUOR DANIEL FERNALD						$212,200		$212,200
SUB-TOTAL (BASE ESTIMATE)								$10,468,800
RISK BUDGET 7.0%								$106,700
TARGET ESTIMATE - ITEM NO.7					(FY 99 DOLLARS)			$10,575,500
NTS BURIAL FEE ITEM NO.30								$6[illegible]4

TIMATE PERFORMED BY ESTIMATING SERVICES

F:\123[illegible]X4

000376

DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost				820						$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System				1,140						$23,100				$23,100
II	RCS Phase I, II, & III				1,743						$35,300				$35,300
III	Silo Waste Retrieval System				2,204						$44,600				$44,600
IV	Transfer Tank Area				4,520						$91,500				$91,500
	Demobilization Cost				1,400						$28,800	$8,200	$2,500	$3,500	$43,000
	Subtotal Direct Cost	1	LOT		11,827						$240,700	$8,200	$16,300	$4,300	$269,500

000377

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Utilities to Building	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list Items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		500	20.27			1500	3.50	$10,140		$1,500	$1,800	$13,440
D	Remove Electrical to Trailer	1	lot		120	21.12				300	$2,530			$310	$2,840
D	Remove Utilitries to Building	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000.00			$3,240	$8,220			$11,460
	Total				1,400						$28,800	$8,200	$2,500	$3,500	$43,000

000378

DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	Sub Item	Description	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
I	Full Scale Mock-up System						20.25									
D	A	Blower Skid	0.2	tn	150	41	20.25					$830				$830
D	B	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
	C	Waste Retrieval Equipt					20.25									
D		- Pipe Bridge from Silo 4 to TTA	15	tn	9	186	20.25					$3,770				$3,770
D		Sluicer Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Deployment Equipment	3	tn	40	165	20.25					$3,340				$3,340
D		Retrieval Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Discrete Object Housing	1.5	tn	40	83	20.25					$1,680				$1,680
D		CATS Housing	1	tn	60	83	20.25					$1,680				$1,680
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
D		Piping	700	lf	0.105	101	20.25					$2,050				$2,050
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		CAmera System	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	104						$2,100				$2,100
		Subtotal Direct Cost		LOT		1,140	20.26					23,100				$23,100

000379

81113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II, & III															
D	A	Building - Concrete (3801f	355	cy	1.400	685	20.25					$13,870				$13,870
C	B	Equipt - Carbon Beds	9.2	tn	7	129	20.25					$2,610				$2,610
C		- Fans	0.4	tn	7	6	20.25					$120				$120
C		- HEPA Filters	0.7	tn	7	10	20.25					$200				$200
C		- Chillers	4	tn	7	56	20.25					$1,130				$1,130
C		- Condensate Pumps	0.4	tn	7	6	20.25					$120				$120
C		- Holdup Tank	2	tn	7	28	20.25					$570				$570
C		- Transfer Pump	0.6	tn	7	8	20.25					$160				$160
D		Metal Platform	1	tn	7	10	20.25					$200				$200
D		Ext. Metal Ladder	0.2	tn	7	2	20.25					$40				$40
C	C	Ductwork - HVAC - 6"	400	lf	0.127	102	20.25					$2,070				$2,070
C		- Stack - 24"	150	lf	0.151	45	20.25					$910				$910
C		- Climate Control Unit Htrs	0.8	tn	7	8	20.25					$160				$160
C	D	Electrical - MCC	0.4	tn	7	6	20.25					$120				$120
C		- Local Load Cntr	0.1	tn	7	1	20.25					$20				$20
C		- 480 V SWGR	0.3	tn	7	4	20.25					$80				$80
C		- Lighting	0.1	tn	7	1	20.25					$20				$20
C		- Alarms	0.1	tn	7	1	20.25					$20				$20
C		- Rad Detectors	0.1	tn	7	1	20.25					$20				$20
C		Conduit (small)	500	lf	0.021	21	20.25					$430				$430
C		Cable Trays	100	lf	0.033	7	20.25					$140				$140
		Take-off Allowance			10%	114						$2,300				$2,300
		Subtotal Direct Cost	1	LOT		1251	20.22					25,300				$25,300

000380

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II, & III con't.															
C	E	Piping - 4" avg	600	lf	0.053	64	20.25					$1,300				$1,300
D		Concrete Slab @ Grade @1'	111	cy	0.459	70	20.25					$1,420				$1,420
D		Concrete Slab Elevated @ 1'	50	cy	3.603	248	20.25					$5,020				$5,020
D		Coated Concrete Walls 2"	37	cy	0.400	20	20.25					$410				$410
D		Footers	90	cy	0.366	45	20.25					$910				$910
		Take-off Allowance			10%	45						$910				$910
		Subtotal Direct Cost	1	LOTS		492	20.33					$10,000				$10,000

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III.	Silo Waste Retrieval System															
D	A	Pivoting Bridge	11	tn	7	106	20.25					$2,150				$2,150
D	B	Center Foundation	26	cy	0.400	14	20.25					$280				$280
D	C	Curved Plate Foundations	67	cy	0.400	37	20.25					$750				$750
D	D	Structural Truss & Tower	11	tn	7	106	20.25					$2,150				$2,150
D		Tower #2	2	tn	10	28	20.25					$570				$570
D		Curved Plate for Glide Track	12	tn	7	116	20.25					$2,350				$2,350
	E	Retrieval Equipt & Housing:					20.25									
C		• Sluicer Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		• Deployment Equipment	3	tn	40	241	20.25					$4,880				$4,880
C		• Retrieval Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		• Discrete Object Housing	1.5	tn	40	120	20.25					$2,430				$2,430
C		• CATS Housing	1	tn	7	14	20.25					$280				$280
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
C		Piping	700	lf	0.053	74	20.25					$1,500				$1,500
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		Pipe Bridge @35'h w/ 40' spans conc ftg	15	tn	7	145	20.25					$2,940				$2,940
C		RCS Round Duct	600	lf	0.127	153	20.25					$3,100				$3,100
C	F	Transfer Line (Silo to TTA) - 2"	300	lf	0.040	24	20.25					$490				$490
C	G	Air Equipt (for Air Track) - 2"	500	lf	0.040	40	20.25					$810				$810
C		Air Compressor	0.2	tn	7	3	20.25					$60				$60
C	H	Water Supply System 2"	500	lf	0.040	40	20.25					$810				$810
C		Hydraulic Line 2"	200	lf	0.040	16	20.25					$320				$320
D		Conduits	900	lf	0.033	41	20.25					$830				$830
	Take-off Allowance				10%	171						$3,460				$3,460
	Subtotal Direct Cost		1	LOT		1,881	20.26					38,100				$38,100

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III	Silo Waste Retrieval System con't.															
D	I	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
D	J	Trailers - Decon	6	tn	7	58	20.25					$1,170				$1,170
D		- Storage	6	tn	7	58	20.25					$1,170				$1,170
D		- Office	6	tn	7	58	20.25					$1,170				$1,170
D		- Break	6	tn	7	58	20.25					$1,170				$1,170
D	L	Camera System	0.4	tn	7	4	20.25					$80				$80
		Take-off Allowance			10%	29						$590				$590
		Subtotal Direct Cost	1	LOT		323	20.12					6,500				$6,600

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
IV	Transfer Tank Area															
C	A	Storage Tanks 66'dia x 30'h	220	tn	2.700	1181	20.25					$24,120				$24,120
C	B	Decant Tank 38'dia x 30'h	34.2	tn	2.700	185	20.25					$3,750				$3,750
D	C	Structure w/Metal Roof	112.5	tn	2.700	418	20.25					$8,460				$8,460
D		w/ 12" concrete Floor	833	cy	0.459	527	20.25					$10,670				$10,670
D		w/ 2' concrete Walls	1600	cy	0.400	882	20.25					$17,860				$17,860
D		w/ 9" R/I conc Slab - Operating Deck (Par	625	cy	0.459	395	20.25					$8,000				$8,000
D		Concrete footers	266	cy	0.366	134	20.25					$2,710				$2,710
D	D	Sampling System Enclosure @2' thick	104	cy	0.400	57	20.25					$1,150				$1,150
D		Slurry Sample & Storage Bldg (3 Walls &	55	cy	0.400	30	20.25					$610				$610
D	E	Raw Water Tank	3.2	tn	3	12	20.25					$240				$240
	F	Mechanical Systems - Pumps														
C		- TTA Transfer	0.4	tn	7	6	20.25					$120				$120
C		- Makeup Water	0.1	tn	7	1	20.25					$20				$20
C		- Sump	0.1	tn	7	1	20.25					$20				$20
C		- Sluice	0.1	tn	7	1	20.25					$20				$20
C		- HPU Pump	0.1	tn	7	1	20.25					$20				$20
C		- Piping	750	lf	0.053	80	20.25					$1,620				$1,620
D	G	Electrical - MCC #2	3	cy	0.459	2	20.25					$40				$40
D	H	Lighting , Conduit	2000	lf	0.033	91	20.25					$1,840				$1,840
D		Cable Tray	500	lf	0.021	14	20.25					$280				$280
D	J	Heat (personal) Unit Htrs	0.4	tn	7	4	20.25					$80				$80
C	K	Ductwork	300	lf	0.127	76	20.25					$1,540				$1,540
C	M	Decant Sump	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	411						$8,320				$8,320
		Subtotal Direct Cost	1	LOT		4,520	20.24					$91,500				$91,500

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C.3.6 Project Management Estimate Basis: Vitrification — Other

C.3.6.1 Introduction

The project management cost estimate is summarized in **Table C.3.6-1.**

The project management cost for the Vitrification — Other alternative was prepared as detailed estimates based on Silos Project FY98 actuals, and the current Silos Project organizational charts.

TABLE C. 3.6-1
TOTAL PROJECT MANAGEMENT COST

Annual FDF Project Management Cost	$2,115,160
Silos 1 and 2 Remediation Project Schedule Duration	10.5 years
Total Project Management Cost	$22,145,800

C.3.6.2 Estimate Basis

The cost estimate basis for the project management cost of the Vitrification — Other alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.3.6.2.1 Assumptions

The following general assumptions were used in the preparation of the project management estimates:

1. Costs are expressed in FY99 dollars.
2. FDF project management labor is based on the current Silos Project organizational structure.
3. Throughout the project, FDF project management labor is 100% dedicated in support of the Silos 1 and 2 material full-scale remediation project.
4. Labor cost is based on a 40-hr/week schedule.
5. FDF project management for the Silos 1 and 2 material remediation project is a level-of-effort support throughout the project duration from FY00 thru FY10.

C.3.6.2.2 Inclusions

The project management cost estimate includes the following cost elements:

- Project management labor; and
- Project management office supplies.

C.3.6.2.3 Exclusions

The following elements of cost are excluded from the project management cost estimate:

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- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc.);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation O&M; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.3.6.2.4 Format and Coding

The project management cost estimates are compiled and summarized into the following cost centers:

- FDF labor; and
- Material.

The following discussion provides a brief description of the cost centers.

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

Material Cost

Material cost is the cost for office supplies.

C.3.6.2.5 Methodology

The following methods were used to prepare the project management cost estimate:

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using Silos Project FY98 actuals and the current Silos Project organizational structure. The FY99 plan labor rates were then applied to the labor resources to obtain the FDF project management labor cost estimate.

Material Cost

The material cost estimate is based on the Silos Project FY98 project management actual material cost.

C.3.6.2.6 References

The following references were used to prepare the project management cost estimate:

- Silos Project Organization Charts, dated July 23, 1999; and
- FY98 12-month spread for control account 4PM1A , "Project Management" from the FEMP project control system.

C.3.6.2.7 Attachment

The detailed project management cost summary for the Vitrification — Other (VIT2) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.3.6.I

Project Management Cost Estimate Summary for

Vitrification — Other

DETAIL ESTIMATE WORKSHEETS

PROJECT: C4981001
ESTIMATE Silos 1 & 2 Combustion Vitrify (FS)
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

TEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
23	PROJECT MANAGEMENT														
	Project Manager	1	ea	21,840	21840	100.00					2,184,000				$2,184,000
	Adminstration Assistand	2	ea	21,840	43680	49.00					2,140,320				$2,140,320
	Contract Adminstrator	1	ea	21,840	21840	43.00					939,120				$939,120
	Contract Technical Represen	1	ea	21,840	21840	49.00					1,070,160				$1,070,160
	Site Integration	1	ea	21,840	21840	49.00					1,070,160				$1,070,160
	Environmental Compliance	1	ea	21,840	21840	45.00					982,800				$982,800
	Clerical	2	ea	21,840	43680	23.00					1,004,640				$1,004,640
	Quality Manager	1	ea	21,840	21840	60.00					1,310,400				$1,310,400
	Quality Engineer	2	ea	21,840	43680	44.00					1,921,920				$1,921,920
	Project Controls Manager	1	ea	21,840	21840	60.00					1,310,400				$1,310,400
	Project Controls Scheduler	1	ea	21,840	21840	42.00					917,280				$917,280
	Project Controls Cost	1	ea	21,840	21840	42.00					917,280				$917,280
	Project Engineering Manager	1	ea	21,840	21840	60.00					1,310,400				$1,310,400
	Project Engineers	2	ea	21,840	43680	54.50					2,380,560				$2,380,560
	Readiness Coordiinator	1	ea	21,840	21840	42.50					928,200				$928,200
	Training Coordinator	1	ea	21,840	21840	42.50					928,200				$928,200
	Material Cost	1	lot						830,000				830,000		$830,000
	Take-off Allowance														
	Total Direct cost - ITEM No. 2	1	LOT		436,800	$48.80					21,315,800		830,000		$22,145,800

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C.3.7 Waste Disposal Cost Estimate

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C.3.7.1 Introduction

The waste disposal costs for the Vitrification — Other (VIT2) alternative are summarized in **Table C.3.7-1**.

TABLE C. 3.7-1
WASTE DISPOSAL COST
VITRIFICATION — OTHER

Waste Disposal Containers Cost	$11,404,550
Transportation Cost	$4,540,200
NTS Burial Cost	$3,324,080
Risk Budget	$829,150
Total Waste Disposal Cost Estimate	$20,097,980

The waste disposal cost estimate for the Vitrification — Other (VIT2) alternative was prepared based on the waste loading assumptions documented in the **Basis of Design and Description (Appendix G)**, quotes for containers and transportation services, and FY99 NTS volumetric burial fees.

C.3.7.2 Estimate Basis

The cost estimate basis for the waste disposal cost of the Vitrification — Other (VIT2) alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.3.7.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY99 dollars.
2. The wasteform produced by the Vitrification — Other process is a glass frit, with a packing fraction of 50%.
3. Waste loading within the glass frit is 87 wt%.
4. Mode of transportation to the NTS is via truck.
5. Truckload capacity is 42,000 lb.
6. The wasteform produced by the Vitrification — Other process has 1% out of specification glass requiring rework.
7. The treated Silos 1 and 2 material is disposed at the NTS.
8. The treated Silos 1 and 2 material meets the NTS WAC.

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C.3.7.2.2 Inclusions

The waste disposal cost estimate includes the cost of the following elements:

- Shipping containers;
- Shipment of the treated Silos 1 and 2 material via truck to the NTS; and
- Disposal at the NTS.

C.3.7.2.3 Exclusions

The waste disposal cost estimate excludes the following elements:

- Silos 1 and 2 material treatment facility capital cost;
- D&D cost;
- Disposal cost of D&D debris;
- Cost of operation of AWWT and other site support functions (security, fire department, etc.);
- Silos 1 and 2 material remediation O&M; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.3.7.2.4 Format and Coding

The waste disposal estimates is compiled and summarized into the following cost centers:

- Waste disposal container;
- Transportation;
- NTS burial;
- Risk budget; and
- Secondary waste.

C.3.7.2.4.1 Waste Disposal Container Cost

Waste disposal container costs are the costs for shipping containers and liners.

C.3.7.2.4.2 Transportation Cost

Transportation cost is FDF's cost for transporting the treated Silos 1 and 2 material to the NTS.

C.3.7.2.4.3 Burial Cost

Burial costs are the costs for the burial and management of the Silos 1 and 2 material disposed at the NTS.

C.3.7.2.4.4 Risk Budget

Risk budget is added to the estimate for risks and uncertainties associated with waste loading, packaging and transportation.

C.3.7.2.4.5 Secondary Waste Cost

Secondary waste cost is defined as those costs for the treatment, sizing, packaging, transportation and disposal of the solid secondary waste generated during Silos 1 and 2 waste remediation operation.

C.3.7.2.5 Methodology

The methods used to prepare the waste disposal cost estimate are discussed next.

Waste Disposal Container Cost

The shipping container cost estimate is based on quotes for using a SEG design, high-density, concrete with steel fiber. This container does not have the same dimensions as the certified SEG container; but, its cost is assured to be close to the cost of the SEG container because it's similar in design and materials.

Table C.3.7-2 presents a summary of the containers required to dispose the treated Silos 1 and 2 material at the NTS.

TABLE C. 3.7-2
WASTE DISPOSAL CONTAINER SUMMARY

Container	QTY	Unit Cost	Total Cost
Shipping/Disposal	2,162	$5,275	$11,404,550

Transportation Cost

A total of 1,081 truck shipments is required to transport the treated Silos 1 and 2 material to the NTS. The transportation cost estimate is based on FY99 average shipping costs, via truck, to the NTS. The transportation cost estimate is $4,200 per truck shipment.

NTS Burial Cost

The burial cost estimate is based on the FY99 burial rate negotiated between FEMP and the NTS. The burial cost estimate is based on a volumetric rate of $7.50 per cubic feet of Silos 1 and 2 material disposed.

Risk Budget

The risk budget was calculated based on the potential risk associated with waste loading, shipping and waste disposal. The risk factor was determined by the FDF team based on historical data and professional judgement and documented in meeting minutes (see **Table C.3.4-9**).

Secondary Waste Cost

The secondary waste cost is estimated as the volume of the spare parts, filter, and PPE material cost. All secondary waste is packaged and disposed of at the NTS.

C.3.7.2.6 References

- **Basis of Design and Description (Appendix G).**
- *POP Final Report* **(Appendix H, Attachment H2).**

C.3.7.2.7 Attachments

The detailed Silos 1 and 2 material disposal cost summaries for the Vitrification - Other (VIT2) alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.3.7.I

Silos 1 and 2 Material Disposal Cost Summary for

Vitrification — Other

DETAIL ESTIMA[illegible] WORKSHEETS

PROJECT:C4981001
ESTIMATESilos 1 & 2 Combustion Vitrify (FS)
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATJ. ELLIS
LOCATIOFERNALD
TASK NO4S11B

TEM NO.	Waste Disposal	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
22	WASTE DISPOSAL	2162	ea	1.00				2100.00	5,275			4,540,200	11,404,550		$15,944,750
31	NTS Costs	2162	ea	1.00				1537.50				3,324,080			$3,324,080

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VITRIFICATION - OTHER
WASTE DISPOSAL
($1000)

ITEM	BASIS		AMOUNT
NO. OF CONTAINER		2162	
CONTAINER COST		5275	$ 11,404,550.00
TRANSPORTATION	$2100 EACH		$ 4,540,200.00
DISPOSAL	205 CU. FT. EACH @ $7.50/CU. FT.		$ 3,324,075.00
TOTAL			$ 19,268,825.00

C.3.8 Cost of Money Estimate

C.3.8.1 Cost of Money Analysis

Cost of money is the cost incurred by the Silos 1 and 2 full-scale remediation contractor to finance the engineering cost, start-up cost, and capital cost. This cost assumes that the contract for the Silos 1 and 2 remediation project will be structured similar to the Silo 3 project contract, which shifts the financial liability and risk of the project to the contractor. Thus, the contract requires the contractor to finance engineering, capital, and start-up costs and be reimbursed on a predetermined, pay item schedule once operations are successful.

The cost of money in **Table C.3.8-1** was calculated by establishing a contractor's cash output and cash input schedule and applying a finance rate of 8.0%. The Silos 1 and 2 project remediation schedule in **Figure 3.4-3** was used as the basis for activity durations.

TABLE C. 3.8-1
COST OF MONEY
VITRIFICATION — OTHER

Cost of Money	$37,125,498

C.3.8.2 Attachment

The cost of money analysis summary for the Vitrification — Other (VIT2) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.3.8.I

Cost of Money Estimate for

Vitrification — Other

Combustion (other) Vitrification

FLUOR DANIEL FERNALD
FULL SCALE REMEDIATION
COST OF MONEY MODEL
SILOS 1 & 2 COMBUSTION (OTHER) VIT (F/S)
SUBCONTRACTOR "PAY OUT" SCHEDULE

Pay Item Number	Description	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 Dollars)	$25,728,900	$8,576,300	$8,576,300	$8,576,300						
	TOTAL 1.0 (in ESCALATED Dollars)	$28,702,087	$9,299,762	$9,562,063	$9,840,261	$0	$0	$0	$0	$0	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 Dollars)	$61,748,443			$30,874,222	$30,874,222					
	TOTAL 2.0 (in ESCALATED Dollars)	$71,850,328	$0	$0	$35,424,415	$36,425,913	$0	$0	$0	$0	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 Dollars)	$1,164,330				$1,164,330					
	TOTAL 3.0 (in ESCALATED Dollars)	$1,361,897	$0	$0	$0	$1,361,897	$0	$0	$0	$0	$0
4.0	PRE-OPERATIONAL ASSESSMENT										
	TOTAL 4.0 (in 99 Dollars)										
	TOTAL 4.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 Dollars)	$52,572,320					$13,143,080	$17,524,107	$17,524,107	$4,381,027	
	TOTAL 5.0 (in ESCALATED Dollars)	$66,171,288	$0	$0	$0	$0	$15,957,119	$21,893,329	$22,526,741	$5,794,099	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Dollars)										
	TOTAL 6.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Dollars)	$25,522,200								$12,761,100	$12,761,100
	TOTAL 7.0 (in ESCALATED Dollars)	$34,239,129	$0	$0	$0	$0	$0	$0	$0	$16,877,111	$17,362,018
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Dollars)										
	TOTAL 8.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN 99 DOLLARS	$166,726,193	$8,576,300	$8,576,300	$39,450,521	$32,028,552	$13,143,080	$17,524,107	$17,524,107	$17,142,127	$12,761,100
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN ESCALATED DOLLARS	$202,324,729	$9,299,762	$9,562,063	$45,264,676	$37,787,810	$15,957,119	$21,893,329	$22,526,741	$22,671,210	$17,362,018
			$8,576,300	$17,152,600	$56,603,121	$88,631,673	$101,774,753	$119,298,860	$136,822,966	$153,965,093	$166,726,193

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Combustion (other) Vitrification

SUBCONTRACTOR "PAY IN" SCHEDULE

Pay Item Number	Description	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 Dollars)	$25,728,900		$0	$0	$0		$12,864,450	$6,432,225	$6,432,225	
	TOTAL 1.0 (in ESCALATED Dollars)	$32,847,238	$0	$0	$0	$0	$0	$16,071,897	$8,268,443	$8,506,898	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 Dollars)	$61,748,448				$0	$0	$30,874,222	$15,437,111	$15,437,111	
	TOTAL 2.0 (in ESCALATED Dollars)	$78,832,199	$0	$0	$0	$0	$0	$38,571,980	$19,843,967	$20,416,252	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 Dollars)	$1,154,330				$0	$0	$577,165	$288,583	$288,583	
	TOTAL 3.0 (in ESCALATED Dollars)	$1,473,695	$0	$0	$0	$0	$0	$721,067	$370,965	$381,663	$0
4.0	PRE-OPERATIONAL ASSESSMENT										
	TOTAL 4.0 (in 99 Dollars)										
	TOTAL 4.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 Dollars)	$52,572,320						$26,286,160	$13,143,080	$13,143,080	
	TOTAL 5.0 (in ESCALATED Dollars)	$67,117,346	$0	$0	$0	$0	$0	$32,839,994	$16,895,056	$17,382,296	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Dollars)										
	TOTAL 6.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Dollars)	$25,522,200								$12,761,100	$12,761,100
	TOTAL 7.0 (in ESCALATED Dollars)	$34,239,129	$0	$0	$0	$0	$0	$0	$0	$16,877,111	$17,362,018
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Dollars)										
	TOTAL 8.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL FOR "PAY IN" FOR PAY ITEMS	IN 99 DOLLARS	$166,726,193	$0	$0	$0	$0	$0	$70,601,997	$35,300,998	$48,062,098	$12,761,100
TOTAL FOR "PAY IN" FOR PAY ITEMS	IN ESCALATED DOLLARS	$214,509,607	$0	$0	$0	$0	$0	$88,204,938	$45,378,431	$63,564,220	$17,362,018
			$0	$0	$0	$0	$0	$70,601,997	$105,902,995	$153,965,093	$166,726,193

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Combustion (other) Vitrification

COST OF MONEY CALCULATION	COST OF MONEY RATE/YR	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
MONTHLY "PAY OUT" AMOUNTS	Prime Rate 8/4/99	$8,576,300	$8,576,300	$39,450,521	$32,028,552	$13,143,080	$17,524,107	$17,524,107	$17,142,127	$12,761,100
PLUS - YEARLY COST OF MONEY INCREME	8.00%	0	$686,104	$1,427,096	$4,697,306	$7,635,374	$9,297,651	$5,795,232	$4,836,699	$2,750,037
LESS - YEARLY " PAY IN" AMOUNTS		$0	$0	$0	$0	$0	$70,601,997	$35,300,998	$48,062,098	$12,761,100
OUTSTANDING YEARLY INCREMENTAL VALUES		$8,576,300	$9,262,404	$40,877,618	$36,725,857	$20,778,454	($43,780,239)	($11,981,660)	($26,083,273)	$2,750,037
OUTSTANDING CUMULATIVE VALUES		$8,576,300	$17,838,704	$58,716,322	$95,442,179	$116,220,633	$72,440,394	$60,458,734	$34,375,461	$37,125,498
CUMULATIVE COST OF MONEY FY99		$ 37,125,498	$0	$686,104	$2,113,200	$6,810,506	$14,445,880	$23,743,531	$29,539,763	$34,375,461	$37,125,498
CUMULATIVE COST OF MONEY		$ 115,378,631								

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C.4.0 Chemical Stabilization — Cement-based

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C.4.1 Cost Estimate Summary: Chemical Stabilization — Cement-based

C.4.1.1 Introduction

The summary cost for the Chemical Stabilization — Cement-based (CHEM1) alternative is $295,957,879 in FY99 dollars as shown in **Table C.4.1-1**.

TABLE C. 4.1-1
SUMMARY COST ESTIMATE FOR
CHEMICAL STABILIZATION — CEMENT-BASED

Section	Cost Element	Estimated Cost
C.4.2	Capital Cost	$55,277,143
C.4.3	Engineering Cost	$23,808,860
C.4.4	O&M	$76,807,294
C.4.5	D&D Cost	$33,716,309
C.4.6	Project Management Cost	$21,130,800
C.4.7	Waste Disposal Cost	$57,650,410
C.4.8	Cost of Money	$27,567,063
C.4.1	Summary Cost (Un-escalated)	$295,957,879

Supporting information for the Chemical Stabilization — Cement-based (CHEM1) cost estimate elements is provided in **Sections C.4.2** through **C.4.8**.

C.4.1.2 Attachment

The cost estimate summary for the Chemical Stabilization — Cement-based (CHEM1) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.4.1.I

Cost Estimate Summary for

Chemical Stabilization — Cement-based

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PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	RISK	LABOR	S/C	MAT'L	EQUIP	TOTAL		% / X
1	PRE-MOBILIZATION -CONTRACTOR	1	LOT								678,000				$678,000	C	
2	CAPITAL Direct/ Indirect Field Cost	1	LS								12,371,593	7,656,400	8,009,650	13,100,500	$41,138,143	C	
3	CONSTRUCTION Management	1	LS								3,711,500				$3,711,500	F	
4	ENGINEERING	1	LS									23,808,860			$23,808,860	C	
5	RISK BUDGET for Capital 14.2%	1	LS							9,749,500					$9,749,500	C	
6	DECONTAMINATION/ DEMOLITION	1	LS									12,331,200			$12,331,200	C	
7	TTA/ RCS (Case B) - D & D	1	LS									10,575,500			$10,575,500	C	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
	SUB-TOTAL - ALL PAY ITEMS	1	LS							9,749,500	16,761,093	54,371,960	8,009,650	13,100,500	$101,992,700		
21	Labor FDF - Operations	3.5	YR								40,620,940				$40,620,940	F	
22	Waste Disposal (PKG & Transport)	6,078	CNT									12,763,800	32,061,450		$44,825,250	F	
22.a	Secondary Waste to OTHER	1	LS									98,415			$98,415	C	
23	Project Management FDF	1	LOT								20,300,800		830,000		$21,130,800	F	
	SUB-TOTAL - FDF SUPPORT ITEMS	1	LS								60,921,740	12,862,215	32,891,450		$106,675,410		
24	Start-up testing	6	Mths									1,154,320			$1,154,320	C	
25	UTILITY	3.5	YR										3,251,030		$3,251,030	C	
26	SPARE PARTS	3.5	YR										1,059,690		$1,059,690	C	
27	Health Physics	3.5	YR								526,100		2,430,400		$2,956,500	C/F	
28	Subcontractor Oversight (ops & Maint)	1	YR									2,208,960			$2,208,960	C	
29	RISK BUDGET 24.0%	1	LS							24,857,010					$24,857,010	C	
	SUB-TOTAL - OPERATION/ MAINT ITEMS	1	LS							24,857,010	526,100	3,363,280	6,741,120		$35,487,510		
	TOTAL CONTRACTOR COSTS OF MONEY											27,567,063			$27,567,063		
	TOTAL CONTRACTOR COSTS - FY99 $'s									34,606,510	78,208,930	98,164,520	47,642,220	13,100,500	$271,722,680		
30	NTS DISPOSAL FEE w/ 15% risk	1	LS							3,161,140		21,074,234			$24,235,370	D	
	TOTAL PROJECT COST	1	LOT							37,767,650	78,208,930	119,238,754	47,642,220	13,100,500	$295,958,050		

C: CONTRACTOR F: FLUOR DANIEL FERNALD G: GCBCTC LABOR D: DOE %: PERCENTAGE of VARIABLE TOTALS T: TIME DEPENDANT V: VOLUME DEPENDANT O: OPERATING EFFIC. APPLIED W: WEIGHT X: FIXED COST

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C.4.2 Capital Cost Estimate Basis: Chemical Stabilization — Cement-based

C.4.2.1 Introduction

The capital cost estimate for the Chemical Stabilization — Cement-based (CHEM1) alternative is summarized in **Table C.4.2-1**.

The capital costs of the CHEM1 alternative were prepared as detailed estimates based on the equipment lists, process and mechanical equipment data sheets, single-line electrical diagrams, architectural sketches, and the plot plan provided in the **Design Basis and Description (Appendix G)** for this alternative.

TABLE C. 4.2-1
CAPITAL COST ESTIMATE FOR CHEMICAL STABILIZATION — CEMENT-BASED

Section	Cost Element	Estimated Cost
C.4.2.2.4.1	Pre-Mobilization	$678,000
C.4.2.2.4.2	DFC	$24,843,043
C.4.2.2.4.3	IFC	$16,295,100
C.4.2.2.4.4	Construction Management	$3,711,500
C.4.2.2.4.5	Risk Budget	$9,749,500
C.4.2.1	Total Capital Cost	$55,277,143

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C.4.2.2 Estimate Basis

The cost estimate basis for the capital cost of the Chemical Stabilization — Cement-based alternative is comprised of the following six sections (**Sections C.4.2.2.1** through **C.4.2.2.6**):

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.4.2.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in the second quarter, 1999 U.S. dollars.
2. Labor costs are based on a 4-day/week, 10-hr/day, 40-hr work week with an adequate supply of skilled labor available in the area.
3. Mission changes or major rework does not occur during the engineering, procurement, and construction phases of the project.
4. Machinery, equipment, and bulk materials are purchased in the U.S.
5. Engineered machinery and equipment pricing is obtained from engineering specialists and includes freight to the jobsite.
6. Bulk material pricing is estimated using in-house material pricing data.
7. A site productivity multiplier of 1.186 is applied to estimated installation mhr.
8. A sales tax of 6% is applied to estimated equipment and material dollars.
9. Freight is estimated at 2.5% of equipment and material dollars.

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C.4.2.2.2 Inclusions

The capital cost estimate includes the costs of the Chemical Stabilization — Cement-based process equipment, utility equipment, and the associated buildings and structures.

C.4.2.2.3 Exclusions

The following elements of cost are excluded from the capital cost estimate:

- Silos 1 and 2 material retrieval;
- Silo 3 material retrieval and remediation;
- Capital, start-up, and operating spare parts;
- Start-up costs;
- Expense funded costs;
- Operating costs; and
- D&D costs.

C.4.2.2.4 Format and Coding

The CHEM1 capital cost estimate is compiled and summarized into the following cost centers:

- Pre-mobilization;
- Direct field;
- Indirect field;
- Construction management;
- Risk budget; and
- Contingency.

The following discussion provides a brief description of the cost centers.

C.4.2.2.4.1 Pre-mobilization Costs

Pre-mobilization costs are the costs for the development and issuance of project documentation and planning.

C.4.2.2.4.2 Direct Field Costs

DFC are the costs for direct construction of the CHEM1 full-scale treatment facility. These costs include craft labor, bulk materials, machinery, and equipment. The FS estimates are further summarized into the following primary, DFC code accounts:

- A/C 0 – Excavation and Civil Works
- A/C 1 – Concrete
- A/C 2 – Structural Steel
- A/C 3 – Architectural
- A/C 4 – Machinery and Equipment
- A/C 5 – Piping
- A/C 6 – Electrical
- A/C 7 – Instrumentation and Control Systems
- A/C 8 – Paint and Insulation
- A/C AA – Mobilization

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The DFCs for the machinery, equipment, and electrical power distribution accounts are broken down into the following systems:

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15 – Feed Preparation
16 – Processor Feed
17 – Processor
18 – Process Off-gas
20 – Radon Control
23 – Product Forming and Handling
25 – Container Receipt and Handling
26 – Product Recycle
30 – High Voltage
31 – 480 V Distribution
32 – Standby Power
33 – UPS
40 – Plant and Instrument Air
41 – Breathing Air
44 – Product Additive
50 – Process Water
51 – Portable Water
52 – Fire Water
53 – Cooling Water
61 – Non-Radioactive Waste
63 – Laboratory Waste
64 – Radioactive Waste
73 – Waste Processing Building HVAC
75 – Analytical Laboratory HVAC
76 – Maintenance and Warehouse Facilities HVAC
77 – Miscellaneous Facilities HVAC
80 – Maintenance Equipment
82 – Remote Handling Equipment
83 – RAD Shielding Equipment
84 – Sampling
85 – CCTV
93 – Health Protection
94 – Analytical Laboratory

C.4.2.2.4.3 Indirect Field Costs

IFC are the costs for the direct construction effort. These costs include:

- Construction supervision;
- Small tools and consumable supplies;
- Construction equipment rental;
- Temporary construction facilities;
- Temporary utilities;
- Job clean-up;
- Safety training;
- Health physics;
- CERCLA;
- GET/Site access & job specific training;
- Payroll burdens and benefits;
- Overhead and profit;
- Bond; and
- Sales tax.

C.4.2.2.4.4 Construction Management Costs

Construction management costs are costs for construction activities that occur at the FEMP. These costs include construction management labor costs for managing and coordinating the construction activities at the FEMP, and the costs for hooking up and supporting construction temporary trailers, supplies, and utilities.

C.4.2.2.4.5 Risk Budget

Allowance for risks and uncertainties associated with the construction of the plant.

C.4.2.2.5 Methodology

The following assumptions, MTO allowances, and methods are used to prepare the capital cost estimate:

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Premobilization

The premobilization costs are activity-based level-of-effort support estimates.

Direct Field Costs

Civil Work

Neat quantities are taken off; a slope of 1.8 to 1 is assumed in all excavation 5'0" below-grade, and a 15% swell factor is used to backfill quantities. Since excavated soils are assumed suitable for backfill, imported backfill material is not included. A disposal site is assumed to be located within one-half mile from the construction site.

Concrete

Neat quantities are taken off and rounded to the nearest ten yards. Fluor standard all-in unit rates per CY are applied to the MTO quantities. The all-in rates include the price of concrete, formwork, reinforcing steel, and embedded accessories. Concrete material pricing is developed from current in-house information.

Structural Steel

Steel quantities are taken off and rounded to the nearest ton. A MTO allowance ranging from 5 to 10 percent is applied:

Light-	Qty + 10%
Medium-	Qty + 7.5%
Heavy-	Qty + 5%
Siding/Decking	Qty + 10%

Steel material pricing is developed from current in-house information.

Architectural

Architectural quantities are developed from the building plan and elevation drawings, and rounded. Unit rates of installation are developed for the various architectural construction tasks. Material pricing is developed from the current in-house information. Various MTO allowances ranging from 1 to 10% are applied to quantities, depending on the type of architectural material.

The estimate contains the following buildings:

Waste Process Building	36,080 SF
Analytical Laboratory	3,024 SF
Warehouse	9,600 SF
Mechanical/Electrical Building	5,100 SF
Control Room	720 SF
Additive Bin Storage Facility	4,912 SF
On-site Storage Building	30,712 SF
PPE Trailer	504 SF

HVAC Ductwork

Ductwork is estimated by lb/ft^2 of building area. All ductwork related items are estimated as a percentage of the ductwork cost:

Description	Installation mhr	Material
duct	lb x .057 mhr/lb	$2.14
dampers	15% duct mhr	15% duct matl$
accessories	7% duct mhr	7% duct matl$
supports	20% duct mhr	20% duct matl$
insulation	17% duct mhr	17% duct matl$
test and balance	25% duct mhr	N/A

HVAC equipment is included in the machinery and equipment A/C estimate.

Machinery and Equipment

The machinery and equipment pricing is developed by Engineering from informal vendor quotes and in-house pricing. The pricing includes freight to the jobsite. The equipment installation rates are developed from in-house data, or crew size, duration estimates. The installation mhrs include the setting and testing of the equipment. Routine maintenance is included in the installation rates on an annual basis.

Piping

The piping estimate is developed using two methods, MTO, and factoring.

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Take-off allowances are made for the following systems:

- Contaminated water (double encased line from the sumps to its tank).
- Potentially contaminated water (line from the sumps to its tank).
- Fire water loop, hydrants, and branches to the buildings.
- New stormwater system line involving the relocation of an existing line, and the installation of new HDPE.
- Feed lines to the additive storage bins.

Allowances for pipe valves are developed as follows:

- Pumps are assigned 3 ea. – ½" gate (drain) valves.
- Tanks are assigned 2 ea. – 2", 2 ea. - ¾" and 1 ea. – ½" gate (gauge & drain) valve.

Piping costs were factored for the remaining process and utility systems, based on the equipment costs. The factors are based on prior estimates of similar waste processing facilities.

Electrical

The electrical estimate is developed using both a MTO approach and factoring.

MTOs for power distribution are prepared by the process/utility system, based on the power load requirements shown in the equipment list and one-line diagrams. A factored approached is taken to develop the remaining electrical bulk wiring for the non-process instruments connect to the DCS, and additional melter wiring requirements. The factors are based on similar waste processing facility estimates. Building lighting and communications estimates are derived on a cost per square feet basis. Area lighting for the plot and building grounding is taken off based on the current plot plans.

Instrumentation

The instrumentation estimate is developed using a combination of take-off and factoring methods. Engineering provides a priced process system instrument list. Conceptual process diagrams are used as a basis to take off the local instrumentation. An allowance for isokinetic monitoring is added for the off-gas and the HVAC stacks. Leak detection is added for the double encased contaminated water lines. An allowance for HVAC controls is added based on the HVAC equipment list. The remaining instrument for the utility systems is factored in lieu of instrument diagrams. The factors are developed based on similar waste processing facility estimates.

Paint

The painting estimate is derived using take-off, allowances, and factoring methods. A MTO approach is used to calculate paint requirements for architectural drywall, doors, concrete floors, wall and ceilings, and tanks and stacks. Paint for pricing is factored with the pipe from the equipment account.

Insulation

The insulation estimate is developed using a take-off approach for architectural insulation, and a factored approach for piping and HVAC duct work requirements.

Indirect Field Costs

Construction Supervision

This element of cost includes the following contractor support staff:

- General Superintendent,
- Superintendent,
- Assistant Superintendent,
- Office Administrator,
- Labor Relations,
- Job Coordinator,
- Safety Engineer,
- Field Office and Material Manager,
- Time and Material Supervisor,
- Chief Timekeeper,
- Field Project Accountant,
- Cost Estimator,
- Civil Engineer,
- Construction Warehouseman,
- Time Keeper,
- Material Man, and
- Construction Accounting Clerk.

Construction supervision is estimated at 17% of direct field labor dollars.

Small Tools and Consumables

The cost of small tools and consumables is estimated at 6% of direct field labor dollars and provides for items valued at $500 or less.

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Equipment Rental

This cost includes smaller light construction equipment used during the construction phase of the project. This cost excludes large cranes, which are specifically defined on the construction estimate. Equipment rental is estimated at $3.50 per direct field labor mhrs.

Temporary Facilities

This cost includes temporary buildings/sheds/trailers and warehouses used during the course of construction. It is estimated at 6% of direct field labor dollars (split 50% to indirect labor, 50% to indirect material).

Job Clean-up

Includes housekeeping of site/work areas to maintain a safe, clean work environment. Clean up is estimated at 6% of direct field labor dollars (split 75% to indirect labor, 25% to indirect material).

Safety

This cost includes expenses for contractor joist safety meetings and supplies. Safety is estimated at 3% of direct field labor dollars (split 65% to indirect field labor, and 35% to indirect field material).

Health Physics

This element of cost includes RAD checks, workers' physicals, participation in drug screening, and material costs associated with PPE. Health physicals are estimated on a cost per FTE manpower basis.

CERCLA/SAT

This cost includes site access and RAD training. It is estimated on a cost per FTE basis.

Payroll Burdens and Benefits

This cost includes FICA payments, FUI, SUI, union benefits, and disability. Payroll burdens and benefits are calculated at 57% of the sum of direct and indirect field (labor dollars).

Overhead and Profit

This cost includes the contractor's overhead and profit. It is estimated at 20% of direct and IFC.

Bond

This is the contractor's cost to bond the project; it is estimated at 1% of total direct and IFC.

Sales Tax

This cost is calculated at 6% of the total material cost (direct and indirect).

Engineering

This cost is calculated as an estimated FTE by discipline, engineering phase, and schedule. The estimate is priced at an all-in rate to include labor, overheads and expenses.

Construction Management

This cost is calculated at 30% of the direct and indirect labor cost.

Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the construction of the plant. Cost risk analysis for capital cost is 14.2%, which is based on the capital risk analysis for the AWR and Silo 3 projects.

Contingency

Contingency cost is a DOE allowance for project uncertainties and is calculated at 8% of the capital estimate.

C.4.2.2.6 References

Basis of Design and Description (Appendix G).

C.4.2.2.7 Attachment

The capital cost estimate summary for the CHEM1 alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.4.2.I

Capital Cost Estimate Summary for

Chemical Stabilization — Cement-based

CONTROL ES. ATE SUMMARY

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	PRE-MOBILIZATION -CONTRACTOR	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
1	PRE-MOBILIZATION																
	DOCUMENTATION																
	(Fm. Pre-mob to thru De-mob.) (100% Paymnt. upon receipt)																
	FDF AUTHORIZATION to MOBILIZE																
	HEALTH & SAFETY PROGRAM																
	- Accident Prevention Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	- Respirator Program	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	- Heat & Cold Stress Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Substance Abuse Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Fall Protection Plan	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- MSDS Documentation	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	LABOR RELATIONS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WORK FORCE UTILIZATION PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SAFETY ASSESSMENT (CONST.)	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	TURNOVER PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SYSTEM OPERABILITY TEST REPORT	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WASTE MANEGMENT PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	HAZOP's REVIEW & REPORT	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	CONSTRUCTION ACCEPTANCE TESTS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	TRAINING OF PERSONNEL (Prior to Site Acce	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFETY BASIS ASSESSMENT -																
	- Documentation - 6 mo.	1	LS	1040.0	1,040	$75.00					$78,000				$78,000	C	
	- Calculation - 12 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	- PHA - 2 x 6 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	FDF AUTHORIZATION to OPERATE																
	OPERATIONS PROCEDURES	1	LS	1200.0	1,200	$75.00					$90,000				$90,000	C	
	INSPECTIONS & PERIODIC MAINTENANCE P	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	OPERATIONS SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	STANDING ORDERS MANUAL	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	LESSONS PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	
	OPERATOR TRAINING PROGRAM PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000		
	OPERATIONS & MAINTENANCE PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	

000425

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CONTROL ESTIMATE SUMMARY

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	PRE-MOBILIZATION -CONTRACTOR	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
1																	
	CONTRACTORS SUBMITTALS																
	Project Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Engineering Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Configuration Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Records Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	System Eng. Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Independ. saftey Review Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Procurement Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Contingency Plan & Emerg. Response	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Environmental Control Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Sampling Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Quality Assurance Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Schedules	1	LS	1060.0	1,060	$75.00					$79,500				$79,500	C	
	TOTAL COST ITEM NO. 1	1	LOT								$678,000				$678,000		

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ESTIMATE SUMMARY SHEET

PROJECT:	Silos 1 & 2 Cement Stabilization(FS)	FLUOR DANIEL FERNALD	8113	DATE:	05-Nov-99
ESTIMATE NO.:	C4981005			ESTIMATOR:	J. ELLIS
''IENT:	DOE			LOCATION:	FERNALD
; NO.:	2.1.3.G.P			TASK NO.:	4S11B

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO. 2	AAA - Mobilization	800		$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities	9,203		$201,593		$103,050	$9,800	$314,443
	100 - Concrete All Facilities	95,781		$2,032,500		$1,296,800		$3,329,300
	200 - Structural Steel - All Facilities	16,321		$370,200		$963,200		$1,333,400
	300 - Architectural/Buildings/Finishes-All Fac	34,458		$737,700		$1,391,000		$2,128,700
	400 - Equipment Systems 1 - 94	22,590		$555,700			$10,756,300	$11,312,000
	500 - Piping	15,039		$369,800		$400,700		$770,500
	600 - Instrumentation	5,929		$125,200		$1,431,800		$1,557,000
	700 - Electrical	59,410		$1,252,100		$1,109,700	$645,800	$3,007,600
	800 - Paint / Insulation	11,071		$245,500		$115,000		$360,500
DIRECT FIELD COSTS TOTAL		270,602	$21.99	$5,950,293	$669,600	$6,811,250	$11,411,900	$24,843,043
SUPERVISION - CONTRACTOR		46,000		$1,011,500				$1,011,500
SMALL TOOLS & CONSUMABLES						$357,000		$357,000
MISC. EQUIP. RENTAL							$947,100	$947,100
TEMPORARY FACILITIES		8,118		$178,500		$178,500		$357,000
TEMPORARY UTILITY HOOK-UP		5,277		$116,000		$62,500		$178,500
JOB CLEAN-UP		12,177		$267,800		$89,300		$357,100
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)								
.TH PHYSICS S/C		9,905		$217,800		$57,700		$275,500
..CLA - 40 HRs/FTE		3,650		$80,300				$80,300
GET/SITE ACCESS & JOB SPECIFIC TRAINING		2,628		$57,800				$57,800
PAYROLL BURDENS & BENEFITS		-	-	$4,491,600				$4,491,600
OVERHEAD & PROFIT		-	-		$6,591,300			$6,591,300
BOND		-	-		$395,500			$395,500
SALES TAX		-	-			$453,400	$741,500	$1,194,900
INDIRECT FIELD COSTS TOTAL		87,755		$6,421,300	$6,986,800	$1,198,400	$1,688,600	$16,295,100
DIRECT & INDIRECT FIELD COSTS TOTAL- ITEM NO. 2		358,357	$34.52	$12,371,593	$7,656,400	$8,009,650	$13,100,500	$41,138,143
WASTE DISPOSITION MGMT. - FD FERNALD								
OFF-SITE DISPOSAL COSTS (Commercial)								
WASTE MANAGEMENT COSTS TOTAL								
PROJECT MANAGEMENT - FD FERNALD								
CONSTRUCTION MANAGEMENT - FD FERNALD				$3,711,500				$3,711,500
FD FERNALD FIELD SUPPORT COSTS TOTAL- ITEM NO.3				$3,711,500				$3,711,500
ENGINEERING/DESIGN/INSPECTION - FD FERNALD								
ENGINEERING/DESIGN/INSPECTION - A/E					$23,808,860			$23,808,860
ENGINEERING COSTS TOTAL - ITEM NO.4					$23,808,860			$23,808,860
SALES TAX - FD FERNALD								
SUB-TOTAL (BASE ESTIMATE)								$68,658,500
RISK BUDGET	14.2%	ITEM NO. 5						$9,749,500
TARGET ESTIMATE		(FY 99 DOLLARS)						$78,408,000
'ITINGENCY	8.0%							$5,492,700
, BURIAL FEE								

ESTIMATE PERFORMED BY ESTIMATING SERVICES

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY CAPITAL NO. 2	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	AAA - Mobilization				800						$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities				9,203						$201,593		$103,050	$9,800	$314,443
	100 - Concrete All Facilities				95,781						$2,032,500		$1,296,800		$3,329,300
	200 - Structural Steel - All Facilities				16,321						$370,200		$963,200		$1,333,400
	300 - Architectural/Buildings/Finishes-All Fac				34,458						$737,700		$1,391,000		$2,128,700
	400 - Equipment Systems 1 - 94	Rev 10/25/99			22,590						$555,700			$10,756,300	$11,312,000
	500 - Piping				15,039						$369,800		$400,700		$770,500
	600 - Instrumentation				5,929						$125,200		$1,431,800		$1,557,000
	700 - Electrical	Rev 10/25/99			59,410						$1,252,100		$1,109,700	$645,800	$3,007,600
	800 - Paint / Insulation				11,071						$245,500		$115,000		$360,500
	Note: The Process, Utility and Electrical Equipment Estimates are based on the Equipment List dated 09-21-99.														
	Subtotal Direct Cost	1	LOT		270,602	$21.99					$5,950,293	$669,600	$6,811,250	$11,411,900	$24,843,043

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DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Civil & Excavation All Facilities														
	D. Excavation of all buildings														
D	1. Excavation	17555	CY	0.11	2289	20.27					$46,400				$46,400
D	2. Backfill and compaction	13950	CY	0.15	2481	20.27					$50,290				$50,290
D	3. Vapor barrier	92915	SF	0.01	881	20.27					$17,860				$17,860
D	4. Haul and dump	6176	CY	0.08	586	20.27					$11,880				$11,880
D	5. Install cage fence	208	LF	0.25	62	20.27			19.33		$1,260		$4,120		$5,380
D	6. Install cage gate	4	EA	4.00	19	20.27			100.00		$390		$410		$800
D	7. Catch basin	4	EA	48.00	228	20.27			650		$4,620		$2,670		$7,290
D	8. C B frame and cover	4	EA	5.00	24	20.27			210		$490		$860		$1,350
D	9. Sand bedding	335	CY	0.75	298	20.27			12		$6,040		$4,120		$10,160
D	Concrete filled pipe posts	42	EA	0.75	37	20.27			66		$750		$2,840		$3,590
	E. SITE WORK														
D	1. Grade,scarify & compact site	19584	SY	0.029	673	20.27					$13,640				$13,640
D	2. Rough gtrade & compact for roads	2987	SY	0.038	135	20.27					$2,740				$2,740
D	3. Spread & compact crushed rock for roads	2987	SY	0.017	60	20.27			2.4		$1,220		$7,350		$8,570
D	4. Asphalt for roads	2340	SY	0.025	69	20.27			8.16		$1,400		$19,570		$20,970
D	5. Repair shoulder of roads	647	SY	0.020	15	20.27					$300				$300
D	6. Final site grading	7064	SY	0.012	101	20.27					$2,050				$2,050
D	7. Crushed rock for site	7064	SY	0.017	142	20.27			2.4		$2,880		$17,380		$20,260
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		8,100	$20.27					164,200		59,300		$223,500

000430

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	A. RECEIVING & LAYDOWN AREAS														
	1. for EQUIPMENT - 150' x 150' x 1'														
	i. Subgrade Pavement Base	2,500	SY	0.016	47	20.27	0.38			0.68	$950			$1,690	$2,640
	ii. Base Course, 12" deep	2,500	SY	0.017	50	20.27	0.40		8.05	0.52	$1,010		$20,130	$1,310	$22,450
	iii. Stabilization Fabric, 6 oz.	2,500	SY	0.030	89	20.27	0.72		2.45	0.12	$1,800		$6,130	$300	$8,230
	iv. Penetration crushed stone, 4" thk	2,500	SY	0.020	59	20.27	0.48		1.46	0.02	$1,200		$3,650	$50	$4,900
	2. extension of utilities														
	i. Tie-in water supply	1	LS	80.00	95	20.27	1930.00		500.00	2180.00	$1,930		$500	$2,180	$4,610
	ii. Tie-in electrical system	1	LS	80.00	95	20.27	1930.00		500.00	1500.00	$1,930		$500	$1,500	$3,930
	iii. Subgrade pavement base	225	SY	0.016	4	20.27	0.36		2.45	0.12	$80		$550	$30	$660
	iv. Base Course 12" deep	225	SY	0.017	5	20.27	0.44		1.46	0.02	$100		$330		$430
	B. RELOCATE EXISTING ITEMS														
	i. Subgrade Pavement Base	1,000	SY	0.016	19	20.27	0.39			0.68	$390			$680	$1,070
	ii. Base Course, 12" deep	1,000	SY	0.017	20	20.27	0.41		8.05	0.52	$410		$8,050	$520	$8,980
	iii. Stabilization Fabric, 6 oz.	1,000	SY	0.003	4	20.27	0.08		2.45	0.12	$80		$2,450	$120	$2,650
	iv. Penetration crushed stone, 4" thk	1,000	SY	0.002	2	20.27	0.04		1.46	0.02	$40		$1,460	$20	$1,520
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	C. STORMWATER MANAGEMENT														
	1. WASTE PREP BLDG.														
mD	i. Excav. footings,Piers,gradebeams	234	BCY	0.34	80	28.68	9.80			1.28	$2,294			$300	$2,594
mD	ii. Backfill footings,Piers,gradebeams	409	ICY	0.22	90	26.76	5.89			0.98	$2,409			$400	$2,809
	iii. Haul excess to stockpile	156	LCY	0.48	75	22.94	11.03			1.92	$1,721			$300	$2,021
mD	iv. Excav. Interior Wall footings	120	BCY	0.33	40	23.75	7.92			0.83	$950			$100	$1,050
mD	v. Backfill Interior Wall Footings	87	ICY	0.37	32	25.00	9.20			1.15	$800			$100	$900
	vi. Haul excess to stockpile	50	LCY	1.14	57	22.81	26.00			4.00	$1,300			$200	$1,500
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		1,103	$33.90					37,393		43,750	9,800	$90,943

000431

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	100 - Concrete-All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	CONCRETE														
D	1. Install slab on grade	2801	CY	3.70	12287	21.22			85.40		$260,730		$245,190		$505,920
D	2. Install walls	2158	CY	12.20	31214	21.22			176.00		$662,360		$389,300		$1,051,660
D	3. Install structural footings	610	CY	6.70	4846	21.22			109.70		$102,830		$68,590		$171,420
D	4. Install continuous footings	620	CY	5.10	3749	21.22			113.40		$79,550		$72,070		$151,620
D	5. Install equipment foundations	270	CY	8.20	2625	21.22			105.60		$55,700		$29,220		$84,920
D	6. Grouting	330	CF	1.00	391	21.22			3.25		$8,300		$1,100		$9,400
D	7. Tilt-up walls	39753	SF	0.24	11311	21.22			3.61		$240,020		$147,100		$387,120
D	8. Install elevated slab	1128	CY	12.50	16717	21.22			181.50		$354,730		$209,850		$564,580
D	9. Install columns for modular walls	515	CY	18.70	11418	21.22			224.80		$242,290		$118,670		$360,960
D	10. Install stack base	2	CY	8.20	19	21.22			105.60		$400		$220		$620
D	11. Install duct footings	6	CY	8.20	58	21.22			105.60		$1,230		$650		$1,880
D	12. Install guy anchors	8	CY	8.20	78	21.22			105.60		$1,660		$870		$2,530
D	13. Fabricate cover block	12	EA	54	764	21.22			1026		$16,210		$12,620		$28,830
D	14. Erect cover block	12	EA	11	161	21.22					$3,420				$3,420
D	15. Stack structural footing	4	CY	6.70	32	21.22			109.70		$680		$450		$1,130
D	16. Embedded bolts sor box beam	144	EA	0.650	111	21.22			5.85		$2,360		$860		$3,220
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		95,781	$21.22					2,032,500		1,296,800		$3,329,300

000432

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	200 - Structural Steel - All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	Structural Steel														
D	1. Install metal roofing	31865	SF	0.008	302	22.68			0.72		$6,850		$23,520		$30,370
D	2. Install light steel	192	TON	25.00	5691	22.68			1750.00		$129,070		$344,400		$473,470
D	3. Install medium steel	106	TON	22.00	2765	22.68			1510.00		$62,710		$164,060		$226,770
D	4. Install heavy steel	121	TON	19.00	2732	22.68			1340.00		$61,960		$166,610		$228,570
D	5. Install stack structure	4.4	TON	22	117	22.68			1533		$2,650		$6,940		$9,590
D	6. Install checkered plate	4215	SF	0.11	550	22.68			5.92		$12,470		$25,580		$38,050
D	7. Install ladders	393	LF	0.64	298	22.68			56.50		$6,760		$22,760		$29,520
D	8. Install stairs	309	RISER	2.31	846	22.68			87.50		$19,190		$27,710		$46,900
D	9. Install handrails	685	LF	0.13	102	22.68			13.45		$2,310		$9,440		$11,750
D	10. Install pre-engineered structure	10800	SF	0.05	640	22.68			5.18		$14,520		$57,340		$71,860
D	11 Crane rails	3.82	TON	12.00	54	22.68			880.00		$1,220		$3,450		$4,670
D	12. Install crane rail box beam	11	TON	17.30	230	22.68			1657.00		$5,220		$19,020		$24,240
D	13. Install support for box beam	26	EA	15.00	462	22.68			700.00		$10,480		$18,660		$29,140
D	14. Install crane rail stops	4	PR	4.00	19	22.68			450.00		$430		$1,850		$2,280
D	15. Install 2-1/2" x 2-1/2" x 1/4" angle iron	182	LF	0.34	73	22.68			3.64		$1,660		$680		$2,340
D	16. Install sumps	24	EA	26.00	740	22.68			1590.00		$16,780		$39,110		$55,890
D	17. Install grading	2093	SF	0.15	372	22.68			8.40		$8,440		$18,020		$26,460
D	19. Install davit	1	EA	5.00	6	22.68			700.00		$140		$720		$860
D	20. Install kickplate	305	LF	0.05	18	22.68			3.60		$410		$1,130		$1,540
D	21. Install duct support	6	EA	10.00	71	22.68			656.00		$1,610		$4,030		$5,640
D	22. Install duct to stack	150	LF	1.11	197	22.68			41.64		$4,470		$6,400		$10,870
D	. Guy cable	800	LF	0.04	36	22.68			2.16		$820		$1,770		$2,590
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		16,321	$22.68					$370,200		$963,200		$1,333,400

8113

004433

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	300 - Architectural/Buildings/Finishes-All Fac	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
.2															
	ARCHITECTURAL														
D	1. Install metal stud w/gyp. board	12285	SF	0.051	743	21.41			1.02		$15,910		$12,840		$28,750
D	2. Install vents and drains	56852	SF	0.005	337	21.41			0.35		$7,220		$20,400		$27,620
D	3. Install cleaning agent	1	LOT	25.0	30	21.41			10700		$640		$10,970		$11,610
D	4. Install siding	86925	SF	0.041	4225	21.41			0.86		$90,460		$76,620		$167,080
D	5. Install roof insulation	31865	SF	0.007	264	21.41			0.44		$5,650		$14,370		$20,020
D	6. Install wall insulation	43465	SF	0.005	258	21.41			0.35		$5,520		$15,590		$21,110
D	7. Install membrane roofing	31865	SF	0.025	944	21.41			1.31		$20,210		$42,790		$63,000
D	8. Install 1/2" fiber board	31865	SF	0.009	340	21.41			0.20		$7,280		$6,530		$13,810
D	9. Install single exterior door 3x7	26	EA	8.00	247	21.41			680.00		$5,290		$18,120		$23,410
D	10. Install double ext. door 6x7	7	EA	14.00	116	21.41			970.00		$2,480		$6,960		$9,440
D	11. Install roll-up door 14' x 14'	8	EA	15.00	142	21.41			14000		$3,040		$114,800		$117,840
D	12. Install single int. door 3x7	33	EA	6.00	235	21.41			280.00		$5,030		$9,470		$14,500
D	13. Install double int. door 6x7	10	EA	12.00	142	21.41			510.00		$3,040		$5,230		$8,270
D	14. Install roof closure	470	LF	0.14	78	21.41			13.15		$1,670		$6,340		$8,010
D	15. Install bldg. communications	97512	SF	0.03	3468	21.41			0.53		$74,250		$52,970		$127,220
D	16. Install coated poly. bldg. cover	41512	SF	0.104	5116	21.41			9.07		$109,530		$385,940		$495,470
D	17. Install tank shelter	1	EA	340.0	403	21.41			14100		$8,630		$14,450		$23,080
D	18. Block and level trailers	9	EA	50.0	534	21.41			13889		$11,430		$128,130		$139,560
D	19. Install skirting around trailers	1356	SF	0.1	111	21.41			1.04		$2,380		$1,450		$3,830
D	20 Seal ext. walls,roof & floor	617	LF	0.3	183	21.41			3.50		$3,920		$2,210		$6,130
D	21 Fab abd install stairs & ramps	1	LOT	120	142	21.41			1574		$3,040		$1,610		$4,650
D	22 Ceiling	100	SF	0.027	3	21.41			0.80		$60		$80		$140
D	1. install building sprinklers	92230	SF	0.056	6070	21.41			1.61		$129,960		$152,550		$282,510
D	1.Install double int. door 10x8	3	EA	22.00	78	21.41			975		$1,670		$3,000		$4,670
	C.H.V.A.C.														
D	1. install ductwork galv. stl.	82713	LBS	0.06	5590	21.41			2.14		$119,680		$181,430		$301,110
D	2. install dampers	1	LOT	703	833	21.41			26367		$17,830		$27,030		$44,860
D	3. install accessories	1	LOT	329	390	21.41			12389		$8,350		$12,700		$21,050
D	4. install supports	1	LOT	936	1110	21.41			35094		$23,770		$35,970		$59,740
D	5. install insulation	1	LOT	791	938	21.41			29661		$20,080		$30,400		$50,480
D	6. Test and Balance	1	LOT	1171	1388	21.41					$29,720				$29,720
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		34,458	$21.41					737,700		1,391,000		$2,128,700

004434

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 1 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
·2	**Equip. No.15 Description**														
D	15-ag-001Receiving Tank Agitator	1	EA	85.0	101	24.59				35400	$2,480			$36,290	$38,770
D	15-ag-002 Clarifier Rake	1	EA	80.0	95	24.59				W/15-tk-0	$2,340				$2,340
D	15-ag-003,04,05 Slurry batch tank agitator	3	EA	60.0	213	24.59				22500	$5,240			$69,190	$74,430
D	15-ag-008 Supernatant tank agitator	1	EA	20.0	24	24.59				8000	$590			$8,200	$8,790
D	15-pm-001 Rec. tank trans pump A & B	2	EA	25.0	59	24.59				15000	$1,450			$30,750	$32,200
D	15-pm-002 Clrifr Undrfow Trans pump A &	2	EA	25.0	59	24.59				7500	$1,450			$15,380	$16,830
D	15-pm-003 Slurry batch trans pump A & B	2	EA	30.0	71	24.59				25000	$1,750			$51,250	$53,000
D	15-pm-004,05 Slurry batch trans pump A &	4	EA	30.0	142	24.59				25000	$3,490			$102,500	$105,990
D	15-pm-008 Supt.sump tnk agitator A & B	2	EA	25.0	59	24.59				2600	$1,450			$5,330	$6,780
D	15-tk-001 Waste Slurry Receiving Tank	1	EA	320.0	379	24.59				70000	$9,320			$71,750	$81,070
D	15-tk-002 Clarifier	1	EA	140.0	166	24.59				54000	$4,080			$55,350	$59,430
D	15-tk-003,04,05 Slurry batch tank	3	EA	125.0	445	24.59				24000	$10,940			$73,800	$84,740
D	15-tk-006 Filt Cake weight & Deliv Hopper	1	EA	40.0	47	24.59				60000	$1,160			$61,500	$62,660
D	15-tk-008 Supernatent sump tank	1	EA	50.0	59	24.59				10000	$1,450			$10,250	$11,700
D	15-fl-001 Auto. filter press	1	EA	400.0	474	24.59				400000	$11,660			$410,000	$421,660
	Equip. No.17 Description														
D	17-ag-001 Mixer Flush Tank Agitator	1	EA	20.0	24	24.59				2000	$590			$2,050	$2,640
D	17-mx-001 Batch mixer	1	EA	250.0	296	24.59				280000	$7,280			$287,000	$294,280
D	17-pm-001 Mixer flush trans. pump	1	EA	25.0	30	24.59				7000	$740			$7,180	$7,920
D	17-tk-001 Mixer flush tank	1	EA	40.0	47	24.59				3000	$1,160			$3,080	$4,240
	Equip. No.25 Description														
D	25-cy-001/002 Motorized Roller Conveyor	2	EA	45.0	107	24.59				40000	$2,630			$82,000	$84,630
D	25-cy-003 Motorized Roller Conveyor	1	EA	55.0	65	24.59				43000	$1,600			$44,080	$45,680
D	25-cy-004 Fill station conveyor	1	EA	240.0	285	24.59				250000	$7,010			$256,250	$263,260
D	25-cy-005/006 Motorized Roller Conveyor	2	EA	55.0	130	24.59				43000	$3,200			$88,150	$91,350
D	25-cy-007 Fill station conveyor	1	EA	110.0	130	24.59				75000	$3,200			$76,880	$80,080
D	25-cy-008 Motorized Roller Conveyor	1	EA	85.0	101	24.59				48000	$2,480			$49,200	$51,680
D	25-cy-009/010 Motorized Roller Conveyor	2	EA	65.0	154	24.59				45000	$3,790			$92,250	$96,040
D	25-cy-011 Motorized Roller Conveyor	1	EA	55.0	65	24.59				42000	$1,600			$43,050	$44,650
D	25-cy-012 Motorized Roller Conveyor	1	EA	155.0	184	24.59				80000	$4,520			$82,000	$86,520
D	25-cy-013 Motorized Roller Conveyor	1	EA	45.0	53	24.59				40000	$1,300			$41,000	$42,300
D	25-cy-014 Motorized Roller Conveyor	1	EA	65.0	77	24.59				45000	$1,890			$46,130	$48,020
D	25-cy-015/016 Motorized Roller Conveyor	2	EA	45.0	107	24.59				40000	$2,630			$82,000	$84,630

000435

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 · Equipment Systems 1 · 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
· 2	25-cy-017 Motorized Roller Conveyor	1	EA	65.0	142	24.59				45000	$3,490			$46,130	$49,620
D	25-cy-018 Motorized Roller Conveyor	1	EA	330.0	391	24.59				260000	$9,610			$266,500	$276,110
D	25-hd-002 Empty cont. handling forklift	1	EA	20.0	24	24.59				40000	$590			$41,000	$41,590
	Equip. No.26 Description														
D	26-bn-001 Rubble Collection Hopper	1	EA	100.0	119	24.59				30000	$2,930			$30,750	$33,680
D	26-bn-002 Rework batch bin	1	EA	120.0	142	24.59				20000	$3,490			$20,500	$23,990
D	26-cn-001 Rewrk bridge crane & Robot Arm	1	EA	240.0	285	24.59				400000	$7,010			$410,000	$417,010
D	26-cy-001 Motorized Rework conveyor	1	EA	120.0	142	24.59				75000	$3,490			$76,880	$80,370
D	26-cy-002 Rubble Transfer Conveyor	1	EA	250.0	296	24.59				35000	$7,280			$35,880	$43,160
D	26-fl-001 Rework Facility vacuum	1	EA	120.0	142	24.59				75000	$3,490			$76,880	$80,370
D	26-gb-001 Rework Glove/Pass thru Station	1	EA	150.0	178	24.59				30000	$4,380			$30,750	$35,130
D	26-me-004 Remote contrl jack hammer	1	EA	100.0	119	24.59				100000	$2,930			$102,500	$105,430
D	26-me-007 Rubble jaw crusher	1	EA	375.0	445	24.59				85000	$10,940			$87,130	$98,070
	Equip. No.40 Description														
D	40-cm-001 Plant Air Compressor	1	EA	100.0	119	24.59				19500	$2,930			$19,990	$22,920
D	40-cm-002 Instrument Air Compressor	1	EA	40.0	47	24.59				5000	$1,160			$5,130	$6,290
D	40-rn-001 Plant Air Compressor Dryer	1	EA	25.0	30	24.59				7500	$740			$7,690	$8,430
D	40-rn-002 Instrument Air Compressor Drye	1	EA	20.0	24	24.59				2100	$590			$2,150	$2,740
D	40-ve-001 Plant Air Receiver	1	EA	40.0	47	24.59				3400	$1,160			$3,490	$4,650
D	40-ve-002 Instrument Air Receiver	1	EA	25.0	30	24.59				1500	$740			$1,540	$2,280
D	40-ve-003 Plant Air Receiver	1	EA	40.0	47	24.59				3400	$1,160			$3,490	$4,650
	Equip. No.41 Description														
D	41-cm-001 Breathing air sys. A & B	2	EA	40.0	95	24.59				106000	$2,340			$217,300	$219,640
	Equip. No.43 Description														
D	43-ag-001 Lime Addition Tank Agitator	1	EA	20.0	24	24.59				4600	$590			$4,720	$5,310
D	43-ag-002 Ferr Sulfate Addn Slurry Tk Ag	1	EA	20.0	24	24.59				4600	$590			$4,720	$5,310
D	43-bl-001 Lime addit. vacuum blower	1	EA	55.0	65	24.59					$1,600			incl w/43-bn-00	$1,600
D	43-bn-001 Lime addit. bag station	1	EA	20.0	24	24.59				14000	$590			$14,350	$14,940
D	43-bn-002 Lime addit. filter receiver	1	EA	20.0	24	24.59				17000	$590			$17,430	$18,020
D	43-pm-001 Lime addit. trans. pump	1	EA	25.0	30	24.59				7000	$740			$7,180	$7,920
D	43-pm-002 Ferr Sulf Addition Transf Pump	1	EA	25.0	30	24.59				10000	$740			$10,250	$10,990
D	43-tk-001 Lime addit. slurry tank	1	EA	25.0	30	24.59				1500	$740			$1,540	$2,280
D	43-tk-002 Ferr Sulf Addn Slurry Tk	1	EA	25.0	30	24.59				1500	$740			$1,540	$2,280
D	43-pm-003 Ferr Sulf Addition Transf Pump	1	EA	25.0	30	24.59				1500	$740			$1,540	$2,280

000436

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 1 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	**Equip. No.44 Description**														
D	44-bn-001 Cement storage bin	1	EA	160.0	190	24.59				52000	$4,670			$53,300	$57,970
D	44-bn-002 & 003 Additive storage bin	2	EA	100.0	237	24.59				42000	$5,830			$86,100	$91,930
D	44-bn-004 Additive storage bin	1	EA	160.0	190	24.59				52000	$4,670			$53,300	$57,970
D	44-bn-005 Additive wt and Deliv Hopper	1	EA	60.0	71	24.59				30000	$1,750			$30,750	$32,500
D	44-bn-006 Cement mix del. hopper	1	EA	60.0	71	24.59				30000	$1,750			$30,750	$32,500
D	44-cy-001,002,003,004 Air slides	4	EA	40.0	190	24.59				7500	$4,670			$30,750	$35,420
D	44-pm-001 Cement Mixer trans. pump	1	EA	80.0	95	24.59				36000	$2,340			$36,900	$39,240
	Equip. No.56 Description														
D	56-pm-001 Recyl. water line pump	1	EA	30.0	36	24.59				3100	$890			$3,180	$4,070
	Equip. No.57 Description														
D	57-ws-001 Wash	1	EA	200.0	237	24.59				180000	$5,830			$184,500	$190,330
	Equip. No.61 Description														
D	61-pm-001..010 Potent. rad waste sump pu	10	EA	40.0	474	24.59				6000	$11,660			$61,500	$73,160
D	61-tk-001 Pot rad wtr. coll. tank	1	EA	220.0	261	24.59				59000	$6,420			$60,480	$66,900
	Equip. No.62 Description														
D	62-ag-004/005 Effluent Tank Agitator	2	EA	25.0	59	24.59				15000	$1,450			$30,750	$32,200
D	62-fl-001A/B Waste Water Tank Filter	2	EA	30.0	71	24.59				7200	$1,750			$14,760	$16,510
D	62-pm-001A/B Filtrate Tank Transfer Pump	2	EA	30.0	71	24.59				5000	$1,750			$10,250	$12,000
D	62-pm-002A/B Oxidation Tank Transf Pump	2	EA	30.0	71	24.59				5000	$1,750			$10,250	$12,000
D	62-pm-003A/B Waste Wtr Tank Transf Pmp	2	EA	30.0	71	24.59				5000	$1,750			$10,250	$12,000
D	62-pm-004A/B Effluent Tank Transf Pmp	2	EA	25.0	59	24.59				3000	$1,450			$6,150	$7,600
D	62-pm-005A/B Effluent Tank Transf Pmp	2	EA	25.0	59	24.59				3000	$1,450			$6,150	$7,600
D	62-pm-006/007 Metering Pump	2	EA	10.0	24	24.59				2400	$590			$4,920	$5,510
D	62-pm-008Filter Press Rm Sump Disch Pm	1	EA	25.0	30	24.59				6000	$740			$6,150	$6,890
D	62-pm-009/010/011 Metering Pump	3	EA	10.0	36	24.59				2400	$890			$7,380	$8,270
D	62-tk-001 Filter Press Filtrate Tank	1	EA	180.0	213	24.59				27000	$5,240			$27,680	$32,920
D	62-tk-002 Oxidation Tank	1	EA	60.0	71	24.59				11000	$1,750			$11,280	$13,030
D	62-tk-003 Waste water Treatment Tank	1	EA	60.0	71	24.59				11000	$1,750			$11,280	$13,030
D	62-tk-004/005 Effluent Tank	2	EA	85.0	202	24.59				15000	$4,970			$30,750	$35,720
	Equip. No.63 Description														
D	63-tk-001, 002 Lab waste tank	2	EA	10.0	24	24.59				300	$590			$620	$1,210
	Equip. No.64 Description														
D	64-pm-001..014 Rad waste sump pump	14	EA	40.0	664	24.59				6000	$16,330			$86,100	$102,430

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8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 1 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
D	64-tk-001 Rad wtr. coll. tank	1	EA	380.0	451	24.59				107000	$11,090			$109,680	$120,770
	Equip. No.73 Description														
D	73-ah-001 Cont. proc. area air handler unit	1	EA	120.0	142	24.59				36300	$3,490			$37,210	$40,700
D	73-ah-002A/B Curing Room air handler un	2	EA	120.0	285	24.59				40600	$7,010			$83,230	$90,240
D	73-ah-003 Stabilz. fac. air handler unit	2	EA	80.0	190	24.59				28400	$4,670			$58,220	$62,890
D	73-fa-001 Cont. process area exh fan A & B	2	EA	40.0	95	24.59				5100	$2,340			$10,460	$12,800
D	73-fa-002 Curing rm. fan A/B	2	EA	80.0	190	24.59				9200	$4,670			$18,860	$23,530
D	73-fa-003A/B Stabilization Fac Exhaust Fan	2	EA	40.0	95	24.59				6400	$2,340			$13,120	$15,460
D	73-fl-001A/B Cont. proc arear filt. housing	2	EA	60.0	142	24.59				59800	$3,490			$122,590	$126,080
D	73-fl-002A-C Curing rm. filt. housing	3	EA	60.0	213	24.59				60000	$5,240			$184,500	$189,740
D	73-fl-003A-C Stabiliz. fac. filt. housing	3	EA	40.0	142	24.59				45000	$3,490			$138,380	$141,870
D	73-he-001 Unit heater	1	EA	10.0	12	24.59				7700	$300			$7,890	$8,190
D	73-st-001 Stabilization Facility stack	1	EA	240.0	285	24.59				180000	$7,010			$184,500	$191,510
D	73-he-003 Access contrl. rm. heater	1	EA	40.0	47	24.59				1700	$1,160			$1,740	$2,900
D	73-he-004 HVAC room heater	1	EA	60.0	71	24.59				14700	$1,750			$15,070	$16,820
D	73-he-005A/B & 006A/B heater	4	EA	80.0	379	24.59					$9,320				$9,320
	Equip. No.75 Description														
D	75-ah-001 Lab Air Handler	1	EA	40.0	47	24.59				7000	$1,160			$7,180	$8,340
D	75-ah-002 Lab Office Air Handler	1	EA	25.0	30	24.59				3000	$740			$3,080	$3,820
D	75-fa-001 Lab bldg. exhauster A & B	2	EA	45.0	107	24.59				2600	$2,630			$5,330	$7,960
D	75-fl-001 Lab bldg. HEPA Filter A-C	3	EA	50.0	178	24.59				15000	$4,380			$46,130	$50,510
	Equip. No.76 Description														
D	76-ah-001 Warehouse Office air condinr	1	EA	20.0	24	24.59				500	$590			$510	$1,100
D	76-ah-002 Mech/Elec Bldg Air Handler	1	EA	40.0	47	24.59				3000	$1,160			$3,080	$4,240
D	76-fa-002 Maint Shop Exhaust fan	1	EA	20.0	24	24.59				400	$590			$410	$1,000
D	76-fa-003 Electrical Room Exhaust fan	1	EA	20.0	24	24.59				400	$590			$410	$1,000
D	76-fa-005 Welding hood	1	EA	20.0	24	24.59				2000	$590			$2,050	$2,640
D	76-fa-007 M/E Building Exhauster	1	EA	20.0	24	24.59				1000	$590			$1,030	$1,620
D	76-he-001 Unit heater	1	EA	10.0	12	24.59				400	$300			$410	$710
D	76-he-002 Warehouse Office Heater	1	EA	10.0	12	24.59				100	$300			$100	$400
D	76-he-003A-F Warehouse Unit Heater	6	EA	10.0	71	24.59				1000	$1,750			$6,150	$7,900
D	76-me-001,002 Wall louver	2	EA	10.0	24	24.59				950	$590			$1,950	$2,540
	Equip. No.77 Description														
D	77-FA-001 Vent Fan	1	EA	20.0	24	24.59				1000	$590			$1,030	$1,620

000438

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 1 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
·2	77-he-001 Staging Facility Operator Heater	1	EA	10.0	12	24.59				100	$300			$100	$400
D	77-he-004 Cont. staging Unit heater A-F	6	EA	10.0	71	24.59				1000	$1,750			$6,150	$7,900
	Equip. No.80 Description														
D	80-cn-002 Maint. monorail A..E	1	EA	40.0	47	24.59				10000	$1,160			$10,250	$11,410
D	80-cn-003 Maint. shop crane	1	EA	80.0	95	24.59				45500	$2,340			$46,640	$48,980
D	80-se-001 Machine shop equip.	1	EA	200.0	237	24.59				90000	$5,830			$92,250	$98,080
D	80-se-002 Weld shop equip.	1	EA	125.0	148	24.59				22000	$3,640			$22,550	$26,190
D	80-se-003 Elect. shop equip.	1	EA	75.0	89	24.59				12000	$2,190			$12,300	$14,490
D	80-se-004 Pipe fab. shop equip.	1	EA	50.0	59	24.59				7000	$1,450			$7,180	$8,630
	Equip. No.82 Description														
D	82-cn-002 15 Ton Monorail hoist	1	EA	120.0	142	24.59				150000	$3,490			$153,750	$157,240
D	82-cn-003 15 Ton Bridge crane	1	EA	300.0	356	24.59				350000	$8,750			$358,750	$367,500
D	82-cn-004 15 Ton Bridge crane	1	EA	450.0	534	24.59				750000	$13,130			$768,750	$781,880
D	82-me-001 Container Fill station	1	EA	180.0	213	24.59				350000	$5,240			$358,750	$363,990
D	82-me-002 Head grapple/Absorbent Replcm	1	EA	180.0	213	24.59				110000	$5,240			$112,750	$117,990
D	82-me-003 Inspection Station	1	EA	180.0	213	24.59				200000	$5,240			$205,000	$210,240
D	82-me-005 Head Fastening station	1	EA	275.0	326	24.59				150000	$8,020			$153,750	$161,770
D	82-me-006 Sample storage station	1	EA	250.0	296	24.59				370000	$7,280			$379,250	$386,530
	Equip. No.83 Description														
D	83-sd-001/002 Airlock Shield door	2	EA	120.0	285	24.59				25000	$7,010			$51,250	$58,260
D	83-sd-003/004 Personnel Shielding Door	2	EA	85.0	202	24.59				15000	$4,970			$30,750	$35,720
D	83-sd-005/006 Airlock Shielding Door	2	EA	85.0	202	24.59				20000	$4,970			$41,000	$45,970
D	83-sd-007-010 Airlock Door	4	EA	85.0	403	24.59				15000	$9,910			$61,500	$71,410
D	83-sd-011 Airlock Shielding Door	1	EA	85.0	101	24.59				20000	$2,480			$20,500	$22,980
D	83-sd-012 Airlock Shielding Door(double)	1	EA	160.0	190	24.59				35000	$4,670			$35,880	$40,550
D	83-sd-013 Airlock Shielding Door	1	EA	85.0	101	24.59				22000	$2,480			$22,550	$25,030
D	83-sd-014 Airlock Shielding Door(double)	1	EA	120.0	142	24.59				17000	$3,490			$17,430	$20,920
D	83-sd-015 Airlock Shielding Door	1	EA	85.0	101	24.59				15000	$2,480			$15,380	$17,860
D	83-sd-016-025 Personnel Shielding Door	10	EA	85.0	1008	24.59				10000	$24,790			$102,500	$127,290
D	83-sw-001 Shield window A..E	5	EA	40.0	237	24.59				3600	$5,830			$18,450	$24,280
	Equip. No.84 Description														
D	84-gb-001 Sample glove/pass-thru station	1	EA	120.0	142	24.59				30000	$3,490			$30,750	$34,240
D	84-me-001 Sample Station	1	EA	200.0	237	24.59				260000	$5,830			$266,500	$272,330
D	73-st-002 HVAC stack	1	EA	120.0	142	24.59				87000	$3,490			$89,180	$92,670

7-8113

000439

DETAIL ESTIM... WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 1 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
.2	**Equip. No.85 Description**														
D	85-tv-001 CCTV inspec. station	1	LOT	780.0	925	24.59				300000	$22,750			$307,500	$330,250
	Equip. No.93 Description														
D	93-sa-001..005 Emerg. eyewash/ shower	5	EA	10.0	59	24.59				1000	$1,450			$5,130	$6,580
	Equip. No.94 Description														
D	94-se-001 Analylitical Laboratory Equip	1	LOT	300.0	356	24.59				1120000	$8,750			$1,148,000	$1,156,750
D	77-ah-001 staging fac. air conditioner	1	EA	20.0	24	24.59				500	$590			$510	$1,100
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		22,590	$24.60					555,700			10,756,300	$11,312,000

000440

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	500 - Piping	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
D	1. Install 1/2" c.s. gate valve	155	EA	1.2	221	24.59			61.5		$5,430		$9,770		$15,200
D	2. Install 3/4" c.s. gate valve	28	EA	1.3	43	24.59			69.75		$1,060		$2,000		$3,060
D	3. Install 2" c.s. gate valve	28	EA	1.7	56	24.59			207.75		$1,380		$5,960		$7,340
D	4. Install 1/2" s.s. gate valve	44	EA	1.3	68	24.59			257.25		$1,670		$11,600		$13,270
D	5. Install 3/4" s.s. gate valve	10	EA	1.4	17	24.59			316.05		$420		$3,240		$3,660
D	6. Install 2" s.s. gate valve	10	EA	1.9	23	24.59			717.15		$570		$7,350		$7,920
D	7. Install 1-1/2" s.s. check valve	6	EA	1.8	13	24.59			464.31		$320		$2,860		$3,180
D	8. Install 3" s.s. check valve	4	EA	4.1	19	24.59			1104.95		$470		$4,530		$5,000
D	. Relocate existing 30" drain line	150	LF	1.3	231	24.59					$5,680				$5,680
D	2 Install new (HDPE) drain line	300	LF	0.825	293	24.59			67.51		$7,200		$20,760		$27,960
D	11. Install bin loading lines	325	LF	0.53	204	24.59			13.45		$5,020		$4,480		$9,500
D	1. Install drain lines-cs pipe	1500	LF	0.4	699	24.59			8.48		$17,190		$13,040		$30,230
D	2. Install double cont. pipe	2100	LF	0.7	1728	24.59			14.72		$42,490		$31,680		$74,170
D	3. Install piping including valves bulk	1	LOT	5865	6954	24.59			144230		$171,000		$147,840		$318,840
	Firewater														
	1. Install 4" post indicator valves	1	EA	6.50	18	24.59			5200.00		$440		$5,330		$5,770
	2. Install 12" std. wt cs pipe	1240	LF	0.59	2050	24.59			42.65		$50,410		$54,210		$104,620
	3. Install 8" std. wt cs pipe	650	LF	0.41	743	24.59			25.71		$18,270		$17,130		$35,400
	4. Install 4" std. wt cs pipe	1100	LF	0.24	728	24.59			10.92		$17,900		$12,310		$30,210
	5. Install hydrants	21	EA	4.00	237	24.59			700.00		$5,830		$15,070		$20,900
	6. Install 4" gate valves	21	EA	4.00	237	24.59			850.00		$5,830		$18,300		$24,130
	7. Install valve boxes	21	EA	6.00	355	24.59			325.00		$8,730		$7,000		$15,730
	8. Install 4" post indicator valves	3	EA	8.00	68	24.59			1100.00		$1,670		$3,380		$5,050
	9. Install 8" post indicator valves	1	EA	12.00	34	24.59			2750.00		$840		$2,820		$3,660
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		15,039	$24.59					369,800		400,700		$770,500

000441

81113

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
.2															
D	3LTG-ANAL LAB, CONT'L RM	4248	SF	0.20	1007	21.12			4.30		$21,270		$18,720		$39,990
D	4. LTG-Waste process,M/E,whse,etc	62552	SF	0.05	3708	21.12			1.08		$78,310		$69,250		$147,560
D	5. Install lighting to On-Site Storage bldg	30712	SF	0.08	2731	21.12			1.62		$57,680		$51,000		$108,680
D	7. Install elect bulk non-process. instrum	1	LOT	45	53	21.12			637		$1,120		$650		$1,770
	Feed Preparation 15														
D	1. Install 480v pr. & mtr. feeders up to 10hp	8	EA	12.9	122	21.12			181.00		$2,580		$1,480		$4,060
D	2. Install 480v pr. & mtr. feeders 20,25,40hp	10	EA	13.2	156	21.12			164.00		$3,290		$1,680		$4,970
D	3. Install 1-1/2" seal. flex conduit	1	LOT	1.5	2	21.12			35.70		$40		$40		$80
D	4. Install start-stop station fac. sealed	18	EA	2.3	49	21.12			120.00		$1,030		$2,210		$3,240
D	5. Install 100a-600v LDS expl. proof	1	EA	4.2	5	21.12			335.00		$110		$340		$450
D	6. Install 3/4" cond. galv. stl.	4000	FT	0.08	379	21.12			0.95		$8,000		$3,900		$11,900
D	7. Install 1" cond. galv. stl.	5000	FT	0.11	652	21.12			1.44		$13,770		$7,380		$21,150
D	7. Install 1-1/2" cond. galv. stl.	500	FT	0.14	83	21.12			2.30		$1,750		$1,180		$2,930
D	8. Install 3/4"-L-flg. with cover & gasket	80	EA	1.0	95	21.12			9.90		$2,010		$810		$2,820
D	9. Install 1"-L-flg. with cover & gasket	100	EA	1.2	142	21.12			14.50		$3,000		$1,490		$4,490
D	9. Install 1-1/2"-L-flg. with cover & gasket	10	EA	2.0	24	21.12			27.00		$510		$280		$790
D	10. Install 3/4" cond. union UNY	32	EA	0.8	30	21.12			7.90		$630		$260		$890
D	11. Install 1" cond. union UNY	40	EA	1.0	47	21.12			13.40		$990		$550		$1,540
D	11. Install 1-1/2" cond. union UNY	6	EA	1.5	11	21.12			26.70		$230		$160		$390
D	12. Install 3/4" cond. seal "EYS"	9	EA	0.9	10	21.12			10.00		$210		$90		$300
D	13. Install 1" cond. seal "EYS"	11	EA	1.0	13	21.12			13.00		$270		$150		$420
D	13. Install 1-1/2" cond. seal "EYS"	1	EA	1.5	2	21.12			23.20		$40		$20		$60
D	14. Install 3/4" cond. hub	9	EA	0.8	9	21.12			4.40		$190		$40		$230
D	15. Install 1" cond. hub	11	EA	1.0	13	21.12			5.20		$270		$60		$330
D	15. Install 1-1/2" cond. hub	2	EA	1.0	2	21.12			7.90		$40		$20		$60
D	16. Install 3-#14cntrl. wire, str. cu 600v	9400	FT	0.03	301	21.12			0.21		$6,360		$2,020		$8,380
D	17. Install 3 #12w/ #12 grd. power wire	4120	FT	0.04	176	21.12			0.36		$3,720		$1,520		$5,240
D	18. Install 3 #8w/ #10 grd. power wire	4650	FT	0.05	292	21.12			0.60		$6,170		$2,860		$9,030

000442

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
·2	18. Install 3 #6w/ #8 grd. power wire	520	FT	0.06	36	21.12			0.85		$760		$450		$1,210
D	19. Install 3 #2w/ #8 grd. power wire	520	FT	0.08	47	21.12			1.66		$990		$880		$1,870
D	20. Install 1/c #14 wire term, 600v	108	EA	0.2	26	21.12			0.20		$550		$20		$570
D	21. Install 1/c #12 wire term, 600v	40	EA	0.2	9	21.12			0.25		$190		$10		$200
D	21. Install 1/c #10 wire term, 600v	9	EA	0.2	2	21.12			0.25		$40				
D	22. Install 1/c #8 wire term, 600v	29	EA	0.3	10	21.12			0.90		$210		$30		$240
D	22. Install 1/c #6 wire term, 600v	3	EA	0.4	1	21.12			1.00		$20				$20
D	23. Install 1/c #2 wire term, 600v	6	EA	0.4	3	21.12			2.45		$60		$20		$80
D	23. Install starter & fused disc. switch		EA	4.0		21.12			200.00						
D	24. Install 2- #4/0mtr. cont. kit, 600v		EA	1.0		21.12			30.00						
D	25. Install 14- #10 mtr. cont. kit, 600v	8	EA	0.5	5	21.12			12.00		$110		$100		$210
D	26. Install 8 - #4 mtr. cont. kit, 600v	10	EA	0.6	7	21.12			21.00		$150		$220		$370
D	27. Install flex cond. conn. assy	157	EA	1.1	205	21.12			14.00		$4,330		$2,250		$6,580
D	28. Install st. stl. box 20"x20"x6" w/term.	8	EA	10.3	98	21.12			630.00		$2,070		$5,170		$7,240
D	29. Install 3/4" galv. ridg. stl. conduit	3150	FT	0.08	299	21.12			0.95		$6,310		$3,070		$9,380
D	30. Install 1" galv. ridg. stl. conduit	740	FT	0.11	97	21.12			1.44		$2,050		$1,090		$3,140
D	31. Install1-1/2" galv. ridg. stl. conduit	670	FT	0.14	111	21.12			2.30		$2,340		$1,580		$3,920
D	32. Install 2" galv. ridg. stl. conduit	340	FT	0.17	69	21.12			3.08		$1,460		$1,070		$2,530
D	33. Install 3/4" "L" ftg. w/cover & gasket	138	EA	1.00	164	21.12			9.90		$3,460		$1,400		$4,860
D	34. Install 1" "L" ftg. w/cover & gasket	28	EA	1.20	40	21.12			14.50		$840		$420		$1,260
D	35. Install 1-1/2" "L" ftg. w/cover & gasket	28	EA	2.00	66	21.12			27.00		$1,390		$770		$2,160
D	36. Install 2" "L" ftg. w/cover & gasket	15	EA	2.50	44	21.12			42.00		$930		$650		$1,580
D	37. Install 3/4" "T" ftg. w/cover & gasket	152	EA	1.20	216	21.12			11.30		$4,560		$1,760		$6,320
D	38. Install 1" "T" ftg. w/cover & gasket	28	EA	1.50	50	21.12			16.60		$1,060		$480		$1,540
D	39. Install 1-1/2" "T" ftg. w/cover & gasket	28	EA	2.50	83	21.12			30.30		$1,750		$870		$2,620
D	40. Install 2" "T" ftg. w/cover & gasket	30	EA	3.00	107	21.12			46.30		$2,260		$1,420		$3,680
D	40. Install 2" Coundit hub	8	EA	1.90	18	21.12			11.00		$380		$90		$470
D	40. Install 2" Coundit seal "EYS"	8	EA	1.60	15	21.12			30.20		$320		$250		$570
D	41. Install 3/4" conduit union "UNY"	53	EA	0.80	50	21.12			7.90		$1,060		$430		$1,490
D	42. Install 1" conduit union "UNY"	11	EA	1.00	13	21.12			13.40		$270		$150		$420
D	43. Install 1-1/2" conduit union "UNY"	11	EA	1.50	20	21.12			26.70		$420		$300		$720
D	44. Install 2" conduit union "UNY"	7	EA	1.90	16	21.12			34.40		$340		$250		$590
D	47. Install 1/2" conduit drain	114	EA	0.20	27	21.12			25.00		$570		$2,920		$3,490

000443

- 81113

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
. 2	48. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	15600	FT	0.02	41	21.12			0.23		$870		$3,680		$4,550
D	49. Install 1pr-#16 wire termination, 300v	314	EA	0.40	149	21.12			0.30		$3,150		$100		$3,250
D	49. Miscellaneous and support materials	1	LOT	427.00	427	21.12					$9,020				$9,020
	Processor 17														
D	1. Install mtr. flex conduit conn. assy. up to	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	2. Install mtr. flex conduit conn. assy. up to	1	EA	11.1	13	21.12			219.00		$270		$220		$490
D	3. Install starter & fused disc. switch	3	EA	2.3	8	21.12			120.00		$170		$370		$540
D	4. Install 3/4" cond. galv. stl.	1200	FT	0.08	114	21.12			0.95		$2,410		$1,170		$3,580
D	5. Install 2" cond. galv. stl.	400	FT	0.17	81	21.12			3.08		$1,710		$1,260		$2,970
D	6. Install 3/4" "L" ftg. w/ cover & gasket	24	EA	1.00	28	21.12			9.90		$590		$240		$830
D	7. Install 2" "LBD" ftg. w/ cover & gasket	8	EA	2.50	24	21.12			54.20		$510		$440		$950
D	8. Install 3/4" cond. union "UNY"	10	EA	0.8	9	21.12			7.90		$190		$80		$270
D	9. Install 2" cond. union "UNY"	3	EA	1.9	7	21.12			34.40		$150		$110		$260
D	10. Install 3/4" cond. seal "EYS"	3	EA	0.9	3	21.12			10.00		$60		$30		$90
D	11. Install 2" cond. seal "EYS"	1	EA	1.6	2	21.12			30.20		$40		$30		$70
D	12. Install 3/4" cond. hub	3	EA	0.8	3	21.12			4.40		$60		$10		$70
D	13. Install 2" cond. hub	1	EA	1.9	2	21.12			11.00		$40		$10		$50
D	14. Install contrl. wire 3-#14	1250	FT	0.0	40	21.12			0.21		$840		$270		$1,110
D	15. Install power wire 3 #12 w/#12 grd.	830	FT	0.04	35	21.12			0.36		$740		$310		$1,050
D	16. Install power wire 3 #3/0 w/#4 grd.	420	FT	0.14	67	21.12			3.96		$1,420		$1,700		$3,120
D	17. Install wire term. , 600v, 1/c #14	18	EA	0.20	4	21.12			0.2		$80				$80
D	18. Install wire term. , 600v, 1/c #12	10	EA	0.20	2	21.12			0.25		$40				$40
D	19. Install wire term. , 600v, 1/c #4	2	EA	0.40	1	21.12			1.30		$20				$20
D	20. Install wire term. , 600v, 1/c #3/0	3	EA	1.00	4	21.12			3.80		$80		$10		$90
D	21. Install Mtr. cont. kit, 600v, #14 - #10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
D	22. Install Mtr. cont. kit, 600v, #2 - #4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	22. Miscellaneous and support material	1	LOT	45.00	53	21.12					$1,120				$1,120
	Processor 17 instrument wiring														
D	1. Install flex cond. conn. assy	27	EA	1.1	35	21.12			14.00		$740		$390		$1,130
D	2. Install st. stl. box 20"x20"x6" w/term.	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" galv. ridg. stl. conduit	600	FT	0.08	57	21.12			0.95		$1,200		$580		$1,780
D	4. Install 1" galv. ridg. stl. conduit	140	FT	0.11	18	21.12			1.44		$380		$210		$590
D	5. Install 3/4" "L" ftg. w/cover & gasket	26	EA	1.00	31	21.12			9.90		$650		$260		$910
D	6. Install 1" "L" ftg. w/cover & gasket	6	EA	1.20	9	21.12			14.50		$190		$90		$280

000444

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	7. Install 3/4" "T" ftg. w/cover & gasket	29	EA	1.20	35	21.12			11.30		$740		$340		$1,080
D	8. Install 1" conduit hub"T" ftg. w/cover & ga	6	EA	1.50	11	21.12			16.60		$230		$100		$330
D	9. Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	10. Install 2" conduit seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	11. Install 1-1/2" galv. ridg. stl. conduit	130	FT	0.14	22	21.12			2.30		$460		$310		$770
D	12. Install 2" galv. ridg. stl. conduit	60	FT	0.17	12	21.12			3.08		$250		$190		$440
D	13. Install 1/2" conduit drain	20	EA	0.20	5	21.12			25.00		$110		$510		$620
D	14. Install 1pr-#16 str cu shld. w/pvc jkt, 300	3000	FT	0.02	64	21.12			0.23		$1,350		$710		$2,060
D	15. Install 1pr-#16 wire termination, 300v	54	EA	0.40	26	21.12			0.30		$550		$20		$570
D	16. Miscellaneous and support material	1	LOT	33.00	39	21.12					$820				$820
	Container Receipt & Handling System 25														
D	1. Install motor flex conn. to 10 HP	17	LOT	12.9	260	21.12			181.00		$5,490		$3,150		$8,640
D	2. Install motor flex conn.to 20HP	1	LOT	13.2	16	21.12			164.00		$340		$170		$510
D	3. Install "push button station	18	EA	2.3	49	21.12			120.00		$1,030		$2,210		$3,240
D	4. Install 3/4" conduit galv. rigid stl.	5600	FT	0.08	531	21.12			0.95		$11,210		$5,450		$16,660
D	5. Install 1" conduit galv. rigid stl.	330	FT	0.11	43	21.12			1.44		$910		$490		$1,400
D	6. Install 3/4" "L" ftg. w/cover & gasket	112	EA	1.00	133	21.12			9.90		$2,810		$1,140		$3,950
D	6. Install 1" "L" ftg. w/cover & gasket	7	EA	1.20	10	21.12			14.50		$210		$100		$310
D	7. Install 3/4" conduit union "UNY"	45	EA	0.80	43	21.12			7.90		$910		$360		$1,270
D	7. Install 1" conduit union "UNY"	3	EA	1.00	4	21.12			13.40		$80		$40		$120
D	8. Install 3/4" conduit seal "EYS"	18	EA	0.90	19	21.12			10.00		$400		$180		$580
D	8. Install 1" conduit seal "EYS"	1	EA	1.00	1	21.12			13.00		$20		$10		$30
D	9. Install 3/4" conduit hub	18	EA	0.80	17	21.12			4.40		$360		$80		$440
D	9. Install 1" conduit hub	1	EA	1.00	1	21.12			5.20		$20		$10		$30
D	10. Install control wire 3#14	6200	FT	0.03	198	21.12			0.21		$4,180		$1,330		$5,510
D	11. Install power wire 3#12 w/ #12 grd.	5900	FT	0.04	252	21.12			0.36		$5,320		$2,180		$7,500
D	12. Install power wire 3#8 w/ #10 grd.	350	FT	0.05	22	21.12			0.60		$460		$220		$680
D	13. Install wire termination 1/c #14	108	EA	0.20	26	21.12			0.20		$550		$20		$570
D	14. Install wire termination 1/c #12	85	EA	0.20	20	21.12			0.25		$420		$20		$440
D	15. Install wire termination 1/c #10	2	EA	0.20		21.12			0.25						
D	16. Install wire termination 1/c #8	3	EA	0.30	1	21.12			0.90		$20				$20
D	17. 600 V motor conn #14-#10	17	EA	0.50	10	21.12			12.00		$210		$210		$420
D	18. Install mtr. conn #8-#4, 600v	1	EA	0.60	1	21.12			21.00		$20		$20		$40
D	19. Miscellaneous and support material	1	LOT	143.00	143	21.12					$3,020				$3,020

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 · Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
-2	Product Recycle 26														
D	1. Install 3/4" flex cond. w/ 2 conncectors	2	LOT	0.8	2	21.12			12.05		$40		$20		$60
D	2. Install motor flex cond. to 10 HP	5	EA	12.90	76	21.12			181.00		$1,610		$930		$2,540
D	2. Install motor flex cond. to 100 HP	1	EA	13.20	16	21.12			164.00		$340		$170		$510
D	4. Install push button station	8	EA	2.30	22	21.12			120.00		$460		$980		$1,440
D	5. Install 3/4" conduit galv. rigid stl.	2240	FT	0.08	212	21.12			0.95		$4,480		$2,180		$6,660
D	5. Install 1-1/2" conduit galv. rigid stl.	320	FT	0.14	53	21.12			2.30		$1,120		$750		$1,870
D	6. Install 3/4" "L" ftg. w/cover & gasket	49	EA	1.00	58	21.12			9.90		$1,220		$500		$1,720
D	7. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	21.12			27.00		$360		$190		$550
D	8. Install 3/4" conduit union "UNY"	20	EA	0.80	19	21.12			7.90		$400		$160		$560
D	9. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	10. Install 3/4" conduit seal "EYS"	8	EA	0.90	9	21.12			10.00		$190		$80		$270
D	11. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	12. Install 3/4" conduit hub	8	EA	0.80	8	21.12			4.40		$170		$40		$210
D	13. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	14. Install power wire 3#12 w/ #12 grd.	2010	FT	0.04	86	21.12			0.36		$1,820		$740		$2,560
D	14. Install power wire 3#10 w/ #10 grd.	340	FT	0.04	18	21.12			0.48		$380		$170		$550
D	15. Install power wire 3#2/0 w/ #4 grd.	340	FT	0.11	46	21.12			3.18		$970		$1,110		$2,080
D	16. Install wire term. 600v, 1/c #124	48	EA	0.20	11	21.12			0.20		$230		$10		$240
D	16. Install wire term. 600v, 1/c #12	33	EA	0.20	8	21.12			0.25		$170		$10		$180
D	16. Install wire term. 600v, 1/c #10	8	EA	0.20	2	21.12			0.25		$40				$40
D	17. Install wire term. 600v, 1/c #4	2	EA	0.40	1	21.12			1.30		$20				$20
D	18. Install wire term. 600v, 1/c #2/0	3	EA	0.80	3	21.12			3.20		$60		$10		$70
D	19. Install mtr. cont. kit, 600V, #14-#10	5	EA	0.50	3	21.12			12.00		$60		$60		$120
D	20. Install mtr. cont. kit, 600V, #2- #4/0	1	EA	1.00	1	21.12			30.00		$20		$30		$50
D	13. Miscellaneous and support material	1	LOT	66.00	78	21.12					$1,650				$1,650
	High Voltage 30														
D	30-UC-001 Utility Cabinet	1	EA	300.0	356	21.12			150000		$7,520		$153,750		$161,270
D	30-XT-001 Main Transformer	1	EA	290.0	344	21.12			150000		$7,270		$153,750		$161,020
D	3. Install 3" conduit galv. rigid stl.	60	FT	0.28	20	21.12			6.41		$420		$390		$810
D	4. Install 3" "LBD" ftg. w/cover & gasket	2	EA	4.50	11	21.12			160.50		$230		$330		$560
D	5. Install 3" conduit union "UNY"	2	EA	2.50	6	21.12			76.00		$130		$160		$290
D	6. Install 3" cond. hub	4	EA	2.50	12	21.12			33.30		$250		$140		$390
D	7. Install power wire 3#1/0 w/ #4 grd.	100	FT	0.17	20	21.12			8.11		$420		$830		$1,250

000446

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	8. Install wire term. 600v, 1/c #4	4	EA	0.40	5	21.12			1.30		$110		$10		$120
D	9. Install term. kit 15kv 1/c #2/0	12	EA	4.00	57	21.12			80.00		$1,200		$980		$2,180
D	13. Miscellaneous and support material	1	LOT	8.00	9	21.12					$190				$190
	480V Distribution 31														
D	31-MC-001 (MCC)	1	EA	160.00	190	21.12				85000	$4,010			$87,130	$91,140
D	31-MC-002 (MCC)	1	EA	160.00	190	21.12				85000	$4,010			$87,130	$91,140
D	31-MC-003 (MCC)	1	EA	160.00	190	21.12				70000	$4,010			$71,750	$75,760
D	31-MC-004 (MCC)	1	EA	160.00	190	21.12				85000	$4,010			$87,130	$91,140
D	31-MC-005 (MCC)	1	EA	160.00	190	21.12				85000	$4,010			$87,130	$91,140
D	31-MC-006 (MCC)	1	EA	95.00	113	21.12				60000	$2,390			$61,500	$63,890
D	7. Install 3" "LBD" ftg. w/ cover & gasket	15	EA	4.50	80	21.12			160.50		$1,690		$2,470		$4,160
D	9. Install mini-power xfmr/panel, 30kva	9	EA	50.00	534	21.12				3000	$11,280			$27,680	$38,960
D	10. Install 3" galv. ridgid stl. conduit	600	FT	0.28	199	21.12			6.41		$4,200		$3,940		$8,140
D	11. Install 3" conduit union "UNY"	15	EA	2.50	44	21.12			76.00		$930		$1,170		$2,100
D	12. Install 3" cond. hub	30	EA	2.50	89	21.12			33.30		$1,880		$1,020		$2,900
D	13. Install power wire 3#350KCMw/#1 grd	900	FT	0.20	214	21.12			8.18		$4,520		$7,550		$12,070
D	15. Install wire term. 600v, 1/c #10	30	EA	0.7	25	21.12			2.75		$530		$80		$610
D	16. Install wire term. 600v, 1/c #350kcm	90	EA	1.50	160	21.12			6.20		$3,380		$570		$3,950
D	17. Install 3" galv. ridg. stl. conduit	120	FT	0.28	40	21.12			6.41		$840		$790		$1,630
D	19. Install 3" "LBD"ftg w/ cover and gasket	3	EA	4.50	16	21.12			160.50		$340		$490		$830
D	11. Install 3" conduit union "UNY"	3	EA	2.50	9	21.12			76.00		$190		$230		$420
D	12. Install 3" cond. hub	6	EA	2.50	18	21.12			33.30		$380		$200		$580
D	13. Install power wire 3#350KCMw/#1 grd	180	FT	0.2	43	21.12			8.18		$910		$1,510		$2,420
D	13. Install15. Install wire term. 600v, 1/c #10	6	EA	0.7	5	21.12			2.75		$110		$20		$130
D	22. Install16. Install wire term. 600v, 1/c #35	18	EA	1.5	32	21.12			6.20		$680		$110		$790
D	23. Install 1-1/2" rigid galv cond.	40	FT	0.1	7	21.12			2.30		$150		$90		$240
D	24. Install 1-1/2" "L" ftg	2	EA	2.0	5	21.12			27.00		$110		$60		$170
D	11. Install 1-1/2" conduit union "UNY"	1	EA	1.5	2	21.12			26.70		$40		$30		$70
D	26. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	29. Install power wire 3#4w/#8 grd	60	FT	0.07	5	21.12			1.15		$110		$70		$180
D	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	31. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	30. Install 2" pvc sch 40 conduit U/G	700	FT	0.11	91	21.12			0.77		$1,920		$550		$2,470
D	31. Install 2" RSG 90 deg elbow	2	EA	1.20	3	21.12			69.60		$60		$140		$200

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	11. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	11. Install 2" conduit seal "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	12. Install 2" cond. hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	42. Install power wire 3#4 w/#8 grd	720	FT	0.05	45	21.12			1.15		$950		$850		$1,800
D	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	31. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	32. Install 1-1/2" rigid galv cond.	80	FT	0.14	13	21.12			2.30		$270		$190		$460
D	24. Install 1-1/2" "L" ftg	4	EA	2.0	9	21.12			27.00		$190		$110		$300
D	11. Install 1-1/2" conduit union "UNY"	1	EA	1.5	2	21.12			26.70		$40		$30		$70
D	26. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	29. Install power wire 3#4w/#8 grd	100	FT	0.07	8	21.12			1.15		$170		$120		$290
D	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	31. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	30. Install 2" pvc sch 40 conduit U/G	400	FT	0.11	52	21.12			0.77		$1,100		$320		$1,420
D	31. Install 2" RSG 90 deg elbow	2	EA	1.20	3	21.12			69.60		$60		$140		$200
D	11. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	11. Install 2" conduit seal "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	12. Install 2" cond. hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	42. Install power wire 3#4 w/#8 grd	420	FT	0.05	26	21.12			1.15		$550		$500		$1,050
D	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	31. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	32. Install 1-1/2" rigid galv cond.	250	FT	0.14	41	21.12			2.30		$870		$590		$1,460
D	24. Install 1-1/2" "L" ftg	10	EA	2.0	24	21.12			27.00		$510		$280		$790
D	11. Install 1-1/2" conduit union "UNY"	4	EA	1.5	7	21.12			26.70		$150		$110		$260
D	26. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	29. Install power wire 3#4w/#8 grd	270	FT	0.07	22	21.12			1.15		$460		$320		$780
D	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	31. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	30. Install 2" pvc sch 40 conduit U/G	200	FT	0.11	26	21.12			0.77		$550		$160		$710
D	31. Install 2" RSG 90 deg elbow	4	EA	1.20	6	21.12			69.60		$130		$290		$420
D	11. Install 2" conduit union "UNY"	4	EA	1.90	9	21.12			34.40		$190		$140		$330
D	11. Install 2" conduit seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	12. Install 2" cond. hub	4	EA	1.90	9	21.12			11.00		$190		$50		$240
D	42. Install power wire 3#4 w/#8 grd	240	FT	0.05	15	21.12			1.15		$320		$280		$600

000448

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	30. Install wire term. 600v, 1/c #8	4	EA	0.30	3	21.12			0.90		$60				$60
D	31. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	32. Install 1-1/2" rigid galv cond.	1400	FT	0.14	232	21.12			2.30		$4,900		$3,300		$8,200
D	24. Install 1-1/2" "L" ftg	56	EA	2.0	133	21.12			27.00		$2,810		$1,550		$4,360
D	11. Install 1-1/2" conduit union "UNY"	20	EA	1.5	36	21.12			26.70		$760		$550		$1,310
D	26. Install 1-1/2" conduit hub	8	EA	1.50	14	21.12			7.90		$300		$60		$360
D	29. Install power wire 3#4w/#8 grd	1480	FT	0.07	119	21.12			1.15		$2,510		$1,740		$4,250
D	30. Install wire term. 600v, 1/c #8	8	EA	0.30	3	21.12			0.90		$60		$10		$70
D	31. Install wire term. 600v, 1/c #4	24	EA	0.40	11	21.12			1.30		$230		$30		$260
D	30. Install 2" pvc sch 40 conduit U/G	430	FT	0.11	56	21.12			0.77		$1,180		$340		$1,520
D	31. Install 2" RSG 90 deg elbow	2	EA	1.20	3	21.12			69.60		$60		$140		$200
D	11. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	11. Install 2" conduit seal "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	12. Install 2" cond. hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	42. Install power wire 3#4 w/#8 grd	450	FT	0.05	28	21.12			1.15		$590		$530		$1,120
D	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	31. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	Machine trenching	276	CY	0.30	98	19.64					$1,920				$1,920
D	Backfill and compaction	209	CY	0.40	99	19.64					$1,940				$1,940
D	Load haul and dump	110	CY	0.10	13	19.64					$260				$260
D	Ductbank	96	CY	3.80	433	20.34			92.00		$8,810		$9,050		$17,860
D	13. Miscellaneous and support material	1	LOT	157.00	157	21.12					$3,320				$3,320
	Standby Electrical 32														
D	1. Install generator 700kw,(32-eg-001)	1	EA	130.0	154	21.12				100000	$3,250			$102,500	$105,750
D	2. Install Transfer Switch (30-TS-001)	1	EA	60.0	71	21.12					$1,500			incl w/ Genera	$1,500
D	3. Install 3" conduit galv. rigid stl.	510	FT	0.28	169	21.12			6.41		$3,570		$3,350		$6,920
D	4. Install 3" "LBD" ftg. w/cover & gasket	18	EA	4.50	96	21.12			160.50		$2,030		$2,960		$4,990
D	5. Install 3" conduit union "UNY"	9	EA	2.50	27	21.12			76.00		$570		$700		$1,270
D	7. Install 3" cond. hub	18	EA	2.50	53	21.12			33.30		$1,120		$610		$1,730
D	8. Install power wire 3#350kcm w/ #1/0 grd	690	FT	0.20	164	21.12			8.18		$3,460		$5,790		$9,250
D	9. Install wire term. 600v, 1/c #10	18	EA	0.70	15	21.12			2.75		$320		$50		$370
D	10. Install wire term. 600v, 1/c #350kcm	54	EA	1.50	96	21.12			6.20		$2,030		$340		$2,370
D	13. Miscellaneous and support material	1	LOT	43.00	51	21.12					$1,080				$1,080
D	14. Install Switchgear (32-sg-001)	1	EA	35.0	41	21.12					$870			incl w/ Genera	$870

000449

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Uninterruptible Power 33														
D	1. Install uninterruptible power sply(up-33-0	1	EA	140.0	166	21.12				33000	$3,510			$33,830	$37,340
D	2. Install local disc. switch 60a-600v	1	EA	3.5	4	21.12			335.00		$80		$340		$420
D	3. Install 1-1/2" conduit galv. rigid stl.	200	FT	0.14	33	21.12			2.30		$700		$470		$1,170
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	21.12			27.00		$360		$190		$550
D	5. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	6. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	7. Install 1-1/2" cond. hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire 3#4 w/ #8 grd.	215	FT	0.07	17	21.12			1.15		$360		$250		$610
D	9. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	13. Miscellaneous and support material	1	LOT	8.00	9	21.12					$190				$190
	Lighting 34														
D	1. Install rnd. stl. pole w/2" tenon	20	EA	12.0	285	21.12			910.00		$6,020		$18,660		$24,680
D	2. Install stl. arm w/fittings	12	EA	4.0	57	21.12			160.00		$1,200		$1,970		$3,170
D	3. Install stl. brkt. for floodlights	17	EA	1.00	20	21.12			90.00		$420		$1,570		$1,990
D	4. Install rdwy. fixt. 400w w/lamp	12	EA	3.60	51	21.12			370.00		$1,080		$4,550		$5,630
D	5. Install fldlght fixt. 250w w/lamp	37	EA	3.30	145	21.12			300.00		$3,060		$11,380		$14,440
D	6. Install 1" pvc sch.40 conduit	2300	FT	0.07	191	21.12			0.37		$4,030		$870		$4,900
D	7. Install 1" rsg conduit elbow	44	EA	0.40	21	21.12			17.50		$440		$790		$1,230
D	8. Install 1" sealing hub	44	EA	0.80	42	21.12			14.60		$890		$660		$1,550
D	9. Install 1-1/2" insult. grd. bushing	44	EA	0.80	42	21.12			12.60		$890		$570		$1,460
D	10. Install #2 grd. wire cont. type "KC"	22	EA	0.50	13	21.12			14.80		$270		$330		$600
D	11. Install str. cu 600v, 3#10 w/ #10 grd.	2500	FT	0.04	130	21.12			0.48		$2,750		$1,230		$3,980
D	12. Install str. cu 600v, 3#12 w/ #12 grd.	800	FT	0.04	34	21.12			0.36		$720		$300		$1,020
D	13. Install mach. trench. for lighting	357	CY	0.30	127	21.12					$2,680				$2,680
D	14. Install mach. excav. for lighting	116	CY	0.50	69	21.12					$1,460				$1,460
D	15. Backfill & compact	381	CY	0.40	181	19.64					$3,550				$3,550
D	16. Load, haul & dump	163	CY	0.10	19	19.64					$370				$370
D	17. Install concrete elect. ductbank	126	CY	3.8	568	19.64			92.00		$11,160		$11,880		$23,040
D	18. Install concrete stl. pole footing	18	CY	16.9	361	20.34			176.00		$7,340		$3,250		$10,590
	Grounding 35														
D	1. Install grd. well assy.	44	EA	8.0	417	21.12			143.00		$8,810		$6,450		$15,260
D	2. Install grd. test bar assy.	14	EA	7.7	128	21.12			169.00		$2,700		$2,430		$5,130

000450

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	3. Install power transf. grdg.	2	EA	3.60	9	21.12			51.50		$190		$110		$300
D	4. Install switchgear grdg.	2	EA	2.50	6	21.12			56.50		$130		$120		$250
D	5. Install MCC grounding	8	EA	2.50	24	21.12			56.50		$510		$460		$970
D	6. Install storage tank grndg.	20	EA	1.00	24	21.12			17.80		$510		$360		$870
D	7 Vessel or exchanger grdg	2	EA	2.30	5	21.12			25.40		$110		$50		$160
D	8. Install stl. colm. grdg.	102	EA	1.00	121	21.12			17.80		$2,560		$1,860		$4,420
D	9. Install fence post grdg.	6	EA	1.00	7	21.12			57.20		$150		$350		$500
D	10. Install fence gate grdg.	2	EA	2.70	6	21.12			148.80		$130		$310		$440
D	11. Install miscl. equip. grdg.	10	EA	1.00	12	21.12			17.80		$250		$180		$430
D	12. Install #4/0 to #4/0 "T" weld	60	EA	2.00	142	21.12			10.15		$3,000		$620		$3,620
D	13. Install #4/0 to #2 "T" weld	110	EA	2.00	261	21.12			7.55		$5,510		$850		$6,360
D	14. Install 1/c #2 str. cu grd. wire	2500	FT	0.03	89	21.12			0.49		$1,880		$1,260		$3,140
D	15. Install 1/c #4/o str. cu grd. wire	4500	FT	0.02	107	21.12			1.47		$2,260		$6,780		$9,040
D	16. Install mach. excav. for grd. well	4	CY	0.50	2	19.64					$40				$40
D	17. Install mach. trench. for grd. wire	224	CY	0.3	80	19.64					$1,570				$1,570
D	18. Backfill & compaction	261	CY	0.4	124	19.64					$2,440				$2,440
	Lightning Protection 36														
D	1. Install air term. w/ base 3/8" x 10" rf. mtd	50	EA	1.2	71	21.12			25.00		$1,500		$1,280		$2,780
D	2. Install #2/0 str. cu wire	1800	FT	0.03	53	21.12			0.94		$1,120		$1,730		$2,850
D	3. Install #2/0 - #4/0 "T" exothermic weld	10	EA	2.00	24	21.12			7.55		$510		$80		$590
D	13. Miscellaneous and support material	1	LOT	37.00	44	21.12					$930				$930
	Plant & Instrument Air 40														
D	1. Install mtr. flex cond. conn. assy. 10hp	1	EA	12.9	15	21.12			181.00		$320		$190		$510
D	2. Install mtr. flex cond. conn. assy. 100hp	1	EA	10.10	12	21.12			187.00		$250		$190		$440
D	3. Install 3/4" sealtite flex conmd w/2 conct	2	LOT	0.80	2	21.12			12.05		$40		$20		$60
D	4. Install starter & fused disc. switch	2	EA	2.50	6	21.12			150.00		$130		$310		$440
D	5. Install start-stop button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	6. Install 3/4" conduit galv. stl.	520	FT	0.08	49	21.12			0.95		$1,030		$510		$1,540
D	7. Install 2" conduit galv. stl.	130	FT	0.17	26	21.12			2.30		$550		$310		$860
D	8. Install 3/4" "L" ftg. w/ cover & gasket	20	EA	1.00	24	21.12			9.90		$510		$200		$710
D	9. Install 1-1/2" "LBD" ftg. w/ cover & gaske	3	EA	2.00	7	21.12			27.00		$150		$80		$230
D	10. Install 3/4" conduit union "UNY"	8	EA	0.80	8	21.12			7.90		$170		$60		$230
D	11. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	12. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	13. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	14. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	15. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	16. Install cntrl. wire str. cu 3#14	290	FT	0.03	9	21.12			0.21		$190		$60		$250
D	17. Install power wire str. cu 3#12 w/#12grd	435	FT	0.04	19	21.12			0.36		$400		$160		$560
D	19. Install wire term. 600v 1/c#14	12	EA	0.20	3	21.12			0.20		$60				$60
D	20. Install wire term. 600v 1/c#12	24	EA	0.20	6	21.12			0.25		$130		$10		$140
D	21. Install wire term. 600v 1/c#4	2	EA	0.40	1	21.12			1.30		$20				$20
D	22. Install wire term. 600v 1/c#4/0	6	EA	1.10	8	21.12			3.20		$170		$20		$190
D	23. Install mtr. cont. kit 600v #14-#10	1	EA	0.50	1	21.12			12.00		$20		$10		$30
D	24. Install mtr. cont. kit 600v #2-#4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	13. Miscellaneous and support material	1	LOT	19.00	23	21.12					$490				$490
	Breathing Air System 41														
D	1. Install motor flex cond. 50hp	2	EA	15.9	38	21.12			247		$800		$510		$1,310
D	2. Install starter & fused disct. switch	2	EA	2.3	5	21.12			120.00		$110		$250		$360
D	3. Install 1-1/2" conduit galv. rigid stl.	800	FT	0.14	133	21.12			2.30		$2,810		$1,890		$4,700
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	16	EA	2.00	38	21.12			27.00		$800		$440		$1,240
D	5. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	6. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	21.12			23.20		$60		$50		$110
D	7. Install 1-1/2" cond. hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire 3#4 w/ #8 grd.	830	FT	0.07	67	21.12			1.15		$1,420		$980		$2,400
D	9. Install wire term. 600v, 1/c #8	4	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	11. Install mtr. cont. kit 600v #8-#4	2	EA	0.60	1	21.12			21.00		$20		$40		$60
D	13. Miscellaneous and support material	1	LOT	30.00	36	21.12					$760				$760
	Cold Chemical System 43														
D	1. Install motor flex conn. to 15 HP	8	EA	12.9	122	21.12			181.00		$2,580		$1,480		$4,060
D	2. Install push button station	8	EA	2.3	22	21.12			120.00		$460		$980		$1,440
D	3. Install 3/4" conduit galv. rigid stl.	3200	FT	0.08	304	21.12			0.95		$6,420		$3,120		$9,540
D	4. Install 3/4" "L" ftg. w/cover & gasket	64	EA	1.00	76	21.12			9.90		$1,610		$650		$2,260
D	5. Install 3/4" conduit union "UNY"	48	EA	0.80	46	21.12			7.90		$970		$390		$1,360
D	6. Install 3/4" conduit seal "EYS"	9	EA	0.90	10	21.12			10.00		$210		$90		$300
D	7. Install 3/4" cond. hub	9	EA	0.80	9	21.12			4.40		$190		$40		$230
D	Install control wire 3#14	3360	LF	0.03	108	21.12			0.21		$2,280		$720		$3,000

000452

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	8. Install power wire 3#12 w/ #12 grd.	3360	FT	0.04	107	21.12			0.36		$2,260		$1,240		$3,500
D	9. Install wire term. 600v, 1/c #14	48	EA	0.20	11	21.12			0.20		$230		$10		$240
D	9. Install wire term. 600v, 1/c #12	64	EA	0.20	15	21.12			0.25		$320		$20		$340
D	10. Install mtr. cont. kit 600v #14-#10	8	EA	0.50	5	21.12			12.00		$110		$100		$210
D	13. Miscellaneous and support material	1	LOT	75.00	75	21.12					$1,580				$1,580
	Product Additive 44														
D	2. Install motor flex conn. to 10HP	6	EA	12.90	92	21.12			181.00		$1,940		$1,110		$3,050
D	3. Install push button station	6	EA	2.30	16	21.12			120.00		$340		$740		$1,080
D	4. Install 3/4" sealtite flex cond.	5	EA	0.80	5	21.12			12.05		$110		$60		$170
D	6. Install 3/4" conduit galv. stl.	4600	FT	0.08	436	21.12			0.95		$9,210		$4,480		$13,690
D	8. Install 3/4" "L" ftg. w/ cover & gasket	92	EA	1.00	109	21.12			9.90		$2,300		$930		$3,230
D	10. Install 3/4" conduit union "UNY"	37	EA	0.80	35	21.12			7.90		$740		$300		$1,040
D	12. Install 3/4" conduit seal "EYS"	12	EA	0.90	13	21.12			10.00		$270		$120		$390
D	14. Install 3/4" conduit hub	12	EA	0.80	11	21.12			4.40		$230		$50		$280
D	17. Install power wire str. cu 3#12 w/#12grd	4800	FT	0.04	205	21.12			0.36		$4,330		$1,770		$6,100
D	18. Install control wire 3#14	3800	FT	0.03	122	21.12			0.21		$2,580		$820		$3,400
D	20. Install wire term. 600v 1/c#14	36	EA	0.20	9	21.12			0.20		$190		$10		$200
D	21. Install wire term. 600v 1/c#12	70	EA	0.20	17	21.12			0.25		$360		$20		$380
D	23. Install mtr. cont. kit 600v #14-#10	6	EA	0.50	4	21.12			12.00		$80		$70		$150
D	13. Miscellaneous and support material	1	LOT	100.00	100	21.12					$2,110				$2,110
	Recycle Water Flush 56														
D	1. Install mtr. flex cond. conn. assy. 15hp	1	EA	12.9	15	21.12			161.00		$320		$170		$490
D	2. Install start-stop button station	1	EA	2.30	3	21.12			120.00		$60		$120		$180
D	3. Install 3/4" conduit galv. stl.	330	FT	0.08	31	21.12			0.95		$650		$320		$970
D	4. Install 3/4" "L" ftg. w/ cover & gasket	6	EA	1.00	7	21.12			9.90		$150		$60		$210
D	5. Install 3/4" conduit union "UNY"	3	EA	0.80	3	21.12			7.90		$60		$20		$80
D	6. Install 3/4" conduit seal "EYS"	1	EA	0.90	1	21.12			10.00		$20		$10		$30
D	7. Install 3/4" conduit hub	1	EA	0.80	1	21.12			4.40		$20				$20
D	8. Install cntrl. wire 600v, 3#14	350	FT	0.03	11	21.12			0.21		$230		$80		$310
D	9. Install power wire 3#10 w/ #10 grd.	350	FT	0.04	18	21.12			0.48		$380		$170		$550
D	10. Install wire term. 600v, 1/c #14	6	EA	0.20	1	21.12			0.20		$20				$20
D	11. Install wire term. 600v, 1/c #10	8	EA	0.20	2	21.12			0.25		$40				$40

000453

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	12. Install mtr. conct. kit, 600v #14-#10	1	EA	0.50	1	21.12			12.00		$20		$10		$30
D	13. Miscellaneous and support material	1	LOT	8.00	9	21.12					$190				$190
	Container Decon System 57														
D	1. Install mtr. flex cond. conn. assy. 20hp	2	EA	13.2	31	21.12			164.00		$650		$340		$990
D	2. Install start-stop button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	1-1/2" Sealtite flex conn.	2	LOT	1.50	4	21.12			35.70		$80		$70		$150
D	Disconnect switch,60A,600V	2	EA	4.20	10	21.12			335.00		$210		$690		$900
D	3. Install 1" conduit galv. stl.	1400	FT	0.14	232	21.12			2.30		$4,900		$3,300		$8,200
D	4. Install 1" "L" ftg. w/ cover & gasket	28	EA	2.00	66	21.12			27.00		$1,390		$770		$2,160
D	5. Install 1" conduit union "UNY"	12	EA	1.50	21	21.12			26.70		$440		$330		$770
D	6. Install 1" conduit seal "EYS"	4	EA	1.40	7	21.12			23.20		$150		$100		$250
D	7. Install 1" conduit hub	4	EA	1.50	7	21.12			7.90		$150		$30		$180
D	8. Install cntrl. wire 600v, 3#14	730	FT	0.03	23	21.12			0.21		$490		$160		$650
D	9. Install power wire 3#8 w/ #10 grd.	730	FT	0.05	46	21.12			0.60		$970		$450		$1,420
D	9. Install power wire 3#6 w/ #8 grd.	730	FT	0.06	51	21.12			0.85		$1,080		$640		$1,720
D	10. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	11. Install wire term. 600v, 1/c #10	4	EA	0.20	1	21.12			0.25		$20				$20
D	10. Install wire term. 600v, 1/c #8	10	EA	0.30	4	21.12			0.90		$80		$10		$90
D	11. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	12. Install mtr. conct. kit, 600v #8-#4	2	EA	0.60	1	21.12			21.00		$20		$40		$60
D	13. Miscellaneous and support material	1	LOT	46.00	55	21.12					$1,160				$1,160
	Non-Radioactive Waste System 61														
D	1. Install mtr. flex cond. conn. assy. 10hp	10	EA	12.9	153	21.12			181.00		$3,230		$1,860		$5,090
D	2. Install start-stop button station	10	EA	2.30	27	21.12			120.00		$570		$1,230		$1,800
D	3. Install 3/4" conduit galv. stl.	3500	FT	0.08	332	21.12			0.95		$7,010		$3,410		$10,420
D	4. Install 3/4" "L" ftg. w/ cover & gasket	70	EA	1.00	83	21.12			9.90		$1,750		$710		$2,460
D	5. Install 3/4" conduit union "UNY"	30	EA	0.80	28	21.12			7.90		$590		$240		$830
D	6. Install 3/4" conduit seal "EYS"	11	EA	0.90	12	21.12			9.50		$250		$110		$360
D	7. Install 3/4" conduit hub	11	EA	0.80	10	21.12			4.40		$210		$50		$260
D	8. Install cntrl. wire 600v, 3#14	3650	FT	0.03	117	21.12			0.21		$2,470		$790		$3,260
D	9. Install power wire 3#12 w/ #12 grd.	3650	FT	0.04	190	21.12			0.36		$4,010		$1,350		$5,360
D	10. Install wire term. 600v, 1/c #14	60	EA	0.20	14	21.12			0.20		$300		$10		$310
D	11. Install wire term. 600v, 1/c #12	80	EA	0.20	19	21.12			0.25		$400		$20		$420
D	12. Install mtr. conct. kit, 600v #14-#10	10	EA	0.50	6	21.12			12.00		$130		$120		$250

004454

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
-2	13. Miscellaneous and support material	1	LOT	82.00	82	21.12					$1,730				$1,730
	Radioactive Waste System 64														
D	1. Install mtr. flex cond. conn. assy. 10hp	14	EA	12.9	214	21.12			181.00		$4,520		$2,600		$7,120
D	2. Install start-stop button station	14	EA	2.30	38	21.12			120.00		$800		$1,720		$2,520
D	3. Install 3/4" conduit galv. stl.	4900	FT	0.08	465	21.12			0.95		$9,820		$4,770		$14,590
D	4. Install 3/4" "L" ftg. w/ cover & gasket	98	EA	1.00	116	21.12			9.90		$2,450		$990		$3,440
D	5. Install 3/4" conduit union "UNY"	42	EA	0.80	40	21.12			7.90		$840		$340		$1,180
D	6. Install 3/4" conduit seal "EYS"	15	EA	0.90	16	21.12			10.00		$340		$150		$490
D	7. Install 3/4" conduit hub	15	EA	0.80	14	21.12			4.40		$300		$70		$370
D	8. Install cntrl. wire 600v, 3#14	5110	FT	0.03	164	21.12			0.21		$3,460		$1,100		$4,560
D	9. Install power wire 3#12 w/ #12 grd.	5110	FT	0.04	267	21.12			0.36		$5,640		$1,890		$7,530
D	10. Install wire term. 600v, 1/c #14	84	EA	0.20	20	21.12			0.20		$420		$20		$440
D	11. Install wire term. 600v, 1/c #12	112	EA	0.20	27	21.12			0.25		$570		$30		$600
D	12. Install mtr. conct. kit, 600v #14-#10	14	EA	0.50	8	21.12			12.00		$170		$170		$340
D	13. Miscellaneous and support material	1	LOT	116.00	116	21.12					$2,450				$2,450
	Radioactive Liquid Waste System 62														
D	Motor flex conduit conn. to 10 HP	7	EA	12.90	107	21.12			181.00		$2,260		$1,300		$3,560
D	Motor flex conduit conn. to 20 HP	6	EA	13.20	94	21.12			164.00		$1,990		$1,010		$3,000
D	3/4" Sealtite flex cond.	5	EA	0.80	5	21.12			12.50		$110		$60		$170
D	Push botton station	13	EA	2.30	35	21.12			120.00		$740		$1,600		$2,340
D	3/4" Galv rigid cond.	4800	LF	0.08	455	21.12			0.95		$9,610		$4,670		$14,280
D	1" Galv rigid cond.	2400	LF	0.11	313	21.12			1.44		$6,610		$3,540		$10,150
D	3/4" "L" ftg w cover and gasket	96	EA	1.00	114	21.12			9.90		$2,410		$970		$3,380
D	1" "L" ftg w cover and gasket	48	EA	1.20	68	21.12			14.50		$1,440		$710		$2,150
D	3/4" Conduit union "UNY"	40	EA	0.80	38	21.12			7.90		$800		$320		$1,120
D	1" Conduit union "UNY"	20	EA	1.00	24	21.12			13.40		$510		$270		$780
D	3/4" Conduit seal "EYS"	14	EA	0.90	15	21.12			10.00		$320		$140		$460
D	1" Conduit seal "EYS"	7	EA	1.00	8	21.12			13.00		$170		$90		$260
D	3/4" Conduit hub	14	EA	0.80	13	21.12			4.40		$270		$60		$330
D	1" Conduit hub	7	EA	1.00	8	21.12			5.20		$170		$40		$210
D	Control wire 3#14	5460	LF	0.03	175	21.12			0.21		$3,700		$1,180		$4,880
D	Power wire 3#12 w/#12 grd	5040	LF	0.04	215	21.12			0.36		$4,540		$1,860		$6,400
D	Power wire 3#8 w/#10 grd	2520	LF	0.05	158	21.12			0.60		$3,340		$1,550		$4,890
D	Wire term 1/c #14	78	EA	0.20	18	21.12			0.20		$380		$20		$400

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Wire term 1/c #12	72	EA	0.20	19	21.12			0.25		$400		$20		$420
D	Wire term 1/c #10	12	EA	0.20	3	21.12			0.25		$60				$60
D	Wire term 1/c #8	18	EA	0.20	4	21.12			0.90		$80		$20		$100
D	Motor conn. kit #14-#10	7	EA	0.50	4	21.12			12.00		$80		$90		$170
D	Motor conn. kit #8-#4	6	EA	0.60	4	21.12			21.00		$80		$130		$210
D	13. Miscellaneous and support material	1	LOT	177.00	177	21.12					$3,740				$3,740
	Product Handling Bldg. HVAC 73														
D	Motor flex conn. to 15 hp, 20hp	5	EA	12.90	76	21.12			181.00		$1,610		$930		$2,540
D	Motor flex conn. to 25 hp, 30hp	4	EA	13.20	63	21.12			164.00		$1,330		$670		$2,000
D	Push button station	11	EA	2.30	30	21.12			120.00		$630		$1,350		$1,980
D	Disconnect switch 30 A,600 V	1	EA	3.50	4	21.12			335.00		$80		$340		$420
D	Disconnect switch 60 A,600 V	1	EA	6.20	7	21.12			510.00		$150		$520		$670
D	Disconnect switch 200 A,600 V	1	EA	8.90	11	21.12			1050.00		$230		$1,080		$1,310
D	1. Install 3/4" flex cond. w/ 2 conncectors	1	LOT	0.8	1	21.12			12.05		$20		$10		$30
D	3. Install 2" flex cond. w/2 connectors	7	LOT	2.00	17	21.12			61.80		$360		$440		$800
D	3. Install 3" flex cond. w/2 connectors	3	LOT	3.50	12	21.12			334.00		$250		$1,030		$1,280
D	5. Install 3/4" conduit galv. rigid stl.	1200	FT	0.08	114	21.12			0.95		$2,410		$1,170		$3,580
D	6. Install 1-1/2" conduit galv. rigid stl.	800	FT	0.14	133	21.12			2.30		$2,810		$1,890		$4,700
D	7. Install 3" conduit galv. rigid stl.	2400	FT	0.28	797	21.12			6.41		$16,830		$15,770		$32,600
D	8. Install 3/4" "L" ftg. w/cover & gasket	24	EA	1.00	28	21.12			9.90		$590		$240		$830
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	16	EA	2.00	38	21.12			27.00		$800		$440		$1,240
D	3"-"LBD" ftg with cover and gasket	48	EA	4.50	256	21.12			160.00		$5,410		$7,870		$13,280
D	11. Install 3/4" conduit union "UNY"	9	EA	0.80	9	21.12			7.90		$190		$70		$260
D	12. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	13. Install 3" conduit union "UNY"	18	EA	2.50	53	21.12			76.00		$1,120		$1,400		$2,520
D	14. Install 3/4" conduit seal "EYS"	9	EA	0.90	10	21.12			10.00		$210		$90		$300
D	15. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	21.12			23.20		$60		$50		$110
D	16. Install 3" conduit seal "EYS"	6	EA	2.10	15	21.12			59.40		$320		$370		$690
D	17. Install 3/4" conduit hub	3	EA	0.80	3	21.12			4.40		$60		$10		$70
D	18. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	19. Install 3" conduit hub	6	EA	2.50	18	21.12			33.30		$380		$200		$580
D	Control wire 3#14	4620	FT	0.03	148	21.12			0.21		$3,130		$990		$4,120
D	20. Install power wire 3#12 w/ #12 grd.	840	FT	0.04	36	21.12			0.48		$760		$410		$1,170
D	21. Install power wire 3#10 w/ #10 grd.	2520	FT	0.05	158	21.12			0.60		$3,340		$1,550		$4,890

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	22. Install power wire 3#1 w/ #6 grd.	840	FT	0.06	45	21.12			0.85		$950		$730		$1,680
D	23. Install power wire 3#500 w/ #1/0 grd.	2520	FT	0.20	601	21.12			8.18		$12,690		$21,130		$33,820
D	24. Install wire term. 600v, 1/c #14	66	EA	0.20	16	21.12			0.20		$340		$10		$350
D	24. Install wire term. 600v, 1/c #12	28	EA	0.20	7	21.12			0.25		$150		$10		$160
D	25. Install wire term. 600v, 1/c #10	8	EA	0.30	3	21.12			0.90		$60		$10		$70
D	26. Install wire term. 600v, 1/c #6	12	EA	0.40	6	21.12			1.00		$130		$10		$140
D	27. Install wire term. 600v, 1/c #1	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	28. Install wire term. 600v, 1/c #1/0	14	EA	0.50	8	21.12			2.45		$170		$40		$210
D	29. Install wire term. 600v, 1/c #500	42	EA	1.10	55	21.12			4.30		$1,160		$190		$1,350
D	30. Install mtr. cont. kit, 600V, #14-#10	9	EA	0.60	6	21.12			21.00		$130		$190		$320
D	13. Miscellaneous and support material	1	LOT	75.00	75	21.12					$1,580				$1,580
	Analytical Lab. HVAC System 75														
D	Motor flex conduit conn to 10 HP	2	EA	12.90	31	21.12			181.00		$650		$370		$1,020
D	Push button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	Disconnect switch,30 A,600V	11	EA	2.50	33	21.12			150.00		$700		$1,690		$2,390
D	Disconnect switch,60 A,600V	1	EA	3.50	4	21.12			335.00		$80		$340		$420
D	1. Install 3/4" flex cond. w/ 2 conncectors	11	LOT	0.8	10	21.12			12.05		$210		$140		$350
D	2. Install 1-1/2" flex cond. w/2 connectors	1	LOT	1.50	2	21.12			35.70		$40		$40		$80
D	4. Install 3/4" conduit galv. rigid stl.	3250	FT	0.08	308	21.12			0.95		$6,500		$3,160		$9,660
D	5. Install 1-1/2" conduit galv. rigid stl.	250	FT	0.14	41	21.12			2.30		$870		$590		$1,460
D	6. Install 3/4" "L" ftg. w/cover & gasket	65	EA	1.00	77	21.12			9.90		$1,630		$660		$2,290
D	7. Install 1-1/2" "L" ftg. w/cover & gasket	5	EA	2.00	12	21.12			27.00		$250		$140		$390
D	8. Install 3/4" conduit union "UNY"	26	EA	0.80	25	21.12			7.90		$530		$210		$740
D	9. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	10. Install 3/4" conduit seal "EYS"	14	EA	0.90	15	21.12			10.00		$320		$140		$460
D	11. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	12. Install 3/4" conduit hub	14	EA	0.80	13	21.12			4.40		$270		$60		$330
D	13. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	Install control wire 3#14	540	FT	0.03	17	21.12			0.21		$360		$120		$480
D	14. Install power wire 3#10 w/ #10 grd.	1620	FT	0.04	85	21.12			0.48		$1,800		$800		$2,600
D	15. Install power wire 3#12 w/ #12 grd.	1890	FT	0.04	81	21.12			0.36		$1,710		$700		$2,410
D	16. Install power wire 3#2 w/ #6 grd.	270	FT	0.08	25	21.12			1.66		$530		$460		$990
D	17. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	18. Install wire term. 600v, 1/c #12	50	EA	0.20	12	21.12			0.25		$250		$10		$260

000457

81113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	19. Install wire term. 600v, 1/c #10	48	EA	0.20	11	21.12			0.25		$230		$10		$240
D	20. Install wire term. 600v, 1/c #8	2	EA	0.40	1	21.12			1.00		$20				$20
D	19. Install wire term. 600v, 1/c #2	6	EA	0.50	4	21.12			2.45		$80		$20		$100
D	21. Install mtr. cont. kit, 600V, #14-#10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
D	13. Miscellaneous and support material	1	LOT	79.00	79	21.12					$1,670				$1,670
	Maint. & Warehouse Fac. HVAC 76														
D	1. Install 3/4" flex cond. w/ 2 conncectors	14	LOT	0.8	13	21.12			12.05		$270		$170		$440
D	3. Install starter & fused disc. switch	14	EA	2.50	41	21.12			150.00		$870		$2,150		$3,020
D	4. Install 3/4" conduit galv. rigid stl.	5200	FT	0.08	493	21.12			0.95		$10,410		$5,060		$15,470
D	6. Install 3/4" "L" ftg. w/cover & gasket	112	EA	1.00	133	21.12			9.90		$2,810		$1,140		$3,950
D	8. Install 3/4" conduit union "UNY"	45	EA	0.80	43	21.12			7.90		$910		$360		$1,270
D	10. Install 3/4" conduit seal "EYS"	15	EA	0.90	16	21.12			10.00		$340		$150		$490
D	12. Install 3/4" conduit hub	15	EA	0.80	14	21.12			4.40		$300		$70		$370
D	14. Install power wire 3#8 w/ #10 grd.	2730	FT	0.05	172	21.12			0.60		$3,630		$1,680		$5,310
D	15. Install power wire 3#12 w/ #12 grd.	2730	FT	0.04	117	21.12			0.36		$2,470		$1,010		$3,480
D	16. Install wire term. 600v, 1/c #12	56	EA	0.20	13	21.12			0.20		$270		$10		$280
D	17. Install wire term. 600v, 1/c #10	14	EA	0.20	3	21.12			0.25		$60				$60
D	18. Install wire term. 600v, 1/c #8	42	EA	0.25	12	21.12			0.90		$250		$40		$290
D	13. Miscellaneous and support material	1	LOT	107.00	107	21.12					$2,260				$2,260
	Misc. Fac. HVAC System 77														
D	1. Install 3/4" flex cond. w/ 2 conncectors	9	LOT	0.8	9	21.12			12.05		$190		$110		$300
D	3. Install starter & fused disc. switch	9	EA	2.50	27	21.12			150.00		$570		$1,380		$1,950
D	4. Install 3/4" conduit galv. rigid stl.	3600	FT	0.08	341	21.12			0.95		$7,200		$3,510		$10,710
D	6. Install 3/4" "L" ftg. w/cover & gasket	72	EA	1.00	85	21.12			9.90		$1,800		$730		$2,530
D	8. Install 3/4" conduit union "UNY"	29	EA	0.80	28	21.12			7.90		$590		$230		$820
D	10. Install 3/4" conduit seal "EYS"	10	EA	0.90	11	21.12			10.00		$230		$100		$330
D	12. Install 3/4" conduit hub	10	EA	0.80	9	21.12			4.40		$190		$50		$240
D	14. Install power wire 3#8 w/ #10 grd.	2520	FT	0.05	158	21.12			0.60		$3,340		$1,550		$4,890
D	15. Install power wire 3#12 w/ #12 grd.	1260	FT	0.04	54	21.12			0.36		$1,140		$460		$1,600
D	16. Install wire term. 600v, 1/c #12	24	EA	0.20	6	21.12			0.20		$130				$130
D	17. Install wire term. 600v, 1/c #10	10	EA	0.20	2	21.12			0.25		$40				$40
D	18. Install wire term. 600v, 1/c #8	36	EA	0.25	11	21.12			0.90		$230		$30		$260
D	13. Miscellaneous and support material	1	LOT	74.00	74	21.12					$1,560				$1,560

000458

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
.2	Maintenance Equipment 80														
D	Weld recept 480v,60A	1	EA	6.00	7	21.12			475.00		$150		$490		$640
D	Weld recept mtg assy	1	EA	3.00	4	21.12			33.00		$80		$30		$110
D	1. Install 3/4" flex cond. w/ 2 conncectors	4	LOT	0.8	4	21.12			12.00		$80		$50		$130
D	2. Install 1" flex cond. w/ 2 conncectors	2	LOT	1.1	3	21.12			18.50		$60		$40		$100
D	4. Install disconnt. switch,60a 3p, fused	2	EA	3.50	8	21.12			335.00		$170		$690		$860
D	5. Install 3/4" conduit galv. rigid stl.	1600	FT	0.08	152	21.12			0.95		$3,210		$1,560		$4,770
D	6. Install 1" conduit galv. rigid stl.	800	FT	0.11	104	21.12			1.44		$2,200		$1,180		$3,380
D	7. Install 1-1/2" conduit galv. rigid stl.	400	FT	0.14	66	21.12			2.30		$1,390		$940		$2,330
D	8. Install 3/4" "L" ftg. w/cover & gasket	32	EA	1.00	38	21.12			9.90		$800		$320		$1,120
D	9. Install 1" "L" ftg. w/cover & gasket	16	EA	1.00	19	21.12			14.50		$400		$240		$640
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	8	EA	2.00	19	21.12			27.00		$400		$220		$620
D	11. Install 3/4" conduit union "UNY"	12	EA	0.80	11	21.12			7.90		$230		$100		$330
D	12. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	13. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	14. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	15. Install 1" conduit seal "EYS"	2	EA	1.00	2	21.12			13.00		$40		$30		$70
D	16. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	17. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	18. Install 1" conduit hub	2	EA	1.00	2	21.12			5.20		$40		$10		$50
D	19. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	Install control wire 3#14	880	FT	0.03	28	21.12			0.21		$590		$190		$780
D	20. Install power wire 3#10 w/ #10 grd.	880	FT	0.04	46	21.12			0.48		$970		$430		$1,400
D	21. Install power wire 3#12 w/ #12 grd.	880	FT	0.04	38	21.12			0.36		$800		$320		$1,120
D	22. Install power wire 3#4 w/ #8 grd.	880	FT	0.07	71	21.12			1.15		$1,500		$1,040		$2,540
D	23. Install power wire 3#2 w/ #8 grd.	440	FT	0.08	40	21.12			1.66		$840		$750		$1,590
D	24. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	25. Install wire term. 600v, 1/c #12	16	EA	0.20	4	21.12			0.20		$80				$80
D	26. Install wire term. 600v, 1/c #10	4	EA	0.20	1	21.12			0.25		$20				$20
D	27. Install wire term. 600v, 1/c #8	6	EA	0.30	2	21.12			0.90		$40		$10		$50
D	28. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	29. Install wire term. 600v, 1/c #2	6	EA	0.50	4	21.12			2.45		$80		$20		$100
D	13. Miscellaneous and support material	1	LOT	72.00	85	21.12			1078.00		$1,800		$1,100		$2,900
D	4. Install disconnt. switch,30a 3p, fused	2	EA	2.50	6	21.12			150.00		$130		$310		$440

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81113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
.2	Remote Handling Equipment 82														
D	1. Install 3/4" flex cond. w/ 2 conncectors	8	LOT	0.8	8	21.12			12.00		$170		$100		$270
D	4. Install starter & fused disc. switch	5	EA	2.50	15	21.12			150.00		$320		$770		$1,090
D	Push button station	3	EA	2.30	8	21.12			120.00		$170		$370		$540
D	5. Install 3/4" conduit galv. rigid stl.	3200	FT	0.08	304	21.12			0.95		$6,420		$3,120		$9,540
D	8. Install 3/4" "L" ftg. w/cover & gasket	64	EA	1.00	76	21.12			9.90		$1,610		$650		$2,260
D	11. Install 3/4" conduit union "UNY"	26	EA	0.80	25	21.12			7.90		$530		$210		$740
D	14. Install 3/4" conduit seal "EYS"	9	EA	0.90	10	21.12			10.00		$210		$90		$300
D	17. Install 3/4" conduit hub	9	EA	0.80	9	21.12			4.40		$190		$40		$230
D	20. Install power wire 3#8 w/ #10 grd.	2100	FT	0.05	132	21.12			0.60		$2,790		$1,290		$4,080
D	21. Install power wire 3#12 w/ #12 grd.	420	FT	0.04	18	21.12			0.36		$380		$150		$530
D	22. Install power wire 3#10 w/ #10 grd.	420	FT	0.04	22	21.12			0.48		$460		$210		$670
D	25. Install wire term. 600v, 1/c #12	8	EA	0.20	2	21.12			0.20		$40				$40
D	26. Install wire term. 600v, 1/c #10	18	EA	0.20	4	21.12			0.20		$80				$80
D	27. Install wire term. 600v, 1/c #8	30	EA	0.30	11	21.12			0.85		$230		$30		$260
D	13. Miscellaneous and support material	1	LOT	65.00	77	21.12					$1,630				$1,630
	Radiation Shielding equipment 83														
D	1. Install 3/4" flex cond. w/ 2 conncectors	25	LOT	0.8	24	21.12			12.00		$510		$310		$820
D	2. Install starter & fused disc. switch	25	EA	2.50	74	21.12			150.00		$1,560		$3,840		$5,400
D	3. Install 3/4" conduit galv. rigid stl.	10500	FT	0.08	996	21.12			0.95		$21,040		$10,220		$31,260
D	4. Install 3/4" "L" ftg. w/cover & gasket	210	EA	1.00	249	21.12			9.90		$5,260		$2,130		$7,390
D	5. Install 3/4" conduit union "UNY"	100	EA	0.80	95	21.12			7.90		$2,010		$810		$2,820
D	6. Install 3/4" conduit seal "EYS"	28	EA	0.90	30	21.12			10.00		$630		$290		$920
D	7. Install 3/4" conduit hub	28	EA	0.80	27	21.12			4.40		$570		$130		$700
D	8. Install power wire 3#12 w/ #12 grd.	11400	FT	0.04	487	21.12			0.36		$10,290		$4,210		$14,500
D	9. Install wire term. 600v, 1/c #12	200	EA	0.20	47	21.12			0.25		$990		$50		$1,040
D	13. Miscellaneous and support material	1	LOT	211.00	211	21.12					$4,460				$4,460
	Sampling System 84														
D	1. Install 3/4" flex cond. w/ 2 conncectors	2	LOT	0.8	2	21.12			12.00		$40		$20		$60
D	2. Install starter & fused disc. switch	2	EA	2.50	6	21.12			150.00		$130		$310		$440
D	3. Install 3/4" conduit galv. rigid stl.	800	FT	0.08	76	21.12			0.95		$1,610		$780		$2,390
D	4. Install 3/4" "L" ftg. w/cover & gasket	16	EA	1.00	19	21.12			9.90		$400		$160		$560
D	5. Install 3/4" conduit union "UNY"	6	EA	0.80	6	21.12			7.90		$130		$50		$180
D	6. Install 3/4" conduit seal "EYS"	2	EA	0.90	2	21.12			10.00		$40		$20		$60

000460

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	7. Install 3/4" conduit hub	2	EA	0.80	5	21.12			4.40		$110		$10		$120
D	8. Install power wire 3#8 w/ #10 grd.	420	FT	0.05	26	21.12			0.60		$550		$260		$810
D	9. Install wire term. 600v, 1/c #10	10	EA	0.20	2	21.12			0.25		$40				$40
D	9. Install wire term. 600v, 1/c #8	6	EA	0.25	2	21.12			0.90		$40		$10		$50
D	13. Miscellaneous and support material	1	LOT	17.00	20	21.12					$420				$420
	CCTV Systems 85														
D	1. Install 3/4" conduit galv. rigid stl.	5200	FT	0.08	493	21.12			0.95		$10,410		$5,060		$15,470
D	2. Install 3/4" "L" ftg. w/cover & gasket	104	EA	1.00	123	21.12			9.90		$2,600		$1,060		$3,660
D	3. Install 3/4" conduit union "UNY"	58	EA	0.80	55	21.12			7.90		$1,160		$470		$1,630
D	4. Install 3/4" conduit seal "EYS"	58	EA	0.90	62	21.12			10.00		$1,310		$590		$1,900
D	5. Install 3/4" conduit hub	58	EA	0.80	55	21.12			4.40		$1,160		$260		$1,420
D	6. Install power wire 3#12 w/ #12 grd.	3000	FT	0.04	128	21.12			0.36		$2,700		$1,110		$3,810
D	Pan and tilt control wire 3#14	3000	FT	0.03	96	21.12			0.21		$2,030		$650		$2,680
D	Video co-axial cable	3000	FT	0.01	36	21.12			0.21		$760		$650		$1,410
D	7. Install wire term. 600v, 1/c #14	156	EA	0.20	37	21.12			0.20		$780		$30		$810
D	7. Install wire term. 600v, 1/c #12	208	EA	0.20	49	21.12			0.25		$1,030		$50		$1,080
D	9. Install wire term. 600v co-axial cable	52	EA	0.20	12	21.12			3.00		$250		$160		$410
D	13. Miscellaneous and support material	1	LOT	110.00	110	21.12					$2,320				$2,320
	Fire Detection & Alarm 92														
D	1. Install manual smoke detectors miscl. conduit fitting & wires	1	LOT	500.0	593	21.12			7000		$12,520		$7,180		$19,700
	Health Protection 93														
D	1. Install flex cond. assy. for monitors	29	EA	1.1	38	21.12			14.00		$800		$420		$1,220
D	2. Install stn. stl. box (20" x 20" x 6")	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" cond. galv. stl.	1450	FT	0.08	138	21.12			0.95		$2,910		$1,410		$4,320
D	4. Install 1" cond. galv. stl.	200	FT	0.11	26	21.12			1.44		$550		$300		$850
D	5. Install 1-1/2" cond. galv. stl.	170	FT	0.14	28	21.12			2.30		$590		$400		$990
D	6. Install 2" cond. galv. stl.	80	FT	0.17	16	21.12			3.08		$340		$250		$590
D	7. Install 3/4" "L" ftg. w/cover & gasket	47	EA	1.00	56	21.12			9.90		$1,180		$480		$1,660
D	8. Install 1" "L" ftg. w/cover & gasket	6	EA	1.20	9	21.12			14.50		$190		$90		$280
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	6	EA	2.00	14	21.12			27.00		$300		$170		$470
D	10. Install 2" "L" ftg. w/cover & gasket	4	EA	2.50	12	21.12			42.00		$250		$170		$420
D	11. Install 3/4" "T" ftg. w/cover & gasket	34	EA	1.20	48	21.12			11.30		$1,010		$390		$1,400
D	Install 2"- conduit seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140

000461

- 8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	12. Install 1" "T" ftg. w/cover & gasket	6	EA	1.50	12	21.12			16.60		$250		$100		$350
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	6	EA	2.50	18	21.12			30.30		$380		$190		$570
D	14. Install 2" "T" ftg. w/cover & gasket	4	EA	3.00	14	21.12			46.30		$300		$190		$490
D	15. Install 3/4" conduit union "UNY"	13	EA	0.80	12	21.12			7.90		$250		$110		$360
D	16. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	17. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	18. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	19. Install 1/2" conduit drain	21	EA	0.20	5	21.12			25		$110		$540		$650
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	3600	FT	0.02	77	21.12			0.23		$1,630		$850		$2,480
D	21. Install 1pr-#16 wire termination, 300v	58	EA	0.40	28	21.12			0.30		$590		$20		$610
D	13. Miscellaneous and support material	1	LOT	52.00	62	21.12					$1,310				$1,310
	Power Wiring to Monitors & CAM's														
D	3/4" Galv rigid cond.	1350	FT	0.08	128	21.12			0.95		$2,700		$1,310		$4,010
D	3/4" GRFX box	29	EA	2.20	76	21.12			32.90		$1,610		$980		$2,590
D	3/4" "L" ftg with cover and gasket	43	EA	1.00	51	21.12			9.90		$1,080		$440		$1,520
D	3/4" "T" ftg with cover and gasket	7	EA	1.20	10	21.12			11.30		$210		$80		$290
D	3/4" Conduit union "UNY"	17	EA	0.80	16	21.12			7.90		$340		$140		$480
D	3/4" Conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	3/4" Conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	Power wire 2#12 w/ #12 grd	1950	FT	0.03	62	21.12			0.27		$1,310		$540		$1,850
D	1/c #12 wite term	100	EA	0.20	24	21.12			0.25		$510		$30		$540
D	13. Miscellaneous and support material	1	LOT	32.00	38	21.12					$800				$800
	Distributed Control System 90														
D	1. Install 1-1/2" cond. galv. stl.	4000	FT	0.14	664	21.12			2.30		$14,020		$9,430		$23,450
D	2. Install 2" cond. galv. stl.	8500	FT	0.17	1713	21.12			3.08		$36,180		$26,830		$63,010
D	3. Install 1-1/2" "L" ftg. w/cover & gasket	120	FT	2.00	285	21.12			27.00		$6,020		$3,320		$9,340
D	4. Install 2" "L" ftg. w/ cover & gasket	255	FT	2.50	756	21.12			42.00		$15,970		$10,980		$26,950
D	5. Install 1-1/2" cond. union "UNY"	45	EA	1.50	80	21.12			26.70		$1,690		$1,230		$2,920
D	6. Install 2" cond. union "UNY"	95	EA	1.90	214	21.12			34.40		$4,520		$3,350		$7,870
D	7. Install 1-1/2" cond. seal "EYS"	8	EA	1.40	13	21.12			23.20		$270		$190		$460
D	8. Install 2" cond. seal "EYS"	17	EA	1.60	32	21.12			30.20		$680		$530		$1,210
D	9. Install 1-1/2" conduit hub	16	EA	1.50	28	21.12			7.90		$590		$130		$720
D	10. Install 2" conduit hub	34	EA	1.90	77	21.12			11.00		$1,630		$380		$2,010
D	11. Install power wire 600v,1/c #12	4160	FT	0.04	178	21.12			1.20		$3,760		$5,120		$8,880

000462

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	13. Install wire term. 600v, 1/c #12	1008	EA	0.40	478	21.12			0.30		$10,100		$310		$10,410
D	13. Install wire term. 600v, 1/c #12	8840	EA	0.06	576	21.12			2.10		$12,170		$19,030		$31,200
D	13. Miscellaneous and support material	1	LOT	516.00	516	21.12					$10,900				$10,900
	Radon Control System 20														
D	1. Install instrument flex cond. assy.	1	EA	1.10	1	21.12			14.00		$20		$10		$30
D	2. Install 3/4" cond. galv. stl.	100	FT	0.08	9	21.12			0.95		$190		$100		$290
D	3. Install 3/4" "L" ftg. w/ cover & gasket	4	EA	1.00	5	21.12			9.90		$110		$40		$150
D	4. Install 3/4" "T" ftg. w/ cover & gasket	1	EA	1.20	1	21.12			11.30		$20		$10		$30
D	5. Install 3/4" cond. hub	1	EA	0.80	1	21.12			4.40		$20				$20
D	6. Install 3/4" cond. union "EYS"	1	EA	0.90	1	21.12			10.00		$20		$10		$30
D	7. Install 3/4" cond. union "UNY"	1	EA	0.80	1	21.12			7.90		$20		$10		$30
D	8. Install 1/2" cond. drain	4	EA	0.20	1	21.12			25.00		$20		$100		$120
D	9. Install 1pr#16 str. cu/ pvcjkt., 300v	120	FT	0.02	3	21.12			0.23		$60		$30		$90
D	10. Install 1pr#16 wire termination, 300v	2	EA	0.40	1	21.12			0.30		$20				$20
	Product Recycle Sys. 26														
D	1. Install flex cond. assy. for monitors	24	EA	1.1	31	21.12			14.00		$650		$340		$990
D	2. Install stn. stl. box (20" x 20" x 6")	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" cond. galv. stl.	540	FT	0.08	51	21.12			0.95		$1,080		$530		$1,610
D	4. Install 1" cond. galv. stl.	130	FT	0.11	17	21.12			1.44		$360		$190		$550
D	5. Install 1-1/2" cond. galv. stl.	120	FT	0.14	20	21.12			2.30		$420		$280		$700
D	6. Install 2" cond. galv. stl.	50	FT	0.17	10	21.12			3.08		$210		$160		$370
D	7. Install 3/4" "L" ftg. w/cover & gasket	23	EA	1.00	27	21.12			9.90		$570		$230		$800
D	8. Install 1" "L" ftg. w/cover & gasket	5	EA	1.20	7	21.12			14.50		$150		$70		$220
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	5	EA	2.00	12	21.12			27.00		$250		$140		$390
D	10. Install 2" "L" ftg. w/cover & gasket	3	EA	2.50	9	21.12			42.00		$190		$130		$320
D	11. Install 3/4" "T" ftg. w/cover & gasket	26	EA	1.20	37	21.12			11.30		$780		$300		$1,080
D	12. Install 1" "T" ftg. w/cover & gasket	5	EA	1.50	9	21.12			16.60		$190		$90		$280
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	5	EA	2.50	15	21.12			30.30		$320		$160		$480
D	14. Install 2" "T" ftg. w/cover & gasket	5	EA	3.00	18	21.12			46.30		$380		$240		$620
D	15. Install 3/4" conduit union "UNY"	9	EA	0.80	9	21.12			7.90		$190		$70		$260
D	16. Install 1" conduit union "UNY"	2	EA	1.00	2	21.12			13.40		$40		$30		$70
D	17. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	18. Install 2" conduit union "UNY"	4	EA	1.90	9	21.12			34.40		$190		$140		$330

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	19. Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	20. Install 2" cond. seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	21. Install 1/2" cond. drain	18	EA	0.20	4	21.12			25.00		$80		$460		$540
D	22. Install 1pr#16 str. cu/ pvcjkt., 300v	2700	FT	0.02	58	21.12			0.23		$1,220		$640		$1,860
D	21. Install 1pr#16 wire termination, 300v	48	EA	0.40	23	21.12			0.30		$490		$10		$500
D	22. Miscellaneous and support material	1	LOT	29.00	34	21.12					$720				$720
	Cold Chemical Sys. 43														
D	1. Install flex cond. assy. for monitors	38	EA	1.1	50	21.12			14.00		$1,060		$550		$1,610
D	2. Install stn. stl. box (20" x 20" x 6")	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" cond. galv. stl.	820	FT	0.08	78	21.12			0.95		$1,650		$800		$2,450
D	4. Install 1" cond. galv. stl.	190	FT	0.11	25	21.12			1.44		$530		$280		$810
D	5. Install 1-1/2" cond. galv. stl.	170	FT	0.14	28	21.12			2.30		$590		$400		$990
D	6. Install 2" cond. galv. stl.	90	FT	0.17	18	21.12			3.08		$380		$280		$660
D	7. Install 3/4" "L" ftg. w/cover & gasket	36	EA	1.00	43	21.12			9.90		$910		$370		$1,280
D	8. Install 1" "L" ftg. w/cover & gasket	8	EA	1.20	11	21.12			14.50		$230		$120		$350
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	8	EA	2.00	19	21.12			27.00		$400		$220		$620
D	10. Install 2" "L" ftg. w/cover & gasket	4	EA	2.50	12	21.12			42.00		$250		$170		$420
D	11. Install 3/4" "T" ftg. w/cover & gasket	40	EA	1.20	57	21.12			11.30		$1,200		$460		$1,660
D	12. Install 1" "T" ftg. w/cover & gasket	8	EA	1.50	14	21.12			16.60		$300		$140		$440
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	8	EA	2.50	24	21.12			30.30		$510		$250		$760
D	14. Install 2" "T" ftg. w/cover & gasket	8	EA	3.00	28	21.12			46.30		$590		$380		$970
D	15. Install 3/4" conduit union "UNY"	14	EA	0.80	13	21.12			7.90		$270		$110		$380
D	16. Install 1" conduit union "UNY"	3	EA	1.00	4	21.12			13.40		$80		$40		$120
D	17. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	18. Install 2" conduit union "UNY"	7	EA	1.90	16	21.12			34.40		$340		$250		$590
D	19. Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	20. Install 2" cond. seal "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	21. Install 1/2" cond. drain	28	EA	0.20	7	21.12			25.00		$150		$720		$870
D	22. Install 1pr#16 str. cu/ pvcjkt., 300v	4050	FT	0.02	86	21.12			0.23		$1,820		$950		$2,770
D	21. Install 1pr#16 wire termination, 300v	76	EA	0.40	36	21.12			0.30		$760		$20		$780
D	22. Miscellaneous and support material	1	LOT	44.00	52	21.12					$1,100				$1,100

000464

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Cold Chemical Sys. 44														
D	1. Install flex cond. assy. for monitors	81	EA	1.1	106	21.12			14.00		$2,240		$1,160		$3,400
D	2. Install stn. stl. box (20" x 20" x 6")	3	EA	10.3	37	21.12			630.00		$780		$1,940		$2,720
D	3. Install 3/4" cond. galv. stl.	1700	FT	0.08	161	21.12			0.95		$3,400		$1,660		$5,060
D	4. Install 1" cond. galv. stl.	400	FT	0.11	52	21.12			1.44		$1,100		$590		$1,690
D	5. Install 1-1/2" cond. galv. stl.	360	FT	0.14	60	21.12			2.30		$1,270		$850		$2,120
D	6. Install 2" cond. galv. stl.	190	FT	0.17	38	21.12			3.08		$800		$600		$1,400
D	7. Install 3/4" "L" ftg. w/cover & gasket	75	EA	1.00	89	21.12			9.90		$1,880		$760		$2,640
D	8. Install 1" "L" ftg. w/cover & gasket	15	EA	1.20	21	21.12			14.50		$440		$220		$660
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	15	EA	2.00	36	21.12			27.00		$760		$420		$1,180
D	10. Install 2" "L" ftg. w/cover & gasket	8	EA	2.50	24	21.12			42.00		$510		$340		$850
D	11. Install 3/4" "T" ftg. w/cover & gasket	82	EA	1.20	117	21.12			11.30		$2,470		$950		$3,420
D	12. Install 1" "T" ftg. w/cover & gasket	15	EA	1.50	27	21.12			16.60		$570		$260		$830
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	15	EA	2.50	44	21.12			30.30		$930		$470		$1,400
D	14. Install 2" "T" ftg. w/cover & gasket	16	EA	3.00	57	21.12			46.30		$1,200		$760		$1,960
D	15. Install 3/4" conduit union "UNY"	29	EA	0.80	28	21.12			7.90		$590		$230		$820
D	16. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	17. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	18. Install 2" conduit union "UNY"	5	EA	1.90	11	21.12			34.40		$230		$180		$410
D	19. Install 2" conduit hub	3	EA	1.90	7	21.12			11.00		$150		$30		$180
D	20. Install 2" cond. seal "EYS"	3	EA	1.60	6	21.12			30.20		$130		$90		$220
D	21. Install 1/2" cond. drain	59	EA	0.20	14	21.12			25.00		$300		$1,510		$1,810
D	22. Install 1pr#16 str. cu/ pvcjkt., 300v	8500	FT	0.02	181	21.12			0.23		$3,820		$2,000		$5,820
D	21. Install 1pr#16 wire termination, 300v	162	EA	0.40	77	21.12			0.30		$1,630		$50		$1,680
D	22. Miscellaneous and support material	1	LOT	90.00	90	21.12					$1,900				$1,900
	Processor System 17														
D	1. Install 1" "L" ftg. w/ cover & gasket	6	EA	1.2	9	21.12			14.50		$190		$90		$280
D	2. Install 1-1/2" "L" ftg. w/ cover & gasket	6	EA	2.0	14	21.12			27.00		$300		$170		$470
D	3. Install 2" "L" ftg. w/ cover & gasket	3	EA	2.50	9	21.12			42.00		$190		$130		$320
D	4. Install 1-1/2" "T" ftg. w/cover & gasket	6	EA	2.50	18	21.12			30.30		$380		$190		$570
D	5. Install 2" "T" ftg. w/cover & gasket	6	EA	3.00	21	21.12			46.30		$440		$280		$720
D	6. Install 3/4" cond. union "UNY"	10	EA	0.80	9	21.12			7.90		$190		$80		$270
D	7. Install 1" cond. union "UNY"	2	EA	1.00	2	21.12			13.40		$40		$30		$70
D	8. Install 1-1/2" cond. union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130

000465

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Radioactive Liquid Waste Sys. 62														
D	1. Install flex cond. assy. for monitors	102	EA	1.1	133	21.12			14.00		$2,810		$1,460		$4,270
D	2. Install stn. stl. box (20" x 20" x 6")	4	EA	10.3	49	21.12			630.00		$1,030		$2,580		$3,610
D	3. Install 3/4" cond. galv. stl.	2200	FT	0.08	209	21.12			0.95		$4,410		$2,140		$6,550
D	4. Install 1" cond. galv. stl.	520	FT	0.11	68	21.12			1.44		$1,440		$770		$2,210
D	5. Install 1-1/2" cond. galv. stl.	470	FT	0.14	78	21.12			2.30		$1,650		$1,110		$2,760
D	6. Install 2" cond. galv. stl.	240	FT	0.17	48	21.12			3.08		$1,010		$760		$1,770
D	7. Install 3/4" "L" ftg. w/cover & gasket	97	EA	1.00	115	21.12			9.90		$2,430		$980		$3,410
D	8. Install 1" "L" ftg. w/cover & gasket	20	EA	1.20	28	21.12			14.50		$590		$300		$890
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	20	EA	2.00	47	21.12			27.00		$990		$550		$1,540
D	10. Install 2" "L" ftg. w/cover & gasket	11	EA	2.50	33	21.12			42.00		$700		$470		$1,170
D	11. Install 3/4" "T" ftg. w/cover & gasket	106	EA	1.20	151	21.12			11.30		$3,190		$1,230		$4,420
D	12. Install 1" "T" ftg. w/cover & gasket	20	EA	1.50	36	21.12			16.60		$760		$340		$1,100
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	20	EA	2.50	59	21.12			30.30		$1,250		$620		$1,870
D	14. Install 2" "T" ftg. w/cover & gasket	21	EA	3.00	75	21.12			46.30		$1,580		$1,000		$2,580
D	15. Install 3/4" conduit union "UNY"	38	EA	0.80	36	21.12			7.90		$760		$310		$1,070
D	16. Install 1" conduit union "UNY"	8	EA	1.00	9	21.12			13.40		$190		$110		$300
D	17. Install 1-1/2" conduit union "UNY"	8	EA	1.50	14	21.12			26.70		$300		$220		$520
D	18. Install 2" conduit union "UNY"	6	EA	1.90	14	21.12			34.40		$300		$210		$510
D	19. Install 2" conduit hub	4	EA	1.90	9	21.12			11.00		$190		$50		$240
D	20. Install 2" cond. seal "EYS"	4	EA	1.60	8	21.12			30.20		$170		$120		$290
D	21. Install 1/2" cond. drain	74	EA	0.20	18	21.12			25.00		$380		$1,900		$2,280
D	22. Install 1pr#16 str. cu/ pvcjkt., 300v	10900	FT	0.02	233	21.12			0.23		$4,920		$2,570		$7,490
D	21. Install 1pr#16 wire termination, 300v	204	EA	0.40	97	21.12			0.30		$2,050		$60		$2,110
D	22. Miscellaneous and support material	1	LOT	117.00	117	21.12					$2,470				$2,470
	Product Handling Bldg. HVAC System 73														
D	1. Install mtr. flex cond. assy. 50hp	2	EA	15.9	38	21.12			247.00		$800		$510		$1,310
D	2. Install discnt. switch 600a, 600v, 3ph	2	EA	13.3	32	21.12			1800.00		$680		$3,690		$4,370
D	3. Install discnt. switch 1200a,600v,3ph	2	EA	20.00	47	21.12			5100.00		$990		$10,460		$11,450
D	4. Install 1" galv. rigid stl. cond.	2800	FT	0.11	365	21.12			1.44		$7,710		$4,130		$11,840
D	5. Install 2" galv. rigid stl. cond.	2800	FT	0.17	564	21.12			3.08		$11,910		$8,840		$20,750
D	6. Install 1" "L" ftg. w/cover & gasket	56	EA	1.20	80	21.12			14.50		$1,690		$830		$2,520
D	7. Install 2" "LBD" ftg. w/cover & gasket	56	EA	2.50	166	21.12			54.00		$3,510		$3,100		$6,610
D	8. Install 1" cond. union "UNY"	21	EA	1.00	25	21.12			13.40		$530		$290		$820

000466

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	9. Install 2" conduit union "UNY"	21	EA	1.90	47	21.12			34.40		$990		$740		$1,730
D	10. Install 1" cond. seal "EYS"	7	EA	1.00	8	21.12			13.00		$170		$90		$260
D	11. Install 2" cond. seal "EYS"	7	EA	1.60	13	21.12			30.20		$270		$220		$490
D	12. Install 1" conduit hub	7	EA	1.00	8	21.12			5.20		$170		$40		$210
D	13. Install 2" conduit hub	7	EA	1.90	16	21.12			11.00		$340		$80		$420
D	14. Install power wire 3#4w/#8grd	840	FT	0.07	68	21.12			1.15		$1,440		$990		$2,430
D	15. Install power wire 3#4/0 w/#2 grd	2940	FT	0.15	512	21.12			5.33		$10,810		$16,060		$26,870
D	16. Install 1/c#1/0 wire termination, 300v	12	EA	0.70	10	21.12			2.75		$210		$30		$240
D	17. Install 1/c#350kcm wire termination, 300	36	EA	1.50	64	21.12			6.20		$1,350		$230		$1,580
D	18. Install mtr. term. kit #14-#10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
D	19. Miscellaneous and support material	1	LOT	75.00	75	21.12					$1,580				$1,580
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		59,410	$21.08					1,252,100		1,109,700	645,800	$3,007,600

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CONTRACTOR

DETAIL ESTIM... WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Instrumentation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	SYSTEM 15														
D	1. Install Feed Preparation sys.	1	LOT	1215.0	1441	21.12			109592		$30,430		$112,330		$142,760
	SYSTEM 17														
D	1. Install Processor sys.	1	LOT	140.0	166	21.12			15451		$3,510		$15,840		$19,350
	SYSTEM 26														
D	1. Install Process Offgas	1	LOT	172.0	204	21.12			17257		$4,310		$17,690		$22,000
	SYSTEM 43														
D	1. Install Radon Control Sys.	1	LOT	407.0	483	21.12			46636		$10,200		$47,800		$58,000
	SYSTEM 44														
D	1. Install Product Additive Sys.	1	LOT	375.0	445	21.12			24363		$9,400		$24,970		$34,370
	SYSTEM 62														
D	1. Install Waste Water Treatment Sys.	1	LOT	933.0	1106	21.12			94194		$23,360		$96,550		$119,910
D	Install HVAC controls	35	EA	8.0	332	21.12			940		$7,010		$33,720		$40,730
	SYSTEM 90														
D	1. Install distrib. control sys.	1	LOT	225.0	267	21.12			282000		$5,640		$289,050		$294,690
D	2. Install control software	1	LOT						126500				$129,660		$129,660
	SYSTEM 92														
D	1. Install fire alarm & evaculation sys.	1	LOT	150.0	178	21.12			30000		$3,760		$30,750		$34,510
	SYSTEM 93														
D	1. Install real time SOx monitor	1	EA	12.0	14	21.12			12650		$300		$12,970		$13,270
D	2. Install hps control station	1	EA	18.0	21	21.12			27000		$440		$27,680		$28,120
D	3. Install auto radio counter	2	EA	24.0	57	21.12			35725		$1,200		$73,240		$74,440
D	4. Install radonn wkg. level monitor	8	EA	12.0	114	21.12			11000		$2,410		$90,200		$92,610
D	5. Install body frisker	3	EA	20.0	71	21.12			41950		$1,500		$129,000		$130,500
D	6. Install air sampling station (CAM)	12	EA	4.0	57	21.12			1900		$1,200		$23,370		$24,570
D	7. Install tool comtamination monitor	2	EA	20.0	47	21.12			19000		$990		$38,950		$39,940
D	8. Install isokinetic air sampler	2	EA	60.0	142	21.12			30000		$3,000		$61,500		$64,500
D	1. Install leak detection	14	EA	21.5	357	21.12			901.5		$7,540		$12,940		$20,480
D	2. Install isokhetic monitor	1	EA	60.0	71	21.12			150000		$1,500		$153,750		$155,250
D	3. Install instruments and bulk mat'l	1	LOT	300.0	356	21.12			9555		$7,520		$9,790		$17,310
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		5,929	$21.12					125,200		1,431,800		$1,557,000

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	800 - Paint / Insulation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	1. Paint steel	125240	SF	0.02	2227	22.18			0.11		$49,390		$14,120		$63,510
D	2. Paint gyp board	24570	SF	0.01	350	22.18			0.09		$7,760		$2,270		$10,030
D	3. Paint single doors	59	EA	2.7	189	22.18			5.85		$4,190		$350		$4,540
D	4. Paint double door	20	EA	5.4	128	22.18			11.7		$2,840		$240		$3,080
D	5. Coat masonry	115040	SF	0.02	2728	22.18			0.39		$60,510		$45,990		$106,500
D	7. Paint bulk	1	LOT	1560	1850	22.18			8654		$41,030		$8,870		$49,900
D	1. Insulation bulk	1	LOT	2795	3314	22.18			40384		$73,500		$41,390		$114,890
D	Paint equipment	16050	SF	0.015	285	22.18			0.11		$6,320		$1,810		$8,130
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		11,07.1	$22.18					246,500		115,000		$360,500

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CONTRACTOR

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	AAA - Mobilization	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	ALIGNMENT & PROJECT MEETINGS														
	(5) MEETINGS, 2 DAYS EACH for (7) People														
	TRAVEL - AIR FARE	35.0	TRIPS					$1,000.00				$35,000			$35,000
	CAR RENTAL - (2) CARS PER TRIP @ (2) DAYS EA	20.0	DAYS					$50.00				$1,000			$1,000
	GASOLINE - 200 mi./TRIP/CAR	2,000.0	MI					$1.45				$2,900			$2,900
	CAR LEASING - (2) CARS	2.0	CARS					$12,000				$24,000			$24,000
	PER DIEM -	70.0	PD					$96.00				$6,720			$6,720
	LABOR @ 8 HRS /DAY	560.0	MH	1.0	560	$75.00					$42,000				$42,000
	RELOCATION														
	HOUSEHOLD MOVE & TRAVEL FY98 REPLAN	10	PEOPLE					$45,000				$450,000			$450,000
	EXPENSE FY98 REPLAN	10	PEOPLE					$15,000				$150,000			$150,000
	TOTAL COST for ALIGNMENT	1	LS								$42,000	$669,620			$711,620
	HEALTH & SAFETY PLAN - PRE OPERATIONAL														
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	TOTAL - HEALTH $ SAFETY	1	LS		240						$18,000				$18,000
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		800	$75.00					60,000	669,600			$729,600

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COST IMPAC .ATRIX SHEET

Estimate No.: C4981005
Project: Silos 1 & 2 Cement Stabilization(FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 20-Oct-99
Estimator: J. ELLIS
Location: Fernald

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Civil & Excav. All Facilities		Civil & Excav. All Facilities		Civil & Excav. All Facilities		Concrete All Facilities		Concrete All Facilities		Cement Stabiliz.	
$41,168,310	Labor		Material		Equipment		Labor		Material		PPE (Material)	
Cost	Base $	$504,920	Base $	$144,860	Base $	$13,590	Base $	$5,090,680	Base $	$1,822,930	Base $	$73,680
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			0%	0%	-1%	10%				
Material Pricing			-1%	10%	-1%	10%			-1%	10%	-1%	15%
Contamination	-1%	10%					-1%	10%				
Technology												
Regulations/Laws												
Quantity Variation	-1%	10%	-1%	15%	0%	15%	-1%	10%	0%	10%	-1%	10%
Project Definition	-1%	10%					0%	5%				
Other												
Range - %	-4%	40%	-2%	25%	-1%	25%	-3%	35%	-1%	20%	-2%	25%
Range - $	$484,723	$706,888	$141,963	$181,076	$13,454	$16,988	$4,937,960	$6,872,418	$1,804,701	$2,187,616	$72,206	$92,100
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Structual Steel - All Facilities		Structual Steel - All Facilities		Arch./Build's/Finishes - All Fac.		Arch./Build's/Finishes - All Fac.		Equipment System 1-94		Equipment System 1-94	
	Labor		Material		Labor		Material		Labor		Equipment	
Cost	Base $	$927,220	Base $	$1,353,980	Base $	$1,847,670	Base $	$1,955,350	Base $	$1,391,690	Base $	$14,876,320
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	15%			-1%	15%			-1%	20%		
Material Pricing			-1%	10%			0%	10%			-1%	20%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation			0%	10%			-1%	10%			-1%	10%
Project Definition	-1%	10%			-1%	15%			-1%	15%	-1%	10%
Other												
Range - %	-2%	25%	-1%	20%	-2%	30%	-1%	20%	-2%	35%	-3%	40%
Range - $	$908,676	$1,159,025	$1,340,440	$1,624,776	$1,810,717	$2,401,971	$1,935,797	$2,346,420	$1,363,856	$1,878,782	$14,430,030	$20,826,848
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

Analyst: _____

Client: _____

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COST IMPAC .ATRIX SHEET

Estimate No.: C4981005
Project: Silos 1 & 2 Cement Stabilization(FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 20-Oct-99
Estimator: J. ELLIS
Location: Fernald

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Cement Stabiliz. Piping Labor		Cement Stabiliz. Piping Material		Cement Stabiliz. Instrumentation Labor		Cement Stabiliz. Instrumentation Material		Cement Stabiliz. Electrical Labor		Cement Stabiliz. Electrical Material	
Cost	Base $	$926,220	Base $	$563,270	Base $	$313,580	Base $	$2,012,700	Base $	$3,163,110	Base $	$1,559,920
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			-1%	10%			-1%	10%		
Material Pricing			-1%	15%			0%	15%			-1%	15%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	5%	0%	10%			0%	5%			0%	10%
Project Definition	0%	5%			0%	5%	0%	5%	0%	10%		
Other												
Range - %	-1%	20%	-1%	25%	-1%	15%	0%	25%	-1%	20%	-1%	25%
Range - $	$916,958	$1,111,464	$557,637	$704,088	$310,444	$360,617	$2,012,700	$2,515,875	$3,131,479	$3,795,732	$1,544,321	$1,949,900
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Cement Stabiliz. Electrical Equipment		Cement Stabiliz. Paint/Insulation Labor		Cement Stabiliz. Paint/Insulation Material		Mobilization Labor		Mobilization S/C			
Cost	Base $	$893,160	Base $	$614,890	Base $	$161,660	Base $	$150,280	Base $	$806,630	Base $	$0
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			0%	10%			-1%	10%				
Material Pricing	-1%	20%			-1%	10%			-1%	10%		
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	-1%	10%			0%	5%			0%	5%		
Project Definition	-1%	10%	0%	5%			0%	10%				
Other												
Range - %	-3%	40%	0%	15%	-1%	15%	-1%	20%	-1%	15%	0%	0%
Range - $	$866,365	$1,250,424	$614,890	$707,124	$160,043	$185,909	$148,777	$180,336	$798,564	$927,625	$0	$0
Distribution	Uniform		U		U		U		U			
Correlation Rank												

Analyst: _____

Client: _____

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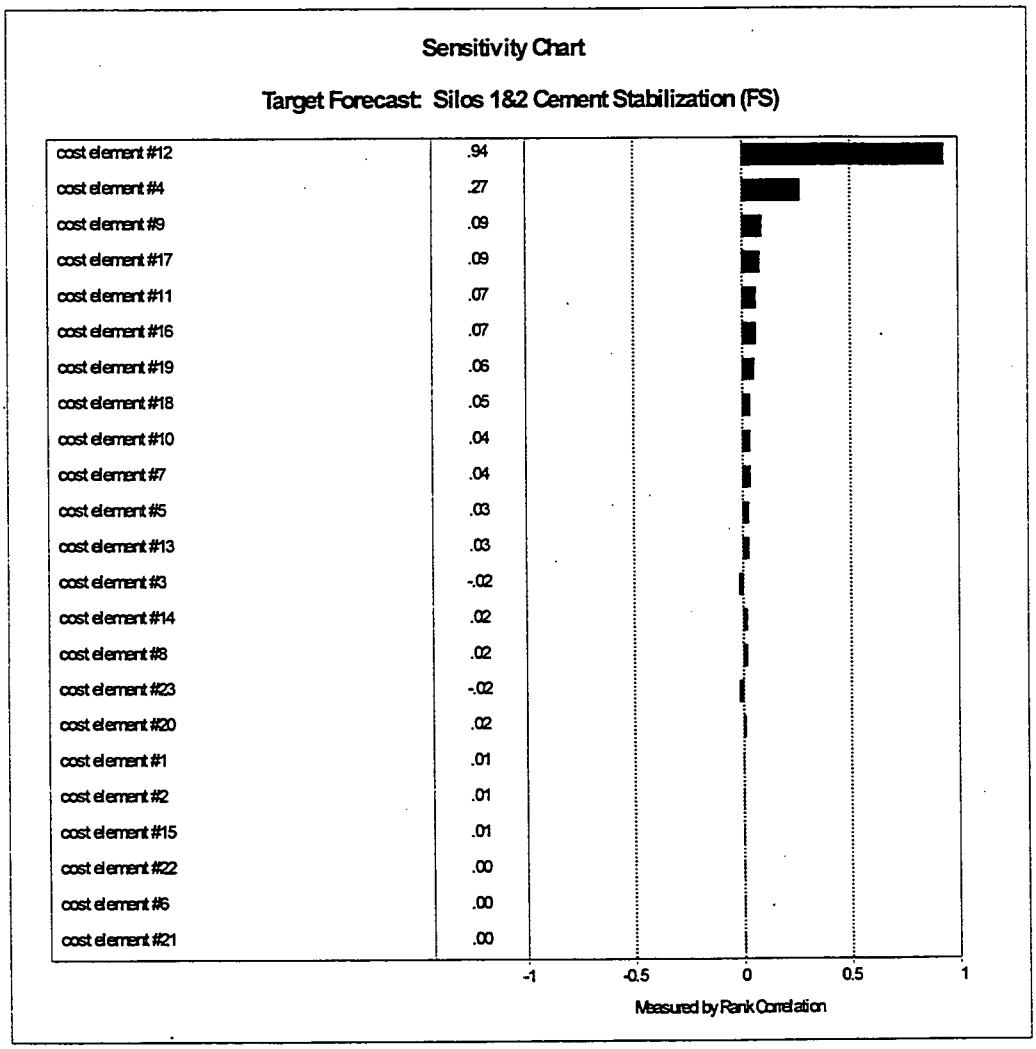
Crystal Ball Report

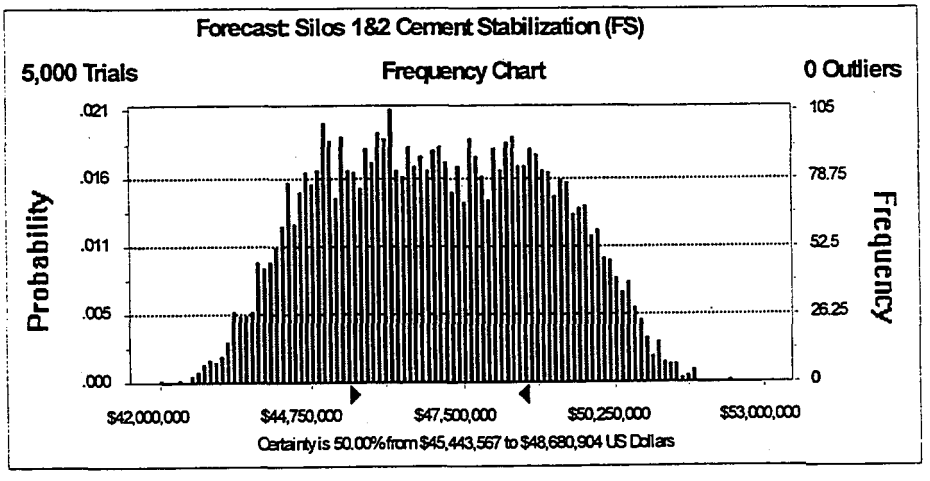


Forecast: Silos 1&2 Cement Stabilization (FS) **Cell: C52**

Summary:

Certainty Level is 50.00%
Certainty Range is from $45,443,567 to $48,680,904 US Dollars
Display Range is from $42,000,000 to $53,000,000 US Dollars
Entire Range is from $42,080,881 to $52,380,602 US Dollars
After 5,000 Trials, the Std. Error of the Mean is $27,980

Statistics:	Value
Trials	5000
Mean	$47,067,284
Median	$47,031,048
Mode	---
Standard Deviation	$1,978,482
Variance	4E+12
Skewness	0.04
Kurtosis	2.08
Coeff. of Variability	0.04
Range Minimum	$42,080,881
Range Maximum	$52,380,602
Range Width	$10,299,720
Mean Std. Error	$27,979.96



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Forecast: Silos 1&2 Cement Stabilization (FS) (cont'd) **Cell: C52**

Percentiles:

Percentile			US Dollars
0.0%			$42,080,881
2.5%			$43,593,186
5.0%			$43,959,383
50.0%	Risk Budget	14.2%	$47,031,048
95.0%			$50,223,099
97.5%			$50,606,298
100.0%			$52,380,602

End of Forecast

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RISK ANALYSIS INPUT DATA TABLE

Silos 1&2 Cement Stabilization (FS) Estimate No.:C4981005 8113

Item No.	Cost Element Description	Estimated Base $	Distribution Range Width Low %	Low $	High %	High $	Dist. Type	Corr. Rank
01	cost element #1	$504,920	-4%	$484,723	40%	$706,888	U	-
02	cost element #2	$144,860	-2%	$141,963	25%	$181,075	U	-
03	cost element #3	$13,590	-1%	$13,454	25%	$16,988	U	-
04	cost element #4	$5,090,680	-3%	$4,937,960	35%	$6,872,418	U	-
05	cost element #5	$1,822,930	-1%	$1,804,701	20%	$2,187,516	U	-
06	cost element #6	$73,680	-2%	$72,206	25%	$92,100	U	-
07	cost element #7	$927,220	-2%	$908,676	25%	$1,159,025	U	-
08	cost element #8	$1,353,980	-1%	$1,340,440	20%	$1,624,776	U	-
09	cost element #9	$1,847,670	-2%	$1,810,717	30%	$2,401,971	U	-
10	cost element #10	$1,955,350	-1%	$1,935,797	20%	$2,346,420	U	-
11	cost element #11	$1,391,690	-2%	$1,363,856	35%	$1,878,782	U	-
12	cost element #12	$14,876,320	-3%	$14,430,030	40%	$20,826,848	U	-
13	cost element #13	$926,220	-1%	$916,958	20%	$1,111,464	U	-
14	cost element #14	$563,270	-1%	$557,637	25%	$704,088	U	-
15	cost element #15	$313,580	-1%	$310,444	15%	$360,617	U	-
16	cost element #16	$2,012,700	0%	$2,012,700	25%	$2,515,875	U	-
17	cost element #17	$3,163,110	-1%	$3,131,479	20%	$3,795,732	U	-
18	cost element #18	$1,559,920	-1%	$1,544,321	25%	$1,949,900	U	-
19	cost element #19	$893,160	-3%	$866,365	40%	$1,250,424	U	-
20	cost element #20	$614,890	0%	$614,890	15%	$707,124	U	-
21	cost element #21	$161,660	-1%	$160,043	15%	$185,909	U	-
22	cost element #22	$150,280	-1%	$148,777	20%	$180,336	U	-
23	cost element #23	$806,630	-1%	$798,564	15%	$927,625	U	-
24				$0		$0		
25				$0		$0		
26				$0		$0		
27				$0		$0		
28				$0		$0		
29				$0		$0		
30				$0		$0		
31				$0		$0		
32				$0		$0		
33				$0		$0		
34				$0		$0		
35				$0		$0		
36				$0		$0		
37				$0		$0		
38				$0		$0		
39				$0		$0		
40				$0		$0		
41				$0		$0		
42				$0		$0		
43				$0		$0		
44				$0		$0		
45				$0		$0		
Total	Silos 1&2 Cement Stabilization (FS)	$41,168,310		$40,306,701		$53,983,899		

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C.4.3 Engineering Cost Estimate

C.4.3.1 Cost Summary

Engineering cost is the cost of design (preliminary design, detailed design and supporting documentation, and construction field support); it is calculated as an estimated FTE by discipline. The engineering rate of $70.00/mhr is based on a subcontract A/E firm performing the engineering activities.

The engineering cost for the Chemical Stabilization — Other facility design and labor support is summarized in **Table C.4.3-1**.

TABLE C. 4.3-1
ENGINEERING COST SUMMARY FOR CHEMICAL STABILIZATION — CEMENT-BASED

Engineering mhr	340,127
Engineering Labor Rate ($1/mhr)	$70
Estimated Engineering Cost	$23,808,860

C.4.3.2 Attachment

The engineering cost estimate summary by discipline for the CHEM1 alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.4.3.I

Engineering Cost Estimate Summary for

Chemical Stabilization — Cement-based

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
·4	Conceptual Design Phase @ 25 wks duration														
	Process Engineer	6	EA	998.4	5990	70.00					$419,330				$419,330
	Mechanical Engineer	4	EA	998.4	3994	70.00					$279,550				$279,550
	Electrical Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Piping Engineer	6	EA	998.4	5990	70.00					$419,330				$419,330
	I & C Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Structural Engineer		EA	998.4		70.00									
	Civil Engineer		EA	998.4		70.00									
	HVAC Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Cost/ Scheduler	3	EA	998.4	2995	70.00					$209,660				$209,660
	Operations Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Clerical Administration	1	EA	998.4	998	16.50					$16,470				$16,470
	Construction Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	TOTAL for Conceptual Design	1	LS		26957						1833570				$1,833,570
	Preliminary Design Phase @ 42 wks duration														
	Process Engineer	10	EA	1685.0	16850	70.00					$1,179,500				$1,179,500
	Mechanical Engineer	8	EA	1685.0	13480	70.00					$943,600				$943,600
	Electrical Engineer	3	EA	1685.0	5055	70.00					$353,850				$353,850
	Piping Engineer	8	EA	1685.0	13480	70.00					$943,600				$943,600
	I & C Engineer	4	EA	1685.0	6740	70.00					$471,800				$471,800
	Structural Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Civil Engineer	1.5	EA	1685.0	2528	70.00					$176,930				$176,930
	HVAC Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Cost/ Scheduler	6	EA	1685.0	10110	70.00					$707,700				$707,700
	Operations Manager	1	EA	1685.0	1685	70.00					$117,950				$117,950
	Project Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Project Manager	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Clerical Administration	3	EA	1685.0	5055	16.50					$83,410				$83,410
	Construction Engineer	1	EA	1685.0	1685	70.00					$117,950				$117,950
	TOTAL for Preliminary Design	1	LS		90148						6039890				$6,039,890

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DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
4	Final Design Phase @ 52 wks duration														
	Process Engineer	6	EA	2080.0	12480	70.00					$873,600				$873,600
	Mechanical Engineer	10	EA	2080.0	20800	70.00					$1,456,000				$1,456,000
	Electrical Engineer	6	EA	2080.0	12480	70.00					$873,600				$873,600
	Piping Engineer	10	EA	2080.0	20800	70.00					$1,456,000				$1,456,000
	I & C Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Structural Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Civil Engineer	2	EA	2080.0	4160	70.00					$291,200				$291,200
	HVAC Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Cost/ Scheduler	8	EA	2080.0	16640	70.00					$1,164,800				$1,164,800
	Operations Manager	2	EA	2080.0	4160	70.00					$291,200				$291,200
	Project Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Project Manager	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Clerical Administration	5	EA	2080.0	10400	16.50					$171,600				$171,600
	Construction Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	TOTAL for Final Design	1	LS		*********						9490000				$9,490,000
	Construction Design Phase @ 134 wks duration														
	Process Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Mechanical Engineer	4	EA	5360.0	21440	70.00					$1,500,800				$1,500,800
	Electrical Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Piping Engineer	2	EA	5360.0	10720	70.00					$750,400				$750,400
	I & C Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Structural Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Civil Engineer		EA	5360.0		70.00									
	HVAC Engineer		EA	5360.0		70.00									
	Cost/ Scheduler	3	EA	5360.0	16080	70.00					$1,125,600				$1,125,600
	Operations Manager		EA	5360.0		70.00									
	Project Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Project Manager	2	EA	5360.0	10720	70.00					$750,400				$750,400
	Clerical Administration	5	EA	5360.0	26800	16.50					$442,200				$442,200
	TOTAL for Construction	1	LS		*********						6445400				$6,445,400
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		373,184	$63.80					23,808,860				$23,808,860

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C.4.4 Operation and Maintenance Estimate Basis: Chemical Stabilization — Cement-based

C.4.4.1 Introduction

The O&M costs for the Chemical Stabilization — Cement-based (CHEM1) alternative are summarized in **Table C.4.4-1**.

The O&M costs were prepared as detailed estimates based on the **Basis of Design and Description (Appendix G)**, POP testing data (**Appendix H**), and O&M experience at the FEMP.

TABLE C. 4.4-1
OPERATION AND MAINTENANCE COST ESTIMATE FOR CHEMICAL STABILIZATION —CEMENT-BASED

FDF Labor Costs	
FDF O&M Labor Cost	$34,817,950
FDF Start-up Labor Cost	$5,802,990
Material Costs	
Spare Parts Cost	$1,059,690
Consumable (PPE and Supplies) Cost	$2,956,500
Contractor Technical Support Costs	
Contractor Operation Support Cost	$2,208,960
Contractor Start-up Support Cost	$1,154,320
Other Costs	
Secondary Waste	$698,844
Utilities Cost	$3,251,030
Risk Budget	$24,857,010
Total O&M Cost	$76,807,294

C.4.4.2 Estimate Basis

The cost estimate basis for the O&M cost for the Chemical Stabilization — Cement-based alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.4.4.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY99 dollars.
2. FDF O&M labor is based on the FY99 FAT&LC contract and labor classifications.
3. During operations and start-up, FDF O&M labor is dedicated 100% to supporting the Silos 1 and 2 material full-scale remediation project. All other remediation activities on the site will have been completed in FY06.
4. Labor costs are based on four crews working a 48-hr/week schedule to operate and maintain a 24-hr/day, 7-days/week operation schedule.
5. Silos 1 and 2 material full-scale treatment facility has a designed operational availability of 70%.
6. The O&M staff is 100% dedicated in support of training and start-up of the Silos 1 and 2 material full-scale treatment facility. Training and start-up takes 6 months to complete.
7. Proof of Process testing occurs during start-up activities.

Table C.4.4-2 summarizes the labor staffing requirements to support the CHEM1 O&M activities.

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TABLE C. 4.4-2
OPERATION AND MAINTENANCE LABOR ESTIMATE
CHEMICAL STABILIZATION — CEMENT-BASED

	SHIFT				
POSITION	FIRST	SECOND	THIRD	FOURTH	TOTAL
Plant Manager	1				1
Clerical	1				1
Procurement	1				1
Material Control & Accountability	1	1			2
Engineering Manager	1				1
Plant Engineer	1				1
Process Engineers	1	1			2
Waste Planners	3	3			6
Conduct of Operations	1	1			2
Safety Manager	1				1
Safety Engineer	1	1			2
Radiological Technicians	5	3	2	2	12
Industrial Hygiene	1	1			2
Operations Manager	1				1
Clerical	1				1
Shift Supervisors	2	2	1	1	6
Control Room Operators	4	2	2	2	10
Retrieval Operators	3	3			6
Feed Preparation Operators	2	2			4
Mixer Operators	2	2			4
Container Handlers	5	3			8
Roving Operators	1	1	1	1	4
Laboratory Technicians	3	3			6
Motor Vehicle Operators	2	2			4
Satellite Clothing Area Ops	3	2			5
Maintenance Manager	1				1
Clerical	1				1
Maintenance Supervisors	2	2	1		5
Maintenance Planner	2				2
Maintenance Scheduler	1				1
CMMS Administrator	1				1
Data Entry Clerk	1				1
Maintenance Work Order Preparers	2				2
Automated Work Package Programmer	1				1
Electricians	3	3	3		9
Mill Wrights	3	3	3		9
Instrument Mechanics	3	3	3		9
Pipe Fitters	3	3	3		9
Welders	2				2
Laborers	2				2
Oiler	1				1
DOP Crew (part-time)	7				7
Measure & Testing Equip. Crew (part-time)	4				4
Crane Crew (part-time)	4				4
Totals	92	47	19	6	164

C.4.4.2.2 Inclusions

The O&M cost estimate includes the following cost elements:

- Start-up labor;
- O&M labor;
- Proof of process labor;
- Waste packaging labor;
- Start-up, proof of process, and operation consumables;
- Start-up, proof of process, and operation utilities;
- Spare parts;
- O&M of the RCS and the TTA; and
- Silos 1 and 2 material full-scale remediation contractor's technical over-sight during start-up, proof of process, and operation activities.

C.4.4.2.3 Exclusions

The following elements of cost are excluded from the O&M cost estimate:

- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc.);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation project management cost; and
- Cost of FEMP project management oversight.

C.4.4.2.4 Format and Coding

The O&M cost estimates are compiled and summarized into the following cost centers:

- FDF labor cost
  - FDF O&M labor costs
  - FDF start-up costs
- Material cost
  - Spare parts costs
  - Consumables costs
- Utility cost
- Contractor's technical support cost
  - O&M support costs
  - Start-up support costs
- Risk budget
- Secondary waste

The following discussion provides a brief description of the cost centers.

C.4.4.2.4.1 FDF Labor Cost

FDF labor cost includes the costs for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

The FDF labor cost, summarized in **Table C.4.4-3**, is based on the following:

- FDF O&M labor force (two crews) in **Table C.4.4-2** operates on a 16-hr/day, 5-day/week, 40-hr/week schedule;
- Proof of Process testing with surrogate material is performed in parallel to start-up;
- 0.5 years of start-up/training that uses the FDF O&M labor force (100% dedication to project); and
- 3.0 years total of O&M labor to support Silos 1 and 2 material process operations.

TABLE C. 4.4-3
SUMMARY OF FDF LABOR COST

Start-up FDF Labor Cost	0.5 years @ $11,605,984	$5,802,990
O&M FDF Labor Cost	3.0 years @ $11,605,984	$34,817,950
Total	3.5 years @ $11,605,984	$40,620,940

C.4.4.2.4.2 Material Cost

Material cost includes the costs for consumables (PPE, chemicals, filters office supplies, etc.), and equipment spare and replacement parts.

Table C.4.4-4 summarizes the annual cost for consumables and spare parts based on information from the *IT POP Final Report* (**Appendix H, Attachment H3**) and the **Basis of Design and Description** (**Appendix G**).

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TABLE C. 4.4-4
ANNUAL CONSUMABLE AND SPARE PARTS COST DATA

Spare Parts	$302,770	per year
Consumables	$844,714	per year
Total	$1,147,484	per year

Therefore, the total material cost is summarized in **Table C.4.4-5** as follows:

TABLE C. 4.4-5
SUMMARY OF MATERIAL COSTS

Material	Expenditure	Cost
Spare Parts	$ 302,770 @ 3.5 years	$1,059,695
Consumables	$ 844,714 @ 3.5 years	$2,956,500
Total	$ 1,147,484 @ 3.5 years	$ 4,016,195

C.4.4.2.4.3 Utility Cost

Utility cost is the cost for utilities to support the start-up, proof of process, and operation of the Silos 1 and 2 material full-scale remediation activities. This cost includes electricity, natural gas, and oxygen. Cost of water is included in the FEMP site support cost, which is not included in this estimate.

The following **Table C.4.4-6** is a summary of the annual cost for utilities based on information from the *IT POP Final Report* **(Appendix H, Attachment H3)** and **the Basis of Design and Description (Appendix G)**. Water usage is not addressed in this estimate because water usage is covered in the FEMP site support cost.

TABLE C. 4.4-6
ANNUAL UTILITY COST FOR CHEMICAL STABILIZATION — CEMENT-BASED

Electrical	15,481,095 kWhr @ .06/kWhr	$928,866 per year

Based on the Chemical Stabilization — Cement-based operation and start-up schedule assumptions, the utility cost is summarized in **Table C.4.4-7**.

TABLE C. 4.4-7
UTILITY COST FOR CHEMICAL STABILIZATION — CEMENT-BASED

O&M	$ 928,866 @ 3.0 years	$2,786,600
Start-up and Training	$ 928,866 @ 0.5 years	$ 464,430
Total Utility Cost	$ 928,866 @ 3.5 years	$3,251,030

C.4.4.2.4.4 Contractor's Technical Support Cost

The contractor's technical support cost includes the contractor's cost to support start-up and operation of the Silos 1 and 2 material full-scale treatment facility. This cost includes technology-specific laboratory support, training support labor, start-up technical oversight labor, and operational technical oversight labor.

The contractor's total technical support cost for Chemical Stabilization — Cement-based is based on the *IT POP Final Report* (**Appendix H, Attachment H3**); it is summarized in **Table C.4.4-8:**

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TABLE C. 4.4-8
CONTRACTOR'S TOTAL TECHNICAL SUPPORT COSTS

Contractor Support for O&M	$2,208,960
Contractor Support for Start-up Cost	$1,154,320
Total Technical Support Cost	$3,363,280

C.4.4.2.4.5 Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the O&M of the Silos 1 and 2 material full-scale treatment facility.

C.4.4.2.4.6 Secondary Waste Cost

Secondary waste cost is defined as those costs accrued for the treatment, sizing, packaging, transportation and disposal of the solid secondary waste generated during Silos 1 and 2 waste remediation operation.

C.4.4.2.5 Methodology

The methods used to prepare the O&M cost estimate are discussed next.

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using the basis of design, preconceptual design drawings, and the technical judgement of senior FDF operation, maintenance, and waste management supervisory personnel. The FY99 plan labor rates were then applied to the estimated resources to obtain the FDF O&M labor cost estimate.

Material Cost

The material (consumables and spare parts) cost estimate is based on information provided by the POP contractor's final report.

Utility Cost

The utility cost estimates is based on information provided by the POP contractor's final report.

Contractor's Technical Support Cost

The contractor's technical support cost estimate is based on information provided by the POP contractor's final report.

Risk Budget

Risk budget is the cost allowance for risk and uncertainties associated with the O&M of the Chemical Stabilization — Cement-based facility. The risk budget was developed following analyses of the probability of schedule delays based on technology, historical data and professional judgement (see **Table C.4.4-9**).

The O&M risk budget was determined to be 24% of operation, maintenance, and project management cost. The 24% risk factor is calculated using the FEMP cost risk analysis program; it is based on an operational schedule risk of 10.2 months of delay due to potential start-up problems and downtime associated with spare parts of specialized equipment.

Secondary Waste Cost

The secondary waste cost is estimated as the volume of the spare parts, filter, and PPE material cost. All secondary waste is packaged and disposed of the NTS.

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TABLE C. 4.4-9
OPERATION AND MAINTENANCE SCHEDULE RISK BUDGET
CHEMICAL STABILIZATION — CEMENT-BASED (CHEM1)

Risk Activity	Schedule Delay of Risk Activity	Probability of Risk Activity
Filter press clogging problems (replace filter press)	Filter element replacement is covered in the off-shift maintenance but replacing the filter press is 2 months delay.	(50% x 2 = 1 month)
Remote handling issues	Remote handling hardware is not "off-the-shelf" standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Process control sampling and lab analysis delays	Lab analysis for formula validation (2 days to process sample & 7-day curing) if each tank has a weeks batch results in 1 day schedule delay per week or 3-month schedule delay.	(50% x 3 = 1.5 months)
Feed Prep System clogging	Feed Prep System clogging (normal flushing and cleaning covered in the normal maintenance).	*(See note)
Reduced waste loading	Reduced waste loading resulting in schedule delay 1.8 months (see below for details).	5.4 months
Total		10.15 months

CHEM1 Operational Risk Factor

10.2 months of potential delay/42-month operation and start-up period = 24%.
Note: 70% operation availability addresses the minor day-to-day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Schedule Risk Budget

CHEM1 assumes a reduction in waste loading from 30 wt% to 20 wt%.
Risk Budget Factor ➡ (30-20 wt%)/20 wt% ➡ 50% @ 30% probability = 15%.
Potential Schedule Delay ➡ 15% x 36 months of operation = 5.4 months.

C.4.4.2.6 References

The following references were used to prepare the O&M cost estimate:

- *IT POP Final Report* **(Appendix H, Attachment H3)**; and
- **Basis of Design and Description (Appendix G).**

C.4.4.2.7 Attachments

Detailed O&M cost summaries for the CHEM1 alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.4.4.I

O&M Cost Estimate Summary for

Chemical Stabilization — Cement-based

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Operations & Maintenance Manpo	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Operations & Maintenance Manpower														
21	Manpower	1	ls	3.00			11,605,984				34,817,950				$34,817,950
26	Spare Parts/Consumables	1	ls	3.00					302,769				908,310		$908,310
27	Health Physics	1	ls	3.00			450,943		2,083,200		450,943		2,083,200		$2,534,143
25	Electrical	1	ls	3.00					928,866				2,786,600		$2,786,600
28	Subcontractor Support	1	ls	1.00				2,208,960				2,208,960			$2,208,960
	O&M Startup Costs														
21	Manpower	1	ls	0.50			11,605,984				5,802,990				$5,802,990
26	Spare Parts/Consumables	1	ls	0.50					302,769				151,380		$151,380
27	Health Physics	1	ls	0.50			75,157		347,200		75,157		347,200		$422,357
25	Electrical	1	ls	0.50					928,866				464,430		$464,430
24	Startup costs	1	ls	1.00				1,154,322				1,154,320			$1,154,320
22.a	Secondary Waste to OTHER	1	ls									$98,415			$98,415
30	Secondary Waste to NTS	1	ls									$600,429			$600,429

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OPERATIONS AND MAINTENANCE MANPOWER
Chemical Stabilization - Cement

POSITION	SHIFT FIRST	SECOND	THIRD	FOURTH	TOTAL	HRS/WK	TOTAL HOURS	SALARY ($/HR)	ANNUAL EXPENSE
Plant Manager	1				1	40	6240	$60.00	$124,800
Clerical	1				1	40	6240	$23.00	$47,840
Procurement	1				1	40	6240	$43.50	$90,480
Mat'l Control & Accountability	1	1			2	40	12480	$41.75	$173,680
Engineering Manager	1				1	40	6240	$65.00	$135,200
Plant Engineer	1				1	40	6240	$55.00	$114,400
Process Engineers	1	1			2	40	12480	$55.00	$228,800
Waste Planners	3	3			6	40	37440	$44.00	$549,120
Conduct of Operations	1	1			2	40	12480	$42.50	$176,800
Safety Manager	1				1	40	6240	$60.00	$124,800
Safety Engineer	1	1			2	40	12480	$46.00	$191,360
Radiological Technicians	5	3	2	2	12	40	74880	$33.50	$836,160
Industrial Hygiene	1	1			2	40	12480	$46.00	$191,360
Operations Manager	1				1	40	6240	$60.00	$124,800
Clerical	1				1	40	6240	$23.00	$47,840
Shift Supervisors	2	2	1	1	6	40	37440	$42.50	$530,400
Control Room Operators	4	2	2	2	10	40	62400	$30.00	$624,000
Retrieval Operators	3	3			6	40	37440	$30.00	$374,400
Feed Preparation Operators	2	2			4	40	24960	$30.00	$249,600
Mixer Operators	2	2			4	40	24960	$30.00	$249,600
Container Handlers	5	3			8	40	49920	$30.00	$499,200
Roving Operators	1	1	1	1	4	40	24960	$30.00	$249,600
Laboratory Technicians	3	3			6	40	37440	$29.00	$361,920
Motor Vehicle Operators	2	2			4	40	24960	$30.00	$249,600
Satellite Clothing Area Ops	3	2			5	40	31200	$30.00	$312,000
Maintenance Manager	1				1	40	6240	$60.00	$124,800
Clerical	1				1	40	6240	$23.00	$47,840
Maintenance Supervisors	2	2	1		5	40	31200	$42.50	$442,000
Maintenance Planner	2				2	40	12480	$42.50	$176,800
Maintenance Scheduler	1				1	40	6240	$42.50	$88,400
CMMS Administrator	1				1	40	6240	$41.00	$85,280
Data Entry Clerk	1				1	40	6240	$23.00	$47,840
Maint Work Order Preparers	2				2	40	12480	$41.00	$170,560
Automated Work Pkg Programmer	1				1	40	6240	$41.00	$85,280
Electricians	3	3	3		9	40	56160	$32.00	$599,040
Mill Wrights	3	3	3		9	40	56160	$32.00	$599,040
Instrument Mechanics	3	3	3		9	40	56160	$32.00	$599,040
Pipe Fitters	3	3	3		9	40	56160	$32.00	$599,040
Welders	2				2	40	12480	$32.00	$133,120
Laborers	2				2	40	12480	$30.00	$124,800
Oiler	1				1	40	6240	$32.00	$66,560
DOP Crew (Part Time)	7				7	40	43680	$32.00	$465,920
Meas & Test Equip Crew (Part Time)	4				4	28	17472	$32.00	$186,368
Crane Crew (Part Time)	4				4	16	9984	$32.00	$106,496
Totals	92	47	19	6	164		[illegible]		$11,805,984

OPERATIONS CONSUMABLES AND MATERIAL COST

Spare Parts/Consumables	$ 302,769.00	per year
PPE and supplies	(see attached detail)	

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Operation and Maintenance
PPE and Supplies
Calculations

APPL A"

PROJECT:	Silos 1 & 2 Cement Stabilization(FS)	SITE SPECIFIC	DATE:	05-Nov-99
ESTIMATE NO.:	C4981005		ESTIMATOR:	J. ELLIS
CLIENT:	DOE	EFFICIENCY / MULTIPLIER ANALYSIS	LOCATION:	FERNALD
WBS NO.:	2.1.3.G.P		TASK NO.:	4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			70.0%	20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
	<---- MULTIPLE SHIFTS-											
WORK WEEK							4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK	//// MULTIPLE-SHIFT ////			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK							OR					
2ND SHIFT					2ND SHIFT		ONE SHIFT			100.0%	3.0%	0.03
3RD SHIFT			3RD SHIFT				ONLY			100.0%	5.0%	0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	87.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 87.4%

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.14

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EFFICIENCY FACTORS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
ENT: DOE
S NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

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EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	14%	14.0
S/T = BASE UNIT MANHOURS		114
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		114
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		114
• PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	4.00%	5	71.00%	81	79.00%	90	147.00%	168	326.00%	372
.S A MULTIPLIER)/TOTAL HRS	1.04	118.6	1.71	194.9	1.79	204.1	2.47	281.6	4.26	485.6
TAL MULTIPLIER w/SITE PROD.	1.1856		1.9494		2.0406		2.8158		4.8564	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

12.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	49.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

JJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.04	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDITN'L.SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING	QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS	QUANTITY	N/A	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)	MINUTES	N/A	15	15	15	15
TOTAL		0	30	30	30	45
MOBILIZATION - ROUND TRIPS	QUANTITY	N/A	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	N/A	15	15	15	15
TOTAL		0	60	60	60	60
COOLDOWNS PER DAY	QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS) 33.33%	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		575	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

8113

OJECT: Silos 1 & 2 Cement Stabilization(FS)

ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

CAPITAL PLANT

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY				
			Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	4	0	$0	C / C+/ B	
SUB-TOTAL		22.18	4		$0		
				$/MD =	$0.00		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	4	0	$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	mC
SUB-TOTAL		5.98	4		$0	
				$/MD =	$0.00	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	48	$3,658	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	48	$39,600	C/B
THERMO STRIPS	EA	50.00	6	48	$14,400	C/B
SUB-TOTAL					$57,660	

MAT'L.$'s
$57,700

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)

TIMATE NO.: C4981005
ENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

--MEDICAL MONITORING --
CAPITAL - PLANT

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	146	584	$21.99	$12,840
ANNUAL PHYSICALS	1	4	146	584	$21.99	$12,840
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	146	146	$21.99	$3,210
SUB-TOTAL						$28,890

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	146	1311	$21.99	$28,830
SUB-TOTAL						$28,830

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	218	2	436	$21.99	$9,600

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	146	0.6424	339

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	0.0%	$7,524,093	$0
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	$7,524,093	$150,500

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$217,800	$57,700	$275,500

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ACTIVITY DURATIONS

8113

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	18-Jul-99	01-Jan-2000	30-Sep-2000	30-Jun-2001	18.0	MONTHS
					0	MONTHS
TOTAL					18.0	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	14.5	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
		01-Jan-2002	03-Jul-2003	01-Jan-2005	36.1	MONTHS
OPERATIONS					36.1	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

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HEALTH PHYSICS

8113

PROJECT: Silos 1 & 2 Cement Stabilization(FS)

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ESTIMATE NOC4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P PLANT OPERATIONS

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY WKR.SHFT. = 182/WK for 3.50 YR DURATION				
PPE LEVEL C / C+ / B : F/HF M		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	17490	$312,017	C / C+/ B	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	17490	$312,017	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	17490	$16,790	C / C+/ B	
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	17490	$18,189	C / C+/ B	
GLOVE, WORK - DISPOSABL	PR	1.02	4	17490	$71,358	C / C+/ B	
APR CARTRIDGES - DISPOSA	PR	11.74	4	17490	$821,317	C / C+/ B	
SUB-TOTAL		22.18	4		$1,551,688		
				$/MD =	$88.72		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVER	PR	4.46	4	34979	$624,033	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	34979	$33,580	mC
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	34979	$36,379	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	34979	$142,716	mC
SUB-TOTAL		5.98	4		$836,708	
				$/MD =	$23.92	

SUBCONTRACTOR REQUIRED	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR	PR	12.70	6	110.7	$8,435	D/C/B
APR w/HALF FACE MASK - (1	EA	22.30	6	55.35	$7,406	C
APR w/FULL FACE MASK - (1	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	27.675	$22,832	C/B
THERMO STRIPS	EA	50.00	6	11.07	$3,321	C/B
SUB-TOTAL					$41,990	

MAT'L.$'s
$2,430,400

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)

ESTIMATE NO: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PLANT OPERATIONS
--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	148	590	$21.99	$12,980
ANNUAL PHYSICALS	4	4	148	2362	$21.99	$51,940
EXIT (TERMINATION) PHYSIC	1	1	148	148	$21.99	$3,250
SUB-TOTAL						$68,170

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	148	1325	$21.99	$29,150
SUB-TOTAL						$29,150

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	514	2	1028	$21.99	$22,600
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	OPERATION WORKING DAYS
2500	226	11	0.0044	148	0.64944	792

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY	0.0%	$40,620,940	$0
			LABOR $'s
WORK DELAYS CAUSED BY	1.0%	$40,620,940	$406,200

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$526,100	$2,430,400	$2,956,500

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OPERATIONS UTILITY COST

Electrical	15481100	.06 KW/hr	$	928,866.00	per year	(See Appendix G for details)
Water			Cost covered by Site Hotel Cost			

Estimated Secondary Waste Streams Generated During Full-scale of the Remediation Facility for Silos 1 & 2 Project

Chemical Stabilization - Cement Based

Source	Material Type	Total Volume 3 Years	Packaged Disposal Volume in CF	Shipped to	No. of LMB
Waste water treatment bag filters	Solid	40 bags	224	NTS	1
Empty Re-Work Containers	Concrete	561,503 lbs / 3,691 cf	9,856	NTS	17
Misc. Replacement Equipment	Solid	116 cf	224	NTS	1
PPE	Solid	18,100 cf	26,815	NTS	27
Freight per Container to NTS	$3,453	Container(s) to NTS	46	$158,829	
Container Burial NTS	$9,600	Container(s) Burial NTS	46	$441,600	
			NTS Total	$600,429	

Source	Material Type	Total Volume 3 Years	Shipped to	Container Type	Total Dollars
Category C (HEPA filters)	Solid	7,735 kg	other	B-25 boxes	$98,415
				Other Total	$98,415

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Total Secondary Waste Cost	$698,844

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CHEMICAL STABILIZATION - CEMENT-BASED

The Department of Energy Oak Ridge Operations
Mixed Waste Disposal under DOE contract
DE-AC0594OR22074

Disclaimer: This should be used for cost estimation purposes only.

Category C Estimate (HEPA filters)

Material:	Debris
Weight of Material:	7735 kg
Container Type:	B-25 Boxes
Treatment Cost:	$47,028.80
Disposal Cost:	$12,774.35
Handling Price:	$6,125.00
Transportation Cost:	$32,487.00
Total:	$98,415.15

Estimated Secondary Waste Streams Generated During Full-scale Operation of the Remediation Facility for Silos 1 and 2 Project

Secondary Waste Streams for CHEM 1					
Source	**Material Type**	**Rate (lb/hr)**	**Total Volume**	**Status**	**Packaged Disposal Volume**
Treated WW	Water	3,704	5,778,240 gal	Process	N/A
RCS Condensate [1]	Water	50	1,310,400 gal	Process	N/A
Waste water treatment bag filters	Solid	~13 bag/yr	40 bags	Dispose	224 cf
Empty Re-work Containers	Concrete	59 total	561,503 lbs 3,691 cf	Dispose	9,856 cf
RCS and Emissions System HEPA filters	Solid	N/A	1,512 cf	Dispose	2,912 cf
Misc. Replacement Equipment [2]	Solid	N/A	116 cf	Dispose	224 cf
RCS carbon	Carbon	1 Lot	5,334 cf	Dispose	8,890 cf
PPE [3]	Solid	4/ day	18,100 cf	Dispose	26,815 cf
Total Estimated Cubic Feet of Packaged Disposed Secondary Waste					49,000 cf

1- Based on continuous operation for three years.
2 - Equipment will be replaced when necessary to maintain normal operation schedule.
3 - Based on the assumption of four complete changes per person per shift.

Revised 11/10/1999 mkm

10/22/99 3:30 PM

Chemical Stabilization-Cement based (Chem 1)

Operation and Maintenance Risk Budget

Risk Activity	Schedule delay of Risk Activity	Probability of Risk Activity
Filter Press clogging problems (Replace filter press)	Filter element replacement is covered in the off-shift maintenance but replacing the filter press is 2 months delay.	(50% x 2 = 1 month)
Remote handling issues	Remote handling hardware is not "off-the shelf" standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Process Control sampling and lab analysis delays	Lab analysis for formula validation (2 days to process sample & 7 day curing) if each tank has a weeks batch results in 1 day schedule delay per week or 3 month schedule delay.	(50% x 3 = 1.5 months)
Feed prep system clogging	Feed prep system clogging (normal flushing and cleaning covered in the off-shift maintenance.	* (See Note)
Reduce waste loading	Reduce waste loading resulting in operation schedule delay 5.4 months, see below for details.	5.4 months
Total		10.15 months of potential delays

Chem 1 Operational Risk Factor

10.2 months of potential delay/42 month operation and startup period = 24%

Note: 70% operation availability addresses the minor day to day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Risk Budget

Chem 1 assume a reduction in waste loading from 30wt% to 20wt%

Risk Budget Factor = 30-20/20 = 50% @ 30% probability = 15%

15% x 36 months of operation = 5.4 months of potential delay

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C.4.5 Decontamination and Demolition Estimate Basis: Chemical Stabilization — Cement-based

C.4.5.1 Introduction

The D&D costs for the Chemical Stabilization — Cement-based (CHEM1) alternative are summarized in **Table C.4.5-1**.

TABLE C. 4.5-1
D&D COST FOR CHEMICAL STABILIZATION — CEMENT-BASED

Chemical Stabilization – Cement-based D&D Cost	$11,240,800
Silos Project Support Area D&D Cost	$10,468,800
D&D NTS Disposal Cost	$10,809,609
Risk Budget	$ 1,197,100
Total D&D Cost Estimate	$33,716,309

<END OF PAGE>

C.4.5.2 Estimate Basis

The cost estimate basis for the D&D cost of the Chemical Stabilization — Cement-based alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.4.5.2.1 Assumptions

The following general assumptions were used in the preparation of the estimates:

1. Costs are expressed in FY 1999 dollars.
2. D&D waste is sent to the NTS for disposal.
3. Labor costs are based on four crews working a 40-hr/week, 10-hr/day schedule, without any allowance for premium time.
4. Construction management staff is dedicated 100% to supporting D&D of the proposed facility.

C.4.5.2.2 Inclusions

The D&D cost estimate includes the following elements:

- Cost of demolition labor;
- Cost of FDF construction management dollars above- and below-grade;
- Waste packaging and transportation labor;
- Below-grade D&D of concrete and underground utilities;
- Above-grade D&D;
- RCS/TTA building D&D;
- FDF D&D planning & engineering;
- Equipment rental dollars; and
- Subcontractor staffing costs.

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C.4.5.2.3 Exclusions

The D&D cost estimate excludes the following elements:

- Premium time cost for overtime; and
- Security, fire department, human resources, etc.

C.4.5.2.4 Format and Coding

The D&D cost estimates are compiled and summarized into the following cost centers:

- Chemical Stabilization — Cement-based D&D;
- Silos project support area D&D;
- D&D NTS disposal; and
- D&D risk budget.

C.4.5.2.4.1 Chemical Stabilization — Cement-based D&D Costs

This is the cost associated with the D&D of the Chemical Stabilization — Cement-based facility. This cost estimate is based on the **Basis of Design and Description (Appendix G)** and the FEMP D&D experience.

C.4.5.2.4.2 Silos Project Support Area D&D Costs

Silos project support area D&D costs include the costs associated with the D&D of the silos area support facilities (i.e., TTA, RCS). This cost estimate is based on information from the AWR preconceptual design provided with the contractor's bid and FEMP D&D experience.

<END OF PAGE>

C.4.5.2.4.3 D&D NTS Disposal Costs

D&D NTS disposal costs are costs for the disposal of D&D debris from the D&D of the Chemical Stabilization — Cement-based facility, the TTA, and RCS.

C.4.5.2.4.4 D&D Risk Budget

The D&D risk budget is a cost allowance for the risks and uncertainties associated with D&D activities. The cost risk budget for D&D is 6%, which is based on the risk analysis of similar FEMP D&D projects.

C.4.5.2.5 Methodology

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with D&D of the Silos 1 and 2 material remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates. An activity-based level-of-effort support estimate was developed using preconceptual design drawings and materials of construction from the **Basis of Design and Description (Appendix G)**, and technical judgement of senior FDF D&D and waste management supervisors.

Wage Rates

Wage rates are based on project labor agreement rates, effective October 1998, and are considered FY99 dollars for estimating purposes.

Unit Rates

Unit mhrs, equipment, and material dollars are based on estimating guides and FEMP historical data rates.

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Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the D&D of the Silos 1 and 2 material full-scale treatment facility.

C.4.5.2.6 References

Basis of Design and Description (Appendix G).

C.4.5.2.7 Attachment

Detailed D&D cost summaries for the CHEM1 alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.4.5.I

D&D Cost Estimate Summary for

Chemical Stabilization — Cement-based

ESTIMATE SUMMARY SHEET

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

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DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
Mobilizaton Cost	820		$17,400		$13,800	$800	$32,000
Below Grade	9,092		$184,130				$184,130
Above Grade	38,041		$771,200				$771,200
Demobilization Cost	1,780		$36,400	$8,200	$2,500	$4,900	$52,000
DIRECT FIELD COSTS TOTAL	49,733	$20.29	$1,009,130	$8,200	$16,300	$5,700	$1,039,330
SUPERVISION - CONTRACTOR & PERDIUM	17,920		$427,500	$134,400			$561,900
SMALL TOOLS & CONSUMABLES 3%					$30,300		$30,300
EQUIP. RENTAL (See Equipment Schedule)						$705,600	$705,600
TEMPORARY FACILITIES 6%	1,492		$30,300		$30,300		$60,600
TEMPORARY UTILITY HOOK-UP 3%	970		$19,700		$10,600		$30,300
JOB CLEAN-UP 6%	2,238		$45,400		$15,100		$60,500
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)							
HEALTH PHYSICS S/C	2,124		$43,100		$138,800		$181,900
CERCLA - 40 HRs/FTE	1,250		$25,400				$25,400
GET/SITE ACCESS & JOB SPECIFIC TRAINING	900		$18,300				$18,300
PAYROLL BURDENS & BENEFITS 57%	-	-	$922,700				$922,700
OVERHEAD & PROFIT 20%	-	-		$727,400			$727,400
BOND 1%	-	-		$43,600			$43,600
SALES TAX 6%	-	-			$14,500	$42,700	$57,200
INDIRECT FIELD COSTS TOTAL	26,894		$1,532,400	$905,400	$239,600	$748,300	$3,425,700
DIRECT & INDIRECT FIELD COSTS TOTAL	76,627	$33.17	$2,541,530	$913,600	$255,900	$754,000	$4,465,030
WASTE DISPOSITION MGMT. - FD FERNALD			$890,988	$1,491,635	$2,181,053	$35,450	$4,599,127
OFF-SITE DISPOSAL COSTS (Commercial)							
WASTE MANAGEMENT COSTS TOTAL			$890,988	$1,491,635	$2,181,053	$35,450	$4,599,127
PROJECT CLOSE OUT			$85,826	$15,076			$100,902
FIELD PREPARATION							
CONSTRUCTION MANAGEMENT - FD FERNALD			$1,561,149	$195,322	$44,366		$1,800,837
FD FERNALD FIELD SUPPORT COSTS TOTAL			$1,646,975	$210,399	$44,366		$1,901,739
ENGINEERING/DESIGN/INSPECTION - FD FERNALD			$124,815	$9,718	$6,826		$141,359
ENGINEERING COSTS TOTAL			$124,815	$9,718	$6,826		$141,359
SALES TAX - FD FERNALD							$133,500
SUB-TOTAL (BASE ESTIMATE)							$11,240,800
RISK BUDGET 9.7%							$1,090,400
TARGET ESTIMATE (FY 99 DOLLARS)							$12,331,200
CONTINGENCY 10.7%							$1,202,800
NTS BURIAL FEE							$4,147,271

ESTIMATE PERFORMED BY ESTIMATING SERVICES

F:\ESTIMATE\SILOS\CEMENT_2\CMENT2R2.WK4

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ESTIMATE SUMMARY SHEET

PROJECT: D&D Cement Stabilization

DATE: 16-Aug-99

ESTIMATE NO.: C4981204R2

FACTORS

ESTIMATOR: Wagner

CLIENT: DOE

LOCATION: FERNA[redacted]

WBS NO.: 2.1.3.G.P

TASK NO.: 4S11[redacted]

FIXED PRICE SUBCONTRACT	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOT[redacted]
DFC DOLLARS	$1,009,130	$8,200	$16,300	$5,700	$138,800	$1,178,130
7	2.5185	17.3902	6.2945	124.7895	--	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2087	1.2087	1.2087	1.2087	1.2087	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	3.0442	21.0199	8.0647	159.8850	1.2812	
BASE ESTIMATE $'s	$3,071,986	$172,363	$131,455	$911,345	$177,836	$4,464,984
RISK BUDGET FACTOR	1.0970	1.0970	1.0970	1.0970	1.0970	
TARGET ESTIMATE FACTOR	3.3395	23.0588	8.8470	175.3939	1.4055	
FPS TARGET ESTIMATE (FY99 DOLLARS)	$3,369,968	$189,082	$144,206	$999,745	$195,086	$4,898,088

NOTE:

1.)The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe. SEE De-Escalated Summary.

2.) If there are no DFC Equip. $, enter The IFC Equip. $'s into the direct field cost TOTAL and delete IFC Factor in G65.

3.) If FD Fernald Support dollars appear below, and were generated as a percenatage of the DFC, Risk Budget would apply and these dollars would be de-escalated to FY96. Indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the NO box.
If the FDF Support costs are supported by LOE estimates, use those estimates for input to microframe, enter 'SPACE BAR' in the Yes Box and an X in the N

DOES RISK BUDGET APPLY TO FD FERNALD SUPPORT COSTS	YES	NO
		X

FD FERNALD SUPPORT COSTS	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
FD FERNALD PROJECT MGMT.						$100,902
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM						$100,900
FD FERNALD CONSTRUCTION MGMT.						$1,8[redacted]
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	[redacted]
TOTAL CM						$1,8[redacted]
FD FERNALD WASTE PROGRAM MGMT.						$4,599,127
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM						$4,599,130
FD FERNALD RSO						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO						
FD FERNALD ENGINEERING/DESIGN/INSPECTION						$124,815
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.						$124,820
A/E ENGINEERING/DESIGN/INSPECTION						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E						
SUB-TOTAL PROJECT TARGET EST. (FY99 DOLLARS)						$11,523,778

If FDF Support Costs were based on % defaults, indicate 'Yes' above. These costs are considered FY99 $'s and Risk Budget applies.

If FDF Support Costs were based on LOE estimates provided by the CAM's, indicate 'NO' and escalate the LOE dollars to FY99. ($\bar{x}$ 1.079)
Risk Budget will NOT apply. Separate the Sales Tax below.

The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

OTHER FD FERNALD SALES TAX - 6%						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER FD FERNALD SALES TAX						

TOTAL PROJECT TARGET EST.	(FY99 DOLLARS)	$11,523,778

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ESTIMATE SUMMARY SHEET

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

Direct Field Cost w/FACTORS AND RISK BUDGET

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YES	NO
X	

DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PAY ITEM NO.	DESCRIPTION	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
						138800	
	Mobilizaton Cost	17400		13800	800	138800	170800
		$58,110		$122,090	$140,320	$195,090	$515,610
	Below Grade	184130					184130
		$614,900					$614,900
	Above Grade	771200					
		$2,575,410					$2,575,410
	Demobilization Cost	36400	8200	2500	4900		
		$121,560	$189,080	$22,120	$859,430		$1,192,190
	TOTAL DIRECT FIELD COSTS w/FACTORS	(FY99 DOLLARS)					$4,898,110

NOTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

CONTAINER PURCHASE & PREPARATION

Labor — 4 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	0.25	$9.17
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28
WASTE - Planner	$37.12	1.00	$37.12
IH - Industrial Hygiene	$25.93	0.00	$0.00
MVOH - HEO	$25.71	4.00	$102.85
MVOH - HAZWAT	$25.71	4.00	$102.85
QA - Performance/QA	$37.30	0.50	$18.65
Total Labor/Container	$27.99	10.00	$279.92

Material

Description	Rate	Qty	Total
Misc - Caulk, banding	$12.79	5	$63.93
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00
Reconditioned L-WMB Container	$4,779.37	1	$4,779.37
Total Material/Container			$4,843.30

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.25	$9.71
Tractor	$38.84	0.25	$9.71
Forktruck	$10.79	0.25	$2.70
Flatbed trailer	$16.19	0.25	$4.05
Total Equipment/Container			$26.17
Total Container Purchase & Preparation			$5,149.38

CONTAINER PACKAGING

Labor — 2 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	1.00	$36.69
WASTE - Waste Tech	$37.12	4.00	$148.47
CLRK - MC&A Clerk	$19.62	0.25	$4.90
RAD - Rad Tech	$28.56	4.00	$114.24
MVOH - HEO	$25.71	8.00	$205.70
MVOH - HAZWAT	$25.71	8.00	$205.70
QA - Performance/QA	$37.30	1.00	$37.30
Total Labor/Container	$28.69	26.25	$753.01

PPE Material $'s

Description	Rate	Qty/day/wkr	Total
Protec Coveralls	$5.72	4	$22.87
Protec shoe covers	$0.42	4	$1.68
Powdered latex gloves	$0.07	4	$0.28
Cotton glove liners	$0.41	4	$1.64
Leather Gloves	$3.05	4	$12.21
Respirator Catridges	$4.75	4	$18.99
Total PPE Material/wkr/day			$57.68
Total PPE Material/container	6	wkrs	$173.05

Equipment

Description	Rate/Day	Days	Total
Trackhoe w/grappler	$38.84	0.5	$19.42
Forktruck	$10.79	0.5	$5.40
Total Equipment/Container			$24.82
Total Packaging			$950.87

CONTAINER STAGING

Labor

Description	Rate	Hours	Total
CLRK - Data Entry Clerk	$19.62	0.25	$4.90
CLRK - MC&A Clerk	$19.62	2.00	$39.23
QA - Performance/QA	$37.30	1.00	$37.30
MAINT - Shipping Supv	$36.69	0.50	$18.34
WASTE - Waste Tech	$37.12	4.00	$148.47
RAD - Rad Tech	$28.56	2.00	$57.12
WASTE - Shipping Coord	$37.12	1.00	$37.12
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	4.00	$102.85
Total Labor per Truckload	$29.99	15.25	$457.41
Total Labor per Container	1	/truck	$457.41

Material

Description	Rate	Qty	Total
Barcode labels	$0.30	2	$0.60
Container seals	$0.28	1	$0.28
Laminate for labels	$0.46	2	$0.93
Total Material/Container			$1.81

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Staging			$474.76

CONTAINER SHIPPING PREPARATION

Labor

Description	Rate	Hours	Total
MAINT - Traffic Coord	$36.69	2.00	$73.37
CLRK - MC&A Clerk	$19.62	3.00	$58.85
QA - Performance/QA	$37.30	4.00	$149.20
RAD - Rad Tech	$28.56	3.17	$90.54
WASTE - Shipping Coord	$37.12	0.10	$3.71
MAINT - Transportation	$36.69	1.50	$55.03
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	0.75	$19.28
MVOH - MVO	$25.71	1.50	$38.57
CRFT - Carpenter	$27.32	0.50	$13.66
UTIL - Laborer	$24.14	1.00	$24.14
MVOH - HEO	$25.71	1.00	$25.71
UTIL - Mechanic	$24.14	0.33	$7.97
Total Labor/Truckload	$29.57	19.35	$572.10
Total Labor per Container	1	/truck	$572.10

Material

Description	Rate	Qty	Total
Placards	$0.38	4	$1.51
Trailer seals	$0.28	1	$0.28
Wood bracing 2x4 - LF	$0.65	40	$25.90
Paint	$17.28	0.1	$1.73
Banding	$0.05	20	$1.08
Total Material/Container			$30.49

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Shipping Preparation			$618.13

CONTAINER SHIPPING - FREIGHT

Flatbed to Nevada Test Site			$3,452.80
Total Freight per Container	1	/truck	$3,452.80

Total Waste Mgmt. Cost/TOP LOADING ISO	$10,645.94

Container Burial - NTS	Rate	Vol cu ft	Total
Top Loading L-WMB Container	$7.50	1,280	$9,600.00

****All costs are in stated in FY99 Dollars.****

Multiply these dollars by 0.9268 to = FY96 $'s for input to MF.
Performed by Estimating Services

Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

LOE SUMMARY INPUT - DEESCALATED TO FY96 DOLLARS

Labor Description	FY99 Rate	Hours	FY99 Total	0.9268	FY96 $'s	NO. of CONTAINERS	432	TOTAL FY96 $'s
MAINT - Ops Supv	$36.69	1.25	$45.86		$42.50			
MAINT - Shipping Supv	$36.69	0.50	$18.34		$17.00			
MAINT - Traffic Coord	$36.69	2.00	$73.37		$68.00			
MAINT - Transportation	$36.69	1.50	$55.03		$51.00			
MAINT		5.25	$192.60		$178.50	432		$77,113.33
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28		$8.60			
WASTE - Planner	$37.12	1.00	$37.12		$34.40			
WASTE - Waste Tech	$37.12	8.00	$296.94		$275.20			
WASTE - Shipping Coord	$37.12	1.10	$40.83		$37.84			
WASTE		10.35	$384.17		$356.05	432		$153,811.93
IH - Industrial Hygiene	$25.93	0.00	$0.00		$0.00			
Industrial Hygiene		0.00	$0.00		$0.00			
QA - Performance/QA	$37.30	6.50	$242.46		$224.71			
QA		6.50	$242.46		$224.71	432		$97,074.23
RAD - Rad Tech	$28.56	9.17	$261.91		$242.73			
RAD		9.17	$261.91		$242.73	432		$104,861.12
CRFT - Carpenter	$27.32	0.50	$13.66		$12.66			
CRFT		0.50	$13.66		$12.66	432		$5,469.21
MVOH - HEO	$25.71	13.00	$334.26		$309.80			
MVOH - HAZWAT	$25.71	16.75	$430.69		$399.16			
MVOH - MVO	$25.71	1.50	$38.57		$35.75			
MVOH		31.25	$803.52		$744.70	432		$321,710.53
UTIL - Warehouse Attendant	$24.14	1.00	$24.14		$22.37			
UTIL - Laborer	$24.14	1.00	$24.14		$22.37			
UTIL - Mechanic	$24.14	0.33	$7.97		$7.38			
UTIL		2.33	$56.24		$52.12	432		$22,517.13
CLRK - MC&A Clerk	$19.62	5.25	$102.99		$95.45			
CLRK - Data Entry Clerk	$19.62	0.25	$4.90		$4.55			
CLRK		5.50	107.89		$99.99	432		$43,196.42
TOTAL LABOR HOURS & DOLLARS		70.85	$2,062.44		$1,911.47	432		$825,753.91

Misc. Material Description	Rate	Qty	Total	FY96 $'s	NO. of CONTAINERS	432	TOTAL FY96 $'s
			$0.00	$0.00			
Misc - Caulk, banding	$12.79	5	$63.93	$59.25			
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00	$0.00			
Barcode Labels	$0.30	2	$0.60	$0.56			
Container Seals	$0.28	1	$0.28	$0.26			
Laminate for Labels	$0.46	2	$0.93	$0.86			
Placards	$0.38	4	$1.51	$1.40			
Trailer Seals	$0.28	1	$0.28	$0.26			
Wood bracing 2x4 - LF	$0.65	40	$25.90	$24.00			
Paint	$17.26	0.1	$1.73	$1.60			
Banding	$0.05	20.0	$1.08	$1.00			
TOTAL MISC. MATERIAL DOLLARS		85.10	$96.23	$89.19	432		$38,529.23

Container Purchase - Material							
Reconditioned L-WMB Container	$4,779.37	1.00	$4,779.37	$4,429.52			
TOTAL CONTAINER PURCHASE DOLLARS		1.00	$4,779.37	$4,429.52	432		$1,913,550.99

Equipment Description	Rate/Day	Days	Total	FY96 $'s	NO. of CONTAINERS	432	TOTAL FY96 $'s
Taylor - forktruck	$38.84	0.65	$25.25	$23.40			
Tractor	$38.84	0.65	$25.25	$23.40			
Forktruck	$10.79	0.75	$8.09	$7.50			
Flatbed Trailer	$16.19	0.25	$4.05	$3.75			
Trackhoe w/grappler	$38.84	0.50	$19.42	$18.00			
TOTAL EQUIPMENT DOLLARS		2.80	$82.06	$76.05	432		$32,854.17

PPE MATERIAL COST Description	WKR/DAY	$/DAY	Total	FY96 $'s	NO. of CONTAINERS	432	TOTAL FY96 $'s
Total PPE Material/container	6	57.68	$173.05	$160.38			
				$160.38	432		$69,285.35

CONTAINER SHIPPING - FREIGHT							
Flatbed to Nevada Test Site			$3,452.80	$3,200.06	432		$1,382,423.78
TOTAL FDF WASTE MGMT. COSTS		FY99	$10,645.94	FY96 $'s	432		$4,262,397.42
TOTAL DOE NTS BURIAL FEE COSTS		1280.00	552960 cu.ft.		432	$6.95	$3,843,624.96

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

ASSUMPTIONS

CONTAINER PREPARATION:

a. Four containers can be prepared per day.
b. Containers are reconditioned and the prices reflect the current acquisition contract costs.

CONTAINER PACKAGING:

a. Two containers can be packaged per day.
b. PPE quantities are for six workers.
c. PPE pricing is based on unit costs from the Lab Safety catalog and escalated to FY98 dollars.

CONTAINER STAGING:

a. The labor to stage containers to load on a flatbed truck. Divide by containers / truck load. For this study, assume 1 container per truck load.
b. The material and equipment costs are for one container.

CONTAINER SHIPPING PREPARATION:

a. The labor to prepare and load a flatbed truck. Divide by containers per truck load. For this study assume 1 container per truck load. (42,000# gross weight)
b. The material and equipment costs are for one container.

CONTAINER SHIPPING FREIGHT:

a. Shipping charges are based on an avg. of three carrier contract rates currently being used at the site.
b. NTS burial costs are the anticipated FY98 rates that include shipping scrap copper volumes. If this does not happen, rates could be as high as $12.50 per cubic foot.

LABOR:

a. These costs are for direct field/operations costs. Project management costs are excluded.
b. Labor dollars are based on the FY99 Replan rates and are considered FY98 dollars.

EQUIPMENT:

a. Equipment dollars are for maintenance costs only. Any purchase cost and fuel usage have been excluded.

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D & D Cement Stabilization

Unbulked Material Estimates (ft3)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Cement Stabilization	69,954		145,081				7,729	264		223,028
Total	**69,954**		**145,081**				**7,729**	**264**		**223,028**

D & D Cement Stabilization

Bulked Material Estimates (ft3)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Cement Stabilization	237844		188605				15458	528		442435
Total	**237844**		**188605**				**15458**	**528**		**442435**
Container	ROB		ROB				ROB	ROB		
Quantity	298		472				20	1		
Disposition	OSDF		OSDF				OSDF	OSDF		

442,435 / 1,025 = 432 ALL BOXES TO NTS

D & D Cement Stabilization

Material Weight Estimates (Tons)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
Cement Stabilization	875		8705				58	2		9640
Total	**875**		**8705**				**58**	**2**		**9640**

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DEBRIS BULKING FACTORS

* A - Accessible Metals (OSDF 2)
  Bulking Factor 3

* B - Inaccessible Metals (OSDF 2)
  Bulking Factor 3

* C - Process-Related Metals
  Bulking Factor 3

* D - Light-Gauge Metals (OSDF 2)
  Bulking Factor 2

* E - Concrete (OSDF 2)
  Bulking Factor 1.3

* G - Non-Regulated ACM (OSDF 2/3)
  Bulking Factor 1.2

* H - Regulated ACM (OSDF 5)
  Bulking Factor 3

* I - Miscellaneous Debris (OSDF 2/4)
  Bulking Factor 3.5

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilizaton Cost				820						17,400		13,800	800	$32,000
	Below Grade Product Hand'l&Storage				3,992						80,840				$80,840
	Below Grade Analytical Lab				54						1,090				$1,090
	Below Grade Mech/Elect				550						11,140				$11,140
	Below Grade Warehouse				724						14,660				$14,660
	Below Grade Additive Storage				269						5,440				$5,440
	Below Grade On-Site Storage				2,906						58,850				$58,850
	Below Grade Site Work				245						4,960				$4,960
	Below Grade Interconnecting Facility				166						3,370				$3,370
	Below Grade Equipment Shelter				186						3,780				$3,780
	Above Grade Product Hand'l&Storage				14,115						285,810				$285,810
	Above Grade Analytical Lab				594						12,020				$12,020
	Above Grade Mech/Elect				1,704						34,510				$34,510
	Above Grade Warehouse				506						10,230				$10,230
	Above Grade Control Room				80						1,610				$1,610
	Above Grade Additive Storage				2,451						49,630				$49,630
	Above Grade On-Site Storage				3,845						77,850				$77,850
	Above Grade Site Work				1,819						36,840				$36,840
	Above Grade PPE Trailer				90						1,810				$1,810
	Above Grade Interconnecting Facility				78						1,580				$1,580
	Above Grade Equipment Shelter				149						3,020				$3,020
	Equipment				8,388						170,800				$170,800
	Piping Systems				489						9,900				$9,900
	Instrumentation				317						6,420				$6,420
	Electrical				3,416						69,170				$69,170
	Demobilization Cost				1,780						36,400	8,200	2,500	4,900	$52,000
	Total Direct Cost				49,733						$1,009,130	$8,200	$16,300	$5,700	$1,039,330

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Temporary Utilities	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		1000	20.27			1500	3.50	$20,270		$1,500	$3,500	$25,270
D	Remove Temporary Utilitries	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000			$3,240	$8,220			$11,460
	Total				1,780						$36,400	$8,200	$2,500	$4,900	$52,000

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Product Hand'l & Storage														
	Concrete Below grade														
mC	SOG	930	cy	1.08	1924	20.25					$38,960				$38,960
mC	Structural footings	295	cy	1.08	610	20.25					$12,350				$12,350
mC	Wall footings	515	cy	1.08	1065	20.25					$21,570				$21,570
mC	Equipment foundations	190	cy	1.08	393	20.25					$7,960				$7,960
	Product Hand'l & Storage														
	Concrete Above grade														
mC	Grout 300cf / 27	11	cy	1.08	23	20.25					$470				$470
mC	Walls	1900	cy	1.08	3930	20.25					$79,580				$79,580
mC	Elevated floor	1060	cy	1.08	2193	20.25					$44,410				$44,410
mC	Tilt up walls 12,500sf x 1' thick / 27	463	cy	1.08	958	20.25					$19,400				$19,400
mC	Columns for mod. walls	125	cy	1.08	259	20.25					$5,240				$5,240
	Product Hand'l & Storage														
	Structural Steel														
mC	Metal roofing 20guage 1.5#/sf	16790	sf	0.008	257	20.25					$5,200				$5,200
mC	Light steel	43	ton	5.00	412	20.25					$8,340				$8,340
mC	Medium steel	48	ton	5.00	460	20.25					$9,320				$9,320
mC	Heavy steel	53	ton	5.00	508	20.25					$10,290				$10,290
mC	Crane rails	5	ton	5.00	48	20.25					$970				$970
mC	Checkered plate 3030 sf 5/16" 12.75#/sf	19	ton	5.00	185	20.25					$3,750				$3,750
mC	Ladders 6#/lf 263 lf	0.79	ton	5.00	8	20.25					$160				$160
mC	Stairs 50#/riser 157 risers	4.00	ton	5.00	38	20.25					$770				$770
mC	Handrail 2runs 2" cs pipe=7.3#/lf 70 lf	0.26	ton	5.00	2	20.25					$40				$40
mC	Davits 0 ea		ton	5.00		20.25									
mC	Crane rail box beam		ton	5.00		20.25									
mC	Pre-engineered struct 4050sf * 9#	18.2	ton	5.00	175	20.25					$3,540				$3,540
	Product Hand'l & Storage														
	Architectural/Buildings/Finishes														
mC	Metal stud w/ gyp. board 3/8"	2640	sf	0.05	233	20.25					$4,720				$4,720
mC	Siding 1/8" metal	36080	sf	0.02	1382	20.25					$27,990				$27,990
mC	Membrane roofing 1/16" sealant	17780	sf	0.02	681	20.25					$13,790				$13,790
mC	Roof insulation 1/2"	17780	sf	0.02	613	20.25					$12,410				$12,410
mC	Fiberboard 1/2"	17780	sf	0.02	613	20.25					$12,410				$12,410
mC	Batten insulation 1/2"	17780	sf	0.02	613	20.25					$12,410				$12,410
mC	Double ext. doors metal	3	ea	0.67	4	20.25					$80				$80
mC	Single ext. drs. mtl.	4	ea	0.50	4	20.25					$80				$80
mC	Roll-up dr. 14'x14' mtl.	2	ea	3.20	12	20.25					$240				$240
mC	Double interior dr mtl.	3	ea	0.67	4	20.25					$80				$80
mC	Single interior dr. mtl	3	ea	0.50	3	20.25					$60				$60

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
mC	HVAC Duct galv. steel. medium	33	ton	5.00	314	20.25					$6,360				$6,360
mC	HVAC dampers	1	ton	5.00	10	20.25					$200				$200
mC	HVAC accessories	1	ton	5.00	10	20.25					$200				$200
mC	HVAC supports	1	ton	5.00	10	20.25					$200				$200
mC	Building sprinklers	2000	lf	0.040	153	20.25					$3,100				$3,100
	Analytical Lab														
	Concrete Below grade														
mC	SOG	26	cy	1.080	54	20.25					$1,090				$1,090
	Analytical Lab														
	Concrete Above grade														
mC	Walls	28	cy	1.080	58	20.25					$1,170				$1,170
mC	Elevated slab	18	cy	1.080	37	20.25					$750				$750
	Analytical Lab														
	Structural steel														
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf 62 lf	0.11	ton	5.00	1	20.25					$20				$20
	Analytical Lab														
	Architectural/Buildings/Finishes														
mC	Metal stud w/gyp brd 3/8"	4380	sf	0.05	386	20.25					$7,820				$7,820
mC	Skirt trailers 1/8" metal	684	sf	0.02	24	20.25					$490				$490
mC	Stairs and ramps metal	2	ton	5.00	19	20.25					$380				$380
mC	Single ext. dr. mtl.	4	ea	0.40	3	20.25					$60				$60
mC	Single int. dr. mtl.	19	ea	0.40	15	20.25					$300				$300
mC	Building sprinklers	500	lf	0.04	38	20.25					$770				$770
mC	HVAC Duct	1.4	ton	5.00	13	20.25					$260				$260
	Mech/Elect														
	Concrete below grade														
mC	SOG 175cy * 27	4725	cf	0.04	362	20.25					$7,330				$7,330
mC	Structural footings 60cy * 27	1620	cf	0.04	124	20.25					$2,510				$2,510
mC	Equipment foundations30cy * 27	810	cf	0.04	62	20.25					$1,260				$1,260
mC	Grout	30	cf	0.04	2	20.25					$40				$40
	Mech/Elect														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	5610	sf	0.01	86	20.25					$1,740				$1,740
mC	Light steel	8	ton	5.00	77	20.25					$1,560				$1,560
mC	Medium steel	11	ton	5.00	105	20.25					$2,130				$2,130
mC	Heavy steel	13	ton	5.00	124	20.25					$2,510				$2,510
mC	Ladders 28 lf 6#/lf	0.1	ton	5.00	1	20.25					$20				$20

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mech/Elect														
	Architectural														
mC	Siding 1/8"mtl.	11620	sf	0.02	445	20.25					$9,010				$9,010
mC	Roof insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Wall insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Membrane roofing 1/16" sealant	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Fiber board 1/2"	5610	sf	0.018	193	20.25					$3,910				$3,910
mC	Single ext. dr. mtl.	2	ea	0.400	2	20.25					$40				$40
mC	Double ext. dr. mtl.	3	ea	0.67	4	20.25					$80				$80
mC	Roll-up door 14'x14' mtl.	1	ea	3.20	6	20.25					$120				$120
mC	Double int. dr. mtl.	2	ea	0.67	3	20.25					$60				$60
mC	HVAC Duct galv. steel. medium	2.8	ton	5.00	27	20.25					$550				$550
mC	HVAC dampers	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC accessories	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC supports	0.25	ton	5.00	2	20.25					$40				$40
mC	Building sprinklers	600	lf	0.040	46	20.25					$930				$930
	Warehouse														
	Concrete Below grade														
mC	SOG 330cy * 27	8910	cf	0.04	683	20.25					$13,830				$13,830
mC	Structural footings 20cy * 27	540	cf	0.04	41	20.25					$830				$830
	Warehouse														
	Structural steel														
mC	Pre-engineered struct. 9600sf 9#/sf	43	ton	5.00	414	20.25					$8,380				$8,380
	Warehouse														
	Architectural														
mC	Metal stud w/ gyp bd.	100	sf	0.05	10	20.25					$200				$200
mC	Single ext. dr. mtl.	6	ea	0.40	5	20.25					$100				$100
mC	Double exterior door metal	1	ea	0.67	1	20.25					$20				$20
mC	Roll-up door metal 14'x14'	3	ea	3.20	18	20.25					$360				$360
mC	Single interior door metal	1	ea	0.40	1	20.25					$20				$20
mC	Building sprinklers	750	lf	0.040	57	20.25					$1,150				$1,150
	Control Room														
	Architectural														
mC	Metal stud w/ gyp bd.	560	sf	0.05	54	20.25					$1,090				$1,090
mC	Skirting 1/8" metal	348	sf	0.02	13	20.25					$260				$260
mC	Metal ramp & stairs	0.5	ton	5.00	5	20.25					$100				$100
mC	Single interior door metal	4	ea	0.40	3	20.25					$60				$60
mC	HVAC duct, supports, dampers & acces.	0.50	ton	5.00	5	20.25					$100				$100

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Additive Storage														
	Concrete Below grade														
mC	SOG	85	cy	1.08	176	20.25					$3,560				$3,560
mC	Structural footings	25	cy	1.08	52	20.25					$1,050				$1,050
mC	Equipment foundation	20	cy	1.08	41	20.25					$830				$830
	Additive Storage														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	1670	sf	0.01	26	20.25					$530				$530
mC	Light steel	12	ton	5.00	115	20.25					$2,330				$2,330
mC	Medium steel	16	ton	5.00	153	20.25					$3,100				$3,100
mC	Heavy steel	18	ton	5.00	172	20.25					$3,480				$3,480
mC	Checkered plate 3815 sf 5/16" 12.75#/sf	24	ton	5.00	233	20.25					$4,720				$4,720
mC	Stairs 50#/riser 110 risers	3	ton	5.00	26	20.25					$530				$530
mC	Bin loading lines =<2 1/2"	400	lf	0.05	41	20.25					$830				$830
	Additive Storage														
	Architectural														
mC	Siding 1/8"mtl.	27180	sf	0.02	1041	20.25					$21,080				$21,080
mC	Roof insulation 1/2"	1670	sf	0.02	58	20.25					$1,170				$1,170
mC	Wall insulation 1/2"	13590	sf	0.02	468	20.25					$9,480				$9,480
mC	Membrane roofing 1/16" sealant	1670	sf	0.02	58	20.25					$1,170				$1,170
mC	Fiber board 1/2"	1670	sf	0.018	58	20.25					$1,170				$1,170
mC	Single ext. dr. mtl.	1	ea	0.40	1	20.25					$20				$20
mC	Double ext. dr. mtl.	1	ea	0.67	1	20.25					$20				$20
	On-Site Storage														
	Concrete Below grade														
mC	SOG	925	cy	1.08	1913	20.25					$38,740				$38,740
mC	Structural footing	170	cy	1.08	352	20.25					$7,130				$7,130
mC	Continuos footing	310	cy	1.08	641	20.25					$12,980				$12,980
	On-Site Storage														
	Concrete Above grade														
mC	Tilt-up walls 22680 sf * 1ft thick / 27	840	cy	1.08	1737	20.25					$35,170				$35,170
mC	Columns for mod. wall	290	cy	1.08	600	20.25					$12,150				$12,150
	On-Site Storage														
	Structural steel														
mC	Light steel	115	ton	5.00	1101	20.25					$22,300				$22,300
mC	Medium steel	2	ton	5.00	19	20.25					$380				$380
mC	Heavy steel	7	ton	5.00	67	20.25					$1,360				$1,360
mC	Crane rail box beam stl.	13	ton	5.00	124	20.25					$2,510				$2,510
mC	Supports for box beam	1	ton	5.00	10	20.25					$200				$200
mC	Crane rail stops	1	ton	5.00	10	20.25					$200				$200

000542

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	On-Site Storage														
	Architectural														
mC	Single ext. dr. mtl.	8	ea	0.40	6	20.25					$120				$120
mC	Roll-up door metal 14'x14'	3	ea	3.20	18	20.25					$360				$360
mC	Building sprinklers	2000	lf	0.040	153	20.25					$3,100				$3,100
	Site Work														
	Pipe rack / Below grade concrete														
mC	Structural footings 35cy *27	945	cf	0.040	72	20.25					$1,460				$1,460
	Site Work														
	Pipe rack / Structural steel														
mC	Light steel	4	ton	5.00	38	20.25					$770				$770
mC	Medium steel	5	ton	5.00	48	20.25					$970				$970
mC	Heavy steel	6	ton	5.00	57	20.25					$1,150				$1,150
	Site Work														
	Contam'd water/Below grade concrete														
mC	SOG 70cy *27	1890	cf	0.04	145	20.25					$2,940				$2,940
	Site Work														
	Contam'd water/Above grade concrete														
mC	Walls 145 cy * 27	3915	cf	0.04	300	20.25					$6,080				$6,080
mC	Concrete blocks	270	cf	0.04	21	20.25					$430				$430
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf 120lf	0.2	ton	5.00	2	20.25					$40				$40
mC	Double contained pipe HDPE	2100	lf	0.20	804	20.25					$16,280				$16,280
	Site Work														
	Storm water														
mC	Catch Basins	108	cf	0.04	8	20.25					$160				$160
	Site Work														
	HVAC Stack Below grade														
mC	Structural footings 3cy *27	81	cf	0.04	6	20.25					$120				$120
mC	Stack Base 1cy	27	cf	0.04	2	20.25					$40				$40
mC	Duct footings 2cy	54	cf	0.04	4	20.25					$80				$80
mC	Guy anchors 4cy	108	cf	0.04	8	20.25					$160				$160

000543

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Site Work														
	Off-Gas & HVAC Stack Above grade														
mC	Stack structure	3	ton	5	29	20.25					$590				$590
mC	Ladder 80 lf 6#/lf	0.25	ton	5	2	20.25					$40				$40
mC	Grating 43 sf 10#/sf	0.215	ton	5	2	20.25					$40				$40
mC	Platform steel	0.22	ton	5	2	20.25					$40				$40
mC	Davit 1ea	0.25	ton	5	2	20.25					$40				$40
mC	Kickplate	24	lf	0.016	1	20.25					$20				$20
mC	Duct to Stack 100 lf	100	lf	0.143	27	20.25					$550				$550
mC	Duct support 2 ea	0.25	ton	5	2	20.25					$40				$40
mC	Handrail 24 lf 2runs 2"cs pipe 7.3#/lf	0.1	ton	5	1	20.25					$20				$20
	Site Work														
	Poten. Contam. Water														
C	Drain lines	1500	lf	0.16	481	20.25					$9,740				$9,740
	PPE Trailer														
	Architectural														
mC	Metal stud w/ gyp bd.	605	sf	0.05	58	20.25					$1,170				$1,170
mC	Single ext. dr. mtl.	2	ea	0.40	2	20.25					$40				$40
mC	Single interior door metal	4	ea	0.40	3	20.25					$60				$60
mC	Skirting 1/8" metal	324	sf	0.02	12	20.25					$240				$240
mC	Building sprinklers	200	lf	0.040	15	20.25					$300				$300

000544

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	15-ag-001waste rec. tnk. agitator	0.2	tn	20	8	20.25					$160				$160
C	15-ag-003,04,05 Slurry batch tank agitator	0.6	tn	20	24	20.25					$490				$490
C	15-ag-008 Supernatant tank agitator	0.2	tn	20	8	20.25					$160				$160
C	15-pm-001 Rec. tank trans pump A & B	0.2	tn	20	8	20.25					$160				$160
C	15-pm-002 thickener trans pump A & B	0.2	tn	20	8	20.25					$160				$160
C	15-pm-003 Slurry batch trans pump A & B	0.5	tn	20	20	20.25					$410				$410
C	15-pm-004,05 Slurry batch trans pump A & B	1	tn	20	40	20.25					$810				$810
C	15-pm-008 Supt.sump tnk agitator A & B	2.5	tn	20	100	20.25					$2,030				$2,030
C	15-tk-001 Receipt tank	6	tn	20	241	20.25					$4,880				$4,880
C	15-tk-002 Clarifier	2.75	tn	20	110	20.25					$2,230				$2,230
C	15-tk-003,04,05 Slurry batch tank	9	tn	20	361	20.25					$7,310				$7,310
C	15-tk-006 Filt. cake weight & hopper	0.4	tn	20	16	20.25					$320				$320
C	15-tk-008 Supernt. sump tank	1	tn	20	40	20.25					$810				$810
C	15-fl-001 Auto. filter press	25	tn	20	1002	20.25					$20,290				$20,290
C	17-mx-001 Batch mixer & assec.	5	tn	20	200	20.25					$4,050				$4,050
C	17-tk-001 Mixer flush tank & assec.	1	tn	20	40	20.25					$810				$810
C	25-cy-001..021 Roller conveyors	20	tn	20	802	20.25					$16,240				$16,240
C	25-cy-003 Fill station conveyor	1	tn	20	40	20.25					$810				$810
C	25-hd-001 Container handlg forklift	1	tn	20	40	20.25					$810				$810
C	26-bn-001 Recycle weight hopper	0.8	tn	20	32	20.25					$650				$650
C	26-bn-002 Rework batch bin	1.3	tn	20	52	20.25					$1,050				$1,050
C	26-cn-001 Rework bridge crane	12	tn	20	481	20.25					$9,740				$9,740
C	26-cy-001..005 Rework conveyors	5	tn	20	200	20.25					$4,050				$4,050
C	26-cy-006 Rubble conveyor	1	tn	20	40	20.25					$810				$810
C	26-fl-001 Rework fac. vacuum	1	tn	20	40	20.25					$810				$810
C	26-gb-001 Rework glove box	0.4	tn	20	16	20.25					$320				$320
C	26-me-001 Rework head station	0.2	tn	20	8	20.25					$160				$160
C	26-me-004 Remote contrl jack hammer	0.5	tn	20	20	20.25					$410				$410
C	26-me-007 Rubble jaw recycle crusher	0.4	tn	20	16	20.25					$320				$320
C	40-cm-002 Instrument Air Compressor	0.5	tn	21	21	21.25					$450				$450
C	40-m-001 Plant Air Compressor Dryer	0.5	tn	22	22	22.25					$490				$490
C	40-m-002 Instrument Air Compressor Dryer	0.5	tn	23	23	23.25					$530				$530
C	40-ve-001 Plant Air Receiver	0.5	tn	24	24	24.25					$580				$580
C	40-ve-002, 003 Receiver	0.5	tn	25	25	25.25					$630				$630
C	40-cm-001 Air comp. package	0.5	tn	20	20	20.25					$410				$410
C	40-dr-001 Air comp. dryer	0.2	tn	20	8	20.25					$160				$160
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		4,156	20.33					$84,500				$84,500

00054S

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	40-ve-001 Air rec. tank	0.8	tn	20	32	20.25					$650				$650
C	40-cm-002 Inst. air comp.	0.3	tn	20	12	20.25					$240				$240
C	40-dr-002 Instr. air comp. dryer	0.2	tn	20	8	20.25					$160				$160
C	40-ve-002 Instr. air receiving tank	0.3	tn	20	12	20.25					$240				$240
C	41-cm-001 Breathing air sys. A & B	4	tn	20	160	20.25					$3,240				$3,240
C	43-ag-001 Flocculant addit. tnk agitator	0.2	tn	20	8	20.25					$160				$160
C	43-bn-001 Lime addit. bag dump station	0.3	tn	20	12	20.25					$240				$240
C	43-bn-002 Lime addit. filter receiver	0.4	tn	20	16	20.25					$320				$320
C	43-pm-002 Lime addit. trans. pump	0.4	tn	20	16	20.25					$320				$320
C	43-tk-002 Lime addit. slurry tank	0.2	tn	20	8	20.25					$160				$160
C	44-bn-001,004 Cement storage bin	8	tn	20	321	20.25					$6,500				$6,500
C	44-bn-002,003 additive storage bin	11.2	tn	20	449	20.25					$9,090				$9,090
C	44-bl-001..04 Add. exh. blower	2	tn	20	80	20.25					$1,620				$1,620
C	44-bn-005 Additive weight bin delivery	0.5	tn	20	20	20.25					$410				$410
C	44-bn-006 Cement mix del. hopper	1	tn	20	40	20.25					$810				$810
C	44-bn-007 Absorb storage bin	1	tn	20	40	20.25					$810				$810
C	44-cy-001,02,03,04 Air slides	0.4	tn	20	16	20.25					$320				$320
C	44-fl-001..006 Addit. bin baghouse filter	0.6	tn	20	24	20.25					$490				$490
C	44-rv-001..004 Bin rotary valves	0.4	tn	20	16	20.25					$320				$320
C	44-pm-001 Cement/additive trans. pump	0.1	tn	20	4	20.25					$80				$80
C	44-pm-002 Absorbent trans. pump	0.1	tn	20	4	20.25					$80				$80
C	44-vb-001 Cement bin vibrator A & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-002 additive bin vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-003 additive bin vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-004 additive bin vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-005 additive hopper vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-006 addit. del. hopper vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	61-*.* Pot rad wtr. coll. tank & sump	5	tn	21	211	21.25					$4,480				$4,480
C	62-*.* Waste Water Tanks Agitator & sumps	5	tn	22	221	22.25					$4,920				$4,920
C	56-pm-001 Recyl. water line pump	0.3	tn	20	12	20.25					$240				$240
C	63-tk-001, 002 Lab waste tank	0.4	tn	20	16	20.25					$320				$320
C	73-ah-001,03 Cont. process air handlg.	1	tn	20	40	20.25					$810				$810
C	73-ah-002 Cont. process air handlg.	1	tn	20	40	20.25					$810				$810
C	73-ah-005 Stabiliz. fac. air handlg. unit	0.4	tn	20	16	20.25					$320				$320
C	73-ah-004 Rework air handlg. unit	0.5	tn	20	20	20.25					$410				$410
C	73-fa-001 Cont. process area exh fan A & B	0.4	tn	20	16	20.25					$320				$320
C	73-fa-005 Stabiliz. fac. exh. fan	0.2	tn	20	8	20.25					$160				$160
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		1,946	20.55					40,000				$40,000

000546

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	73-fl-001,02,03 Cont. prs air filt. housing	0.2	tn	20	8	20.25					$160				$160
C	73-fl-004 Rework filter housing	0.4	tn	20	16	20.25					$320				$320
C	73-fl-005 Stabiliz. fac. filt. housing	0.4	tn	20	16	20.25					$320				$320
C	73-he-001 Unit heater A..F	0.6	tn	20	24	20.25					$490				$490
C	73-me-001 Press. contrl. damp A..C	0.3	tn	20	12	20.25					$240				$240
C	76-ah-001 Warehouse air handlg. A & B	0.2	tn	20	8	20.25					$160				$160
C	76-ah-002 Maint. room air handler	0.4	tn	20	16	20.25					$320				$320
C	76-fa-001 Warh./curing exh. fan A & B	0.2	tn	20	8	20.25					$160				$160
C	76-fa-002 Maint. rm exh. fan	0.1	tn	20	4	20.25					$80				$80
C	76-fa-003 Elect. rm. exh. fan	0.1	tn	20	4	20.25					$80				$80
C	76-fa-004 Pipeway exh. fan	0.1	tn	20	4	20.25					$80				$80
C	76-fl-001 Warh. filt. housing A & B	0.1	tn	20	4	20.25					$80				$80
C	76-me-001 Wall louver	0.1	tn	20	4	20.25					$80				$80
C	76-fl-002 Maint. rm. filt. housing	0.2	tn	20	8	20.25					$160				$160
C	80-cn-002 Maint. monorail A..E	5	tn	20	200	20.25					$4,050				$4,050
C	80-cn-003 Maint. shop crane	5	tn	20	200	20.25					$4,050				$4,050
C	80-se-001 Machine shop equip.	5	tn	20	200	20.25					$4,050				$4,050
C	80-se-002 Weld shop equip.	1	tn	20	40	20.25					$810				$810
C	80-se-003 Elect. shop equip.	1	tn	20	40	20.25					$810				$810
C	80-se-004 Pipe fab. shop equip.	1	tn	20	40	20.25					$810				$810
C	75-*.* Lab bldg. equip.	5	tn	20	200	20.25					$4,050				$4,050
C	82-cn-001 Bridge crane and robot arm	2	tn	20	80	20.25					$1,620				$1,620
C	82-cn-002 Monorail hoist	8	tn	20	321	20.25					$6,500				$6,500
C	82-cn-003 Bridge crane	8	tn	20	321	20.25					$6,500				$6,500
C	82-me-001,02,03 Fill stations	3	tn	20	120	20.25					$2,430				$2,430
C	82-me-004 Shield wall port A..E	0.5	tn	20	20	20.25					$410				$410
C	83-sd-001,002,009..012,020..025 Shield doors	1.2	tn	20	48	20.25					$970				$970
C	83-sd-003..008,013..019 Air lock door	1.2	tn	20	48	20.25					$970				$970
C	83-sw-001 Shield window A..H	0.8	tn	20	32	20.25					$650				$650
C	84-me-001 Mix sample station	1	tn	20	40	20.25					$810				$810
C	85-nd-001 Radio inspec. station	0.1	tn	20	4	20.25					$80				$80
C	85-tv-001 CCTV inspec. station	0.1	tn	20	4	20.25					$80				$80
C	90-sw-001 Control software, train.	0.1	tn	20	4	20.25					$80				$80
C	93-sa-001..005 Emerg. eyewash/ shower	0.5	tn	20	20	20.25					$410				$410
C	44-bn-008 Absorb day bin	0.2	tn	20	8	20.25					$160				$160
C	94-se-001 Analylitical Laboratory Equip	4	tn	20	160	20.25					$3,240				$3,240
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		2,286	20.25					46,300				$46,300

000547

8113

08/20/99

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Piping Systems														
15	PIPNIG SYSTEMS														
C	Remove 1/2" c.s. gate valve	11	EA	Included											
C	Remove 3/4" c.s. gate valve	10	EA	Included											
C	Remove 2" c.s. gate valve	10	EA	Included											
C	Remove 1/2" s.s. gate valve	31	EA	Included											
C	Remove 3/4" s.s. gate valve	2	EA	Included											
C	Remove 2" s.s. gate valve	2	EA	Included											
C	Remove 1-1/2" s.s. check valve	6	EA	Included											
C	Remove 3" s.s. check valve	4	EA	Included											
40															
C	Remove 1/2" c.s. gate valve	2	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
43															
C	Remove 1/2" s.s. gate valve	8	EA	Included											
C	Remove 3/4" s.s. gate valve	4	EA	Included											
C	Remove 2" s.s. gate valve	4	EA	Included											
C	Remove 3" s.s. check valve	4	EA	Included											
50															
C	Remove 1/2" c.s. gate valve	7	EA	Included											
C	Remove 3/4" c.s. gate valve	2	EA	Included											
C	Remove 2" c.s. gate valve	2	EA	Included											
53															
C	Remove 1/2" c.s. gate valve	3	EA	Included											
C	Remove pipe 4" & <	4500	LF	0.053	478	20.25					$9,680				$9,680
C	Piping material bulk	530	CF	0.01	11	20.25					$220				$220
	Pipe:$100K/($140.46*.60)*(308.2cf)=355.7cf/$100K														
	$149,000/$100,00=1.49*355.7=529.99cf														
	6 inch diameter pipe														
	1 feet long														
	0.2 cubic feet														
	1 LF = .053 man-hours / LF = .2 CF														
	.053 MH/LF * .2 CF = .0106 MN/CF = 1 LF														
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		489	20.25					9,900				$9,900

872000

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
15	Instrumentation														
C	Remove level transmitter	18	EA	Included											
C	Remove process level transmitter	18	EA	Included											
C	Remove pressure indicator	6	EA	Included											
18															
C	Remove element/ transmitter	2	EA	Included											
C	Remove differential press. transmitter	4	EA	Included											
C	Remove instr. piping for transmitter	4	EA	Included											
44															
C	Remove 8" pinch valves	6	EA	Included											
90															
C	Remove process station control	1	EA	Included											
C	Remove DCS	1	EA	Included											
C	Remove motor operated valves	4	EA	Included											
92															
C	Remove fire alarm and evacuation system	1	LOT	Included											
93															
C	Remove real time SOx monitor	1	EA	Included											
C	Remove hps control station	1	EA	Included											
C	Remove auto radio counter	2	EA	Included											
C	Remove passive radon monitor	9	EA	Included											
C	Remove radonn wkg. level monitor	6	EA	Included											
C	Remove body frisker	3	EA	Included											
C	Remove air sampling station (CAM)	11	EA	Included											
C	Remove tool comtamination monitor	2	EA	Included											
C	Remove 8" butterfly valves	30	EA	Included											
C	Remove pneumatic actuated valves	76	EA	Included											
C	Remove piping for pneumatic valves	76	EA	Included											
C	Remove conduit	2000	LF	0.033	132	20.25					$2,670				$2,670
C	Remove cable tray	600	LF	0.021	25	20.25					$510				$510
C	Pipe tubing	1000	LF	0.04	80	20.25					$1,620				$1,620
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT												

8113

000549

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
18	**Instrumentation**														
C	Remove temperature indicator/ transmitter	6	EA	Included											
C	Remove instr. piping for valves	18	EA	Included											
C	Remove process pipe for level trans.	5	EA	Included											
C	Remove instr. pipe for flow transmitter	3	EA	Included											
C	Remove indicator	6	EA	Included											
C	Remove temperature indicator	2	EA	Included											
C	Remove flow indicator	5	EA	Included											
73															
C	Remove HVAC controls	1	LOT	20	40	20.25					$810				$810
76															
C	Remove HVAC controls	1	LOT	20	40	20.25					$810				$810
	Electrical														
	Electrical														
mC	480v pr. &mtr. feeders 19ea*500#	4.75	tn	20	182	20.25					$3,690				$3,690
mC	Conduit & wiring 4" & <	94290	lf	0.016	2889	20.25					$58,500				$58,500
mC	480v distribution MCC 1000# * 5ea	2.5	tn	20	96	20.25					$1,940				$1,940
mC	Transformer 3750kv 1ea * 2000#	1	tn	20	38	20.25					$770				$770
mC	Utility metering cabinet 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Generator 700kw 1ea * 1ton	1	tn	20	38	20.25					$770				$770
mC	Transfer switch 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Stl. pole <18"dia 40'long 20ea.	4	tn	20	153	20.25					$3,100				$3,100
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT												

000550

CONTRACTOR - Stated in FY00 DOLLARS

COST IMPACT MATRIX SHEET

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Estimate No.: C4981005
Project: Silos 1 & 2 Cement Stabilization(FS)
Client: DOE
WBS: 2.1.3.G.P

Est. Chg. No.: 4S11B
Date: 23-Aug-99
Estimator: J. ELLIS
Location: Fernald

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Cement Stabiliz. Piping Labor		Cement Stabiliz. Piping Material		Cement Stabiliz. Instrumentation Labor		Cement Stabiliz. Instrumentation Material		Cement Stabiliz. Electrical Labor		Cement Stabiliz. Electrical Material	
Cost Drivers	Base $	$671,350	Base $	$349,230	Base $	$522,920	Base $	$1,702,730	Base $	$3,061,210	Base $	$1,724,930
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			-1%	10%			-1%	10%		
Material Pricing			-1%	15%			0%	15%			-1%	15%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	5%	0%	10%			0%	5%			0%	10%
Project Definition	0%	5%			0%	5%	0%	5%	0%	10%		
Other												
Range - %	-1%	20%	-1%	25%	-1%	15%	0%	25%	-1%	20%	-1%	25%
Range - $	$664,637	$805,620	$345,738	$436,538	$517,691	$601,358	$1,702,730	$2,128,413	$3,030,698	$3,673,452	$1,707,681	$2,156,163
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Cement Stabiliz. Electrical Equipment		Cement Stabiliz. Paint/Insulation Labor		Cement Stabiliz. Paint/Insulation Material							
Cost Drivers	Base $	$1,226,590	Base $	$627,930	Base $	$160,140	Base $	$0	Base $	$0	Base $	$0
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			0%	10%								
Material Pricing	-1%	20%			-1%	10%						
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	-1%	10%			0%	5%						
Project Definition	-1%	10%	0%	5%								
Other												
Range - %	-3%	40%	0%	15%	-1%	15%	0%	0%	0%	0%	0%	0%
Range - $	$1,188,822	$1,715,826	$627,930	$722,120	$158,539	$184,161	$0	$0	$0	$0	$0	$0
Distribution	Uniform		U		U							
Correlation Rank												

Analyst: _____

Client: _____

000551

8113

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FLUOR DANIEL FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES

8113

August 20, 1999

PROJECT DESCRIPTION: Cement 2 D&D Cement Stabilization
WBS NUMBER: 2.1.3.G.P.
PROJECT ENGINEER: M. Connors
ESTIMATOR: T. Wagner
ESTIMATE NUMBER: C4981204R2

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	x	P & ID's		Work Plan	
Drawings	x	Equipment List	x	Site Walk	
Sketches		Specifications	x	Eng. Mtg.	
Flow Diagrams		Written Scope	x	S/C	
				Estimate	

TYPE OF ESTIMATE:

Change Proposal		Government	
Title II Des.		Conceptual	
Construction		Title I Des.	
Budget/Concpt		Control Estimate	x

BASIS OF ESTIMATE:

Estimate the cost for of the labor, materials, equipment, and overheads that will be required by the vendor to D&D the Cement Stabilization (Cement 2). Assume all waste disposal sent to NTS.

FLUOR DANIEL FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES

August 20, 1999

PROJECT DESCRIPTION: Cement 2 D&D Cement Stabilization
WBS NUMBER: 2.1.3.G.P.
PROJECT ENGINEER: M. Connors
ESTIMATOR: T. Wagner
ESTIMATE NUMBER: C4981204R2

ESTIMATE ASSUMPTIONS

EXECUTION:

This project is estimated to be performed on a 40-hour week, 10 hours a day, with no premium time allowed.

WAGE RATES:

Wage rates within this estimate are based on Planned Labor Agreement rates, effective October 1998 and are considered FY99 dollars for estimating.

ENGINEERING:

Engineering, Procurement and Planning Estimates were provided by others.

CONSTRUCTION MGT:

Construction Management dollars provided by the Project Engineer.

PRODUCTIVITY:

A productivity factor has been developed and applied to the unit man-hours derived from MEANS, Richardson, NECA, and or any other published estimating source. See attachment APPENDIX "A" and APPENDIX "B".

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

FLUOR DANIEL FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES

8113

August 20, 1999

PROJECT DESCRIPTION: Cement 2 D&D Cement Stabilization
WBS NUMBER: 2.1.3.G.P.
PROJECT ENGINEER: M. Connors
ESTIMATOR: T. Wagner
ESTIMATE NUMBER: C4981204R2

UNIT RATES:

Unit man-hours, equipment and material dollars are based on Richardson, MEANS, NECA, historical data and or other published rates.

G & A (HO EXPENSE):

G & A are excluded from the target estimate. The G & A costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

HEALTH PHYSICS:

See attached APPENDIX "C".

RISK BUDGET:

A cost element, based on a Risk Analysis calculated for this estimate to cover a statistical probability of a 50% chance of overrun/under run to the project. The target estimate is the sum of the base estimate and the risk budget.

CONTINGENCY:

An amount budgeted to cover costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties. Contingency is calculated as the delta between the 50% chance of overrun and the 5% chance of overrun, indicated on the risk analysis.

FLUOR DANIEL FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES

August 20, 1999

PROJECT DESCRIPTION: Cement 2 D&D Cement Stabilization
WBS NUMBER: 2.1.3.G.P.
PROJECT ENGINEER: M. Connors
ESTIMATOR: T. Wagner
ESTIMATE NUMBER: C4981204R2

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- Below grade D&D of concrete & underground utilities (Cement facility, mechanical/electrical facility, lab facility, and on-site storage facility).
- Above grade D&D (Cement facility, mechanical/electrical facility, lab facility, on-site storage facility and warehouse).
- FDF D&D planning & engineering
- Equipment rental and operating cost
- Subcontractors's staffing dollars
- FDF Construction management dollars (48 weeks above grade, 8 weeks below grade).

EXCLUSIONS:

- Premium time
- Permits and fees
- FD G & A (Home Office Expense)
- Any second tier subcontract costs
- Field prep not required. FDF CM, break, office, decon trailers will still be operational and available for use during D&D activities.
- During facility shutdown by operations all process systems (piping and tanks) are flushed to the extent that release cleaning during D&D is not required to meet WAC.
- Soil excavation
- Demobilization of FDF CM, break, office, decon trailers.
- Removal of point source utilities and utilities to FDF trailers.
- Safe shutdown activities (utility isolation process, material holdup removal, etc.)
- During facility shutdown by operations all utilities to the buildings/structures has been completed.

COST IMPACT MATRIX SHEET

Estimate No.: C4981204R2
Project: D&D Cement Stabilization
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Date: 20-Aug-99
Estimator: Wagner
Location: FERNALD
TASK NO.: 4S11B

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
$4,703,020	Mobilizaton Cost labor		Mobilizaton Cost matl		Mobilizaton Cost equip		Below Grade labor		Below Grade ppe		Above Grade labor	
Cost Drivers	Base $	$58,110	Base $	$122,090	Base $	$140,320	Base $	$614,900	Base $	$0	Base $	$2,676,410
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor												
Material Pricing			-5%	15%			-5%	15%			-5%	20%
Equipment Rental					-5%	15%						
Subcontract $'s												
Quantity Variation			-5%	10%	-5%	10%						
Contamination							-5%	15%	-5%	15%		
Environmental												
Schedule												
Project Definition	-10%	25%					-5%	10%	-5%	10%	-5%	10%
Range - %	-10%	25%	-10%	25%	-10%	25%	-15%	40%	-10%	25%	-10%	30%
Range - $	$62,299	$72,638	$109,881	$152,613	$126,288	$175,400	$522,665	$860,860	$0	$0	$2,317,869	$3,348,033
Distribution	U		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Demobilization Cost labor		Demobilization Cost s/c		Demobilization Cost matl		Demobilization Cost equip					
Cost Drivers	Base $	$121,560	Base $	$189,080	Base $	$22,120	Base $	$859,430	Base $	$0	Base $	$0
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor	-5%	20%			-5%	15%						
Material Pricing												
Equipment Rental							-5%	15%				
Subcontract $'s			-5%	15%								
Quantity Variation												
Contamination												
Environmental												
Schedule	-5%	10%										
Project Definition			-5%	10%	-5%	10%	-5%	10%				
Range - %	-10%	30%	-10%	25%	-10%	25%	-10%	25%	0%	0%	0%	0%
Range - $	$109,404	$158,028	$170,172	$236,350	$19,908	$27,650	$773,487	$1,074,288	$0	$0	$0	$0
Distribution	U		U		U		U					
Correlation Rank												

Analyst: _____

Client: _____

000557

81 13

PROJECT: D&D Cement Stabilization
ESTIMATE NO.C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

SITE SPECIFIC

EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			80.0%	20.0%	0.16
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
WORK WEEK	<---- MULTIPLE SHIFTS-						4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK	//////// MULTIPLE-SHIFT ////////			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK	////////		OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK 2ND SHIFT 3RD SHIFT			 3RD SHIFT		2ND SHIFT		OR ONE SHIFT ONLY			 100.0% 100.0%	 3.0% 5.0%	 0.03 0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	89.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 89.4%

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.12

000558

APPENDIX "B"

EFFICIENCY FACTORS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	12%	12.0
S/T = BASE UNIT MANHOURS		112
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		112
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		112

• PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	23.00%	26	71.00%	80	79.00%	88	147.00%	165	326.00%	365
(AS A MULTIPLIER)/TOTAL HRS	1.23	137.8	1.71	191.5	1.79	200.5	2.47	276.6	4.26	477.1
TOTAL MULTIPLIER w/SITE PROD.	1.3776		1.9152		2.0048		2.7664		4.7712	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

	14.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	48.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.81	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.23	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DA 4 - 10's		600	600	600	600	600
ADDITN'L SITE SAFETY MEETINGS NOT INCLD. IN BASE	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING	QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS	QUANTITY	2	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		30	30	30	30	45
MOBILIZATION - ROUND TRIPS	QUANTITY	4	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		60	60	60	60	60
COOLDOWNS PER DAY	QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS) 33.33%	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		485	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

000560

APPENDIX "C"

HEALTH PHYSICS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CA		$'s	*	MAN DAYS	MAT'L.$'s	PPE LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1076	$14,397	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1076	$14,397	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	3	1076	$775	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	1076	$839	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	1076	$3,293	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	3	1076	$37,897	C / C+/ B	
SUB-TOTAL		22.18	3		$71,598		
				$/MD =	$66.54		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	PPE LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & B	PR	4.46	3	3746	$50,121	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	3746	$2,697	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	3746	$2,922	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	3746	$11,463	mC
SUB-TOTAL		5.98	3		$67,203	
				$/MD =	$17.94	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	0	$0	C/B
THERMO STRIPS	EA	50.00	6	0	$0	C/B
SUB-TOTAL					$0	

MAT'L.$'s
$138,800

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDE AS PART OF PROJECT COSTS AT THIS TIME.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	50	200	$20.29	$4,060
ANNUAL PHYSICALS	0	4	50	0	$20.29	$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	50	50	$20.29	$1,010
SUB-TOTAL						$5,070

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	6	1	50	278	$20.29	$5,640
SUB-TOTAL						$5,640

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR $'s
	45	2	90	$20.29	$1,800

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.004274	50	0.2137	210

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	1.0%	$1,532,030	$15,300
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	1.0%	$1,532,030	$15,300

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$43,100	$138,800	$181,900

:\ESTIMATE\SILOS\CEMENT_2\STAFFC2B.WK4

APPENDIX "D"

ACTIVITY DURATIONS

FLUOR DANIEL FERNALD

PROJECT: D&D Cement Stabilization
ESTIMATE NO.: C4981204R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	29-Dec-98	01-Jan-2009	19-Jun-2009	05-Dec-2009	11.12	MONTHS
					0	MONTHS
TOTAL					11.1	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	125.8	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS					0	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

F:\ESTIMATE\SILOS\CEMENT 2\STAFFC2B.WK4

000563

ESTIMATE SUMMARY SHEET

FLUOR DANIEL FERNALD

PROJECT:	Vendor "B" (TTA/RCS D & D)	DATE:	20-Aug-99
ESTIMATE NO.:	C4981003	ESTIMATOR:	T Wagner
CLIENT:	DOE	LOCATION:	FERNALD
'BS NO.:	2.1.3.G.0	TASK NO.:	4SWRA

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO.7	Premobilization/Mobilization	820		$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System	1,140		$23,100				$23,100
II	RCS Phase I, II, & III	1,743		$35,300				$35,300
III	Silo Waste Retrieval System	2,204		$44,600				$44,600
IV	Transfer Tank Area	4,520		$91,500				$91,500
	Demobilization Cost	1,400		$28,800	$8,200	$2,500	$3,500	$43,000
DIRECT FIELD COSTS TOTAL		11,827	$20.35	$240,700	$8,200	$16,300	$4,300	$269,500
SUPERVISION - CONTRACTOR - STAFF		8,960		$209,800				$209,800
SMALL TOOLS & CONSUMABLES @ 3%						$7,200		$7,200
MISC. EQUIP. RENTAL (See Equipment Schedule)							$278,400	$278,400
PERDIEM / SUBSISTANCE					$76,800			$76,800
TEMPORARY FACILITIES & UTILITIES		532		$10,800		$10,800		$21,600
JOB CLEAN-UP 6%		532		$10,800		$3,600		$14,400
SAFETY 3%		231		$4,700		$2,500		$7,200
HEALTH PHYSICS S/C		1,145		$23,300		$11,000		$34,300
ERCLA - 40 HRs/FTE		760		$15,500				[illegible]
ET/SITE ACCESS & JOB SPECIFIC TRAINING		380		$7,700				$7,700
PAYROLL BURDENS & BENEFITS		-	-	$298,300				$298,300
OVERHEAD & PROFIT		-	-		$248,100			$248,100
BOND		-	-		$14,900			$14,900
SALES TAX		-	-			$3,100	$17,000	$20,100
INDIRECT FIELD COSTS TOTAL		12,540		$580,900	$339,800	$38,200	$295,400	$1,254,300
DIRECT & INDIRECT FIELD COSTS TOTAL		24,367	$33.72	$821,600	$348,000	$54,500	$299,700	$1,523,800
WASTE DISPOSITION - MGMT. - FD FERNALD				$1,431,356	$2,396,284	$3,503,822	$56,950	$7,388,411
WASTE MANAGEMENT COSTS TOTAL				$1,431,400	$2,396,300	$3,503,800	$56,900	$7,388,400
PROJECT MANAGEMENT - FLUOR DANIEL FERNALD				$963,200	$117,300	$26,600		$1,107,100
FIELD PREPARATION								
PROJECT CLOSE OUT				$94,200	$3,100			$97,300
FD-FERNALD FIELD SUPPORT COSTS TOTAL				$1,057,400	$120,400	$26,600		$1,204,400
ENGINEERING, PLANNING, PROCUREMENT - FLUOR DANIEL FERNALD				$123,800	$9,500	$6,700		$140,000
ENGINEERING, PLANNING & PROCUREMENT COSTS TOTAL				$123,800	$9,500	$6,700		$140,000
SALES TAX - FLUOR DANIEL FERNALD						$212,200		$212,200
SUB-TOTAL (BASE ESTIMATE)								$10,468,800
RISK BUDGET 7.0%								$106,700
TARGET ESTIMATE ITEM NO. 7				(FY 99 DOLLARS)				$10,575,500
NTS BURIAL FEE ITEM NO.30								$6,662,514

TIMATE PERFORMED BY ESTIMATING SERVICES

F31238

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost				820						$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System				1,140						$23,100				$23,100
II	RCS Phase I, II, & III				1,743						$35,300				$35,300
III	Silo Waste Retrieval System				2,204						$44,600				$44,600
IV	Transfer Tank Area				4,520						$91,500				$91,500
	Demobilization Cost				1,400						$28,800	$8,200	$2,500	$3,500	$43,000
	Subtotal Direct Cost	1	LOT		11,827						$240,700	$8,200	$16,300	$4,300	$269,500

000565

- 8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Utilities to Building	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		500	20.27			1500	3.50	$10,140		$1,500	$1,800	$13,440
D	Remove Electrical to Trailer	1	lot		120	21.12				300	$2,530			$310	$2,840
D	Remove Utilitries to Building	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000.00			$3,240	$8,220			$11,460
	Total				1,400						$28,800	$8,200	$2,500	$3,500	$43,000

005066

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	Sub Item	Description	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
I		Full Scale Mock-up System					20.25									
D	A	Blower Skid	0.2	tn	150	41	20.25					$830				$830
D	B	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
	C	Waste Retrieval Equipt					20.25									
D		Pipe Bridge from Silo 4 to TTA	15	tn	9	186	20.25					$3,770				$3,770
D		Sluicer Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Deployment Equipment	3	tn	40	165	20.25					$3,340				$3,340
D		Retrieval Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Discrete Object Housing	1.5	tn	40	83	20.25					$1,680				$1,680
D		CATS Housing	1	tn	60	83	20.25					$1,680				$1,680
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
D		Piping	700	lf	0.105	101	20.25					$2,050				$2,050
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		CAmera System	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	104						$2,100				$2,100
		Subtotal Direct Cost		LOTS		1140	20.26					$23,100				$23,100

000567

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II, & III															
D	A	Building - Concrete (380lf	355	cy	1.400	685	20.25					$13,870				$13,870
C	B	Equipt - Carbon Beds	9.2	tn	7	129	20.25					$2,610				$2,610
C		- Fans	0.4	tn	7	6	20.25					$120				$120
C		- HEPA Filters	0.7	tn	7	10	20.25					$200				$200
C		- Chillers	4	tn	7	56	20.25					$1,130				$1,130
C		- Condensate Pumps	0.4	tn	7	6	20.25					$120				$120
C		- Holdup Tank	2	tn	7	28	20.25					$570				$570
C		- Transfer Pump	0.6	tn	7	8	20.25					$160				$160
D		Metal Platform	1	tn	7	10	20.25					$200				$200
D		Ext. Metal Ladder	0.2	tn	7	2	20.25					$40				$40
C	C	Ductwork - HVAC - 8"	400	lf	0.127	102	20.25					$2,070				$2,070
C		- Stack - 24"	150	lf	0.151	45	20.25					$910				$910
C		- Climate Control Unit Htrs	0.6	tn	7	8	20.25					$160				$160
C	D	Electrical - MCC	0.4	tn	7	6	20.25					$120				$120
C		- Local Load Cntr	0.1	tn	7	1	20.25					$20				$20
C		- 480 V SWGR	0.3	tn	7	4	20.25					$80				$80
C		- Lighting	0.1	tn	7	1	20.25					$20				$20
C		- Alarms	0.1	tn	7	1	20.25					$20				$20
C		- Rad Detectors	0.1	tn	7	1	20.25					$20				$20
C		Conduit (small)	500	lf	0.021	21	20.25					$430				$430
C		Cable Trays	100	lf	0.033	7	20.25					$140				$140
		Take-off Allowance			10%	114						$2,300				$2,300
		Subtotal Direct Cost	1	LOT	1.51	1,251	20.22					25,300				$25,300

000568

DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II, & III con't.														
C	E Piping - 4" avg	600	lf	0.053	64	20.25					$1,300				$1,300
D	Concrete Slab @ Grade @1'	111	cy	0.459	70	20.25					$1,420				$1,420
D	Concrete Slab Elevated @ 1'	50	cy	3.603	248	20.25					$5,020				$5,020
D	Coated Concrete Walls 2"	37	cy	0.400	20	20.25					$410				$410
D	Footers	90	cy	0.366	45	20.25					$910				$910
	Take-off Allowance			10%	45						$910				$910
	Subtotal Direct Cost	1	LOT		492	20.33					10,000				$10,000

000569

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III	Silo Waste Retrieval System															
D	A	Pivoting Bridge	11	tn	7	106	20.25					$2,150				$2,150
D	B	Center Foundation	26	cy	0.400	14	20.25					$280				$280
D	C	Curved Plate Foundations	67	cy	0.400	37	20.25					$750				$750
D	D	Structural Truss & Tower	11	tn	7	106	20.25					$2,150				$2,150
D		Tower #2	2	tn	10	28	20.25					$570				$570
D		Curved Plate for Glide Track	12	tn	7	116	20.25					$2,350				$2,350
	E	Retrieval Equipt & Housing:					20.25									
C		- Sluicer Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		- Deployment Equipment	3	tn	40	241	20.25					$4,880				$4,880
C		- Retrieval Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		- Discrete Object Housing	1.5	tn	40	120	20.25					$2,430				$2,430
C		- CATS Housing	1	tn	7	14	20.25					$280				$280
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
C		Piping	700	lf	0.053	74	20.25					$1,500				$1,500
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		Pipe Bridge @35'h w/ 40' spans conc ftg	15	tn	7	145	20.25					$2,940				$2,940
C		RCS Round Duct	600	lf	0.127	153	20.25					$3,100				$3,100
C	F	Transfer Line (Silo to TTA) - 2"	300	lf	0.040	24	20.25					$490				$490
C	G	Air Equipt (for Air Track) - 2"	500	lf	0.040	40	20.25					$810				$810
C		Air Compressor	0.2	tn	7	3	20.25					$60				$60
C	H	Water Supply System 2"	500	lf	0.040	40	20.25					$810				$810
C		Hydraulic Line 2"	200	lf	0.040	16	20.25					$320				$320
D		Conduits	900	lf	0.033	41	20.25					$830				$830
		Take-off Allowance			10%	171						$3,460				$3,460
		Subtotal Direct Cost	1	LOT		1,881	20.26					$38,100				$38,100

000570

DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III	Silo Waste Retrieval System con't.															
D	I	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
D	J	Trailers - Decon	6	tn	7	58	20.25					$1,170				$1,170
D		- Storage	6	tn	7	58	20.25					$1,170				$1,170
D		- Office	6	tn	7	58	20.25					$1,170				$1,170
D		- Break	6	tn	7	58	20.25					$1,170				$1,170
D	L	Camera System	0.4	tn	7	4	20.25					$80				$80
I		Take-off Allowance			10%	29						$590				$590
		Subtotal Direct Cost	1	LOTS		323	20.12					$6,500				$6,500

000571

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
IV	Transfer Tank Area															
C	A	Storage Tanks 66'dia x 30'h	220	tn	2.700	1191	20.25					$24,120				$24,120
C	B	Decant Tank 38'dia x 30'h	34.2	tn	2.700	185	20.25					$3,750				$3,750
D	C	Structure w/Metal Roof	112.5	tn	2.700	418	20.25					$8,460				$8,460
D		w/ 12" concrete Floor	833	cy	0.459	527	20.25					$10,670				$10,670
D		w/ 2' concrete Walls	1600	cy	0.400	882	20.25					$17,860				$17,860
D		w/ 9" R/I conc Slab - Operating Deck (Par	625	cy	0.459	395	20.25					$8,000				$8,000
D		Concrete footers	266	cy	0.368	134	20.25					$2,710				$2,710
D	D	Sampling System Enclosure @2' thick	104	cy	0.400	57	20.25					$1,150				$1,150
D		Slurry Sample & Storage Bldg (3 Walls &	55	cy	0.400	30	20.25					$610				$610
D	E	Raw Water Tank	3.2	tn	3	12	20.25					$240				$240
	F	Mechanical Systems - Pumps														
C		TTA Transfer	0.4	tn	7	6	20.25					$120				$120
C		Makeup Water	0.1	tn	7	1	20.25					$20				$20
C		Sump	0.1	tn	7	1	20.25					$20				$20
C		Sluice	0.1	tn	7	1	20.25					$20				$20
C		HPU Pump	0.1	tn	7	1	20.25					$20				$20
C		Piping	750	lf	0.053	80	20.25					$1,620				$1,620
D	G	Electrical - MCC #2	3	cy	0.459	2	20.25					$40				$40
D	H	Lighting , Conduit	2000	lf	0.033	91	20.25					$1,840				$1,840
D		Cable Tray	500	lf	0.021	14	20.25					$280				$280
D	J	Heat (personal) Unit Htrs	0.4	tn	7	4	20.25					$80				$80
C	K	Ductwork	300	lf	0.127	76	20.25					$1,540				$1,540
C	M	Decant Sump	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	411						$8,320				$8,320
		Subtotal Direct Cost	1	LOT		4,520	20.24					91,500				$91,500

000572

APPEN... "A"

PROJECT:	Silos 1 & 2 Cement Stabilization(FS)	SITE SPECIFIC	DATE: 20-Aug-99
ESTIMATE NO.:	C4981005		ESTIMATOR: J. ELLIS
CLIENT:	DOE	EFFICIENCY / MULTIPLIER ANALYSIS	LOCATION: FERNALD
WBS NO.:	2.1.3.G.P		TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			70.0%	20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
	<— MULTIPLE SHIFTS-											
WORK WEEK							4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK	//// MULTIPLE-SHIFT ////			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK 2ND SHIFT 3RD SHIFT			 3RD SHIFT		2ND SHIFT		OR ONE SHIFT ONLY			 100.0% 100.0%	 3.0% 5.0%	 0.03 0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	87.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 87.4%

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.14

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EFFICIENCY FACTORS

8113

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	14%	14.0
S/T = BASE UNIT MANHOURS		114
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0 / 114
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0 / 114
• PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	4.00%	5	71.00%	81	79.00%	90	147.00%	168	326.00%	372
(AS A MULTIPLIER)/TOTAL HRS	1.04	118.6	1.71	194.9	1.79	204.1	2.47	281.6	4.26	485.6
TOTAL MULTIPLIER w/SITE PROD.	1.1856		1.9494		2.0406		2.8158		4.8564	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

	12.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	49.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.6.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.04	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDITN'L SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING	QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS	QUANTITY	N/A	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)	MINUTES	N/A	15	15	15	15
TOTAL		0	30	30	30	45
MOBILIZATION - ROUND TRIPS	QUANTITY	N/A	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	N/A	15	15	15	15
TOTAL		0	60	60	60	60
COOLDOWNS PER DAY	QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS) 33.33%	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		575	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)

ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

CAPITAL PLANT

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY	Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)			
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	4	0	$0	C / C+/ B	
SUB-TOTAL		22.18	4		$0		
				$/MD =	$0.00		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	4	0	$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	mC
SUB-TOTAL		5.98	4		$0	
				$/MD =	$0.00	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	48	$3,658	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	48	$39,600	C/B
THERMO STRIPS	EA	50.00	6	48	$14,400	C/B
SUB-TOTAL					$57,660	

MAT'L.$'s
$57,700

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)

ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-9
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

--MEDICAL MONITORING --
CAPITAL - PLANT

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	134	536	$21.98	$11,780
ANNUAL PHYSICALS	1	4	134	536	$21.98	$11,780
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	134	134	$21.98	$2,950
SUB-TOTAL						$26,510

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	134	1203	$21.98	$26,450
SUB-TOTAL						$26,450

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	200	2	400	$21.98	$8,800

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	134	0.5896	339

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	0.0%	$6,921,693	$0
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	$6,921,693	$138,400

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$200,200	$57,700	$257,900

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ACTIVITY DURATIONS

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FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO.: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	18-Jul-99	01-Jan-2000	30-Sep-2000	30-Jun-2001	18.0	MONTHS
					0	MONTHS
TOTAL					18.0	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	14.5	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
		01-Jan-2002	03-Jul-2003	01-Jan-2005	36.1	MONTHS
OPERATIONS					36.1	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

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APPENDIX "E"

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)

DATE: 20-Aug-99
ESTIMATE NO: C4981005
ESTIMATOR: J. ELLIS
CLIENT: DOE
LOCATION: FERNALD
WBS NO.: 2.1.3.G.P
PLANT OPERATIONS
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY WKR.SHFT. = 182/WK for 3.50 YR DURATION				
PPE LEVEL C / C+ / B : F/HF M		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	25252	$450,503	C / C+/ B	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	25252	$450,503	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	25252	$24,242	C / C+/ B	
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	25252	$26,262	C / C+/ B	
GLOVE, WORK - DISPOSABL	PR	1.02	4	25252	$103,030	C / C+/ B	
APR CARTRIDGES - DISPOS	PR	11.74	4	25252	$1,185,853	C / C+/ B	
SUB-TOTAL		22.18	4		$2,240,393		
				$/MD =	$88.72		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVER	PR	4.46	4	50505	$901,006	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	50505	$48,485	mC
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	50505	$52,525	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	50505	$206,060	mC
SUB-TOTAL		5.98	4		$1,208,076	
				$/MD =	$23.92	

SUBCONTRACTOR REQUIRE	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR	PR	12.70	6	112.5	$8,573	D/C/B
APR w/HALF FACE MASK - (1	EA	22.30	6	56.25	$7,526	C
APR w/FULL FACE MASK - (1	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	28.125	$23,203	C/B
THERMO STRIPS	EA	50.00	6	11.25	$3,375	C/B
SUB-TOTAL					$42,680	

MAT'L.$'s
$3,491,100

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

APPENDIX "E"

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)

ESTIMATE NO: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PLANT OPERATIONS
--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $	
BASELINE PHYSICALS	1	4	134	536	$21.98	$11,780	
ANNUAL PHYSICALS	4	4	134	2144	$21.98	$47,130	
EXIT (TERMINATION) PHYSIC	1	1	134	134	$21.98	$2,950	
SUB-TOTAL						$61,860	

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $	
BI-MONTHLY BIOASSAY	9	1	134	1203	$21.98	$26,450	
SUB-TOTAL						$26,450	

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s	
11	523	2	1046	$21.98	$23,000	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	OPERATION WORKING DAYS
2500	226	11	0.0044	150	0.66	792

		LABOR $'s THRU SAFETY	LABOR $'s	
WORK DELAYS CAUSED BY	0.0%	$37,496,256	$0	
			LABOR $'s	
WORK DELAYS CAUSED BY	1.0%	$37,496,256	$375,000	

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$486,300	$3,491,100	$3,977,400

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COST IMPACT MATRIX SHEET

Estimate No.: C4981005
Project: Silos 1 & 2 Cement Stabilization(FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 23-Aug-99
Estimator: J. ELLIS
Location: Fernald

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Civil & Excav. All Facilities		Civil & Excav. All Facilities		Civil & Excav. All Facilities		Concrete All Facilities		Concrete All Facilities		Cement Stabiliz.	
$39,022,330	Labor		Material				Labor		Material		PPE (Material)	
Cost	Base $	$434,760	Base $	$75,160	Base $	$0	Base $	$5,072,630	Base $	$1,752,040	Base $	$73,670
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			0%	0%	-1%	10%				
Material Pricing			-1%	10%					-1%	10%	-1%	15%
Contamination	-1%	10%					-1%	10%				
Technology												
Regulations/Laws												
Quantity Variation	-1%	10%	-1%	15%	0%	0%	-1%	10%	0%	10%	-1%	10%
Project Definition	-1%	10%					0%	5%				
Other												
Range - %	-4%	40%	-2%	25%	0%	0%	-3%	35%	-1%	20%	-2%	25%
Range - $	$417,370	$608,664	$73,657	$93,950	$0	$0	$4,920,451	$6,848,051	$1,734,520	$2,102,448	$72,197	$92,088
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Structual Steel - All Facilities		Structual Steel - All Facilities		Arch./Build's/Finishes - All Fac.		Arch./Build's/Finishes - All Fac.		Equipment System 1-94		Equipment System 1-94	
	Labor		Material		Labor		Material		Labor		Equipment	
Cost	Base $	$882,680	Base $	$1,241,540	Base $	$1,826,410	Base $	$1,925,390	Base $	$1,427,710	Base $	$14,264,310
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	15%			-1%	15%			-1%	20%		
Material Pricing			-1%	10%			0%	10%			-1%	20%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation			0%	10%			-1%	10%			-1%	10%
Project Definition	-1%	10%			-1%	15%			-1%	15%	-1%	10%
Other												
Range - %	-2%	25%	-1%	20%	-2%	30%	-1%	20%	-2%	35%	-3%	40%
Range - $	$865,026	$1,103,350	$1,229,125	$1,489,848	$1,789,882	$2,374,333	$1,906,136	$2,310,468	$1,399,156	$1,927,409	$13,836,381	$19,970,034
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

Analyst: _____

Client: _____

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COST IMPACT MATRIX SHEET

Estimate No.: C4981005
Project: Silos 1 & 2 Cement Stabilization(FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 23-Aug-99
Estimator: J. ELLIS
Location: Fernald

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Cement Stabiliz. Piping Labor		Cement Stabiliz. Piping Material		Cement Stabiliz. Instrumentation Labor		Cement Stabiliz. Instrumentation Material		Cement Stabiliz. Electrical Labor		Cement Stabiliz. Electrical Material	
Cost	Base $	$671,350	Base $	$349,230	Base $	$522,920	Base $	$1,702,730	Base $	$3,061,210	Base $	$1,724,930
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			-1%	10%			-1%	10%		
Material Pricing			-1%	15%			0%	15%			-1%	15%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	5%	0%	10%			0%	5%			0%	10%
Project Definition	0%	5%			0%	5%	0%	5%	0%	10%		
Other												
Range - %	-1%	20%	-1%	25%	-1%	15%	0%	25%	-1%	20%	-1%	25%
Range - $	$664,637	$805,620	$345,738	$436,538	$517,691	$601,358	$1,702,730	$2,128,413	$3,030,698	$3,673,452	$1,707,681	$2,156,163
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Cement Stabiliz. Electrical Equipment		Cement Stabiliz. Paint/Insulation Labor		Cement Stabiliz. Paint/Insulation Material							
Cost	Base $	$1,225,690	Base $	$627,930	Base $	$160,140	Base $	$0	Base $	$0	Base $	$0
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			0%	10%								
Material Pricing	-1%	20%			-1%	10%						
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	-1%	10%			0%	5%						
Project Definition	-1%	10%	0%	5%								
Other												
Range - %	-3%	40%	0%	15%	-1%	15%	0%	0%	0%	0%	0%	0%
Range - $	$1,188,822	$1,715,826	$627,930	$722,120	$158,539	$184,161	$0	$0	$0	$0	$0	$0
Distribution	Uniform		U		U							
Correlation Rank												

Analyst: _____

Client: _____

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C.4.6 Project Management Estimate Basis: Chemical Stabilization — Cement-based

C.4.6.1 Introduction

The project management cost estimate is summarized in **Table C.4.6-1**.

The project management cost for the Chemical Stabilization — Cement-based alternative was prepared as detailed estimates based on Silos Project FY98 actuals, and the current Silos Project organizational charts.

TABLE C. 4.6-1
TOTAL PROJECT MANAGEMENT COST

Annual FDF Project Management Cost	$2,113,080
Silos 1 and 2 Remediation Schedule Duration	10 years
Total Project Management Cost	$21,130,800

<END OF PAGE>

C.4.6.2 Estimate Basis

The cost estimate basis for the project management cost of the Chemical Stabilization — Cement-based alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.4.6.2.1 Assumptions

The following general assumptions were used in the preparation of the project management estimates:

1. Costs are expressed in FY99 dollars.
2. FDF project management labor is based on the current Silos Project organizational structure.
3. Throughout the project, FDF project management labor is dedicated 100% to supporting the Silos1 and 2 material full-scale remediation project.
4. Labor cost is based on a 40-hr/week schedule.
5. FDF project management for the Silos 1 and 2 material full-scale remediation project is a level-of-effort support throughout the project duration from FY00 thru FY10.

<END OF PAGE>

C.4.6.2.2 Inclusions

The project management cost estimate includes the following cost elements:

- Project management labor; and
- Project management office supplies.

C.4.6.2.3 Exclusions

The following elements of cost are excluded from the project management cost estimate:

- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc.);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation O&M; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.4.6.2.4 Format and Coding

The project management cost estimates are compiled and summarized into the following cost centers:

- FDF labor; and
- Material .

The following discussion provides a brief description of the cost centers.

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

Material Cost

Material cost is the cost for office supplies.

C.4.6.2.5 Methodology

The following methods were used to prepare the project management cost estimate:

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using Silos Project FY98 actuals and the current Silos Project organizational structure. The FY99 plan labor rates were then applied to the labor resources to obtain the FDF project management labor cost estimate.

Material Cost

The material cost estimate is based on the Silos Project FY98 project management actual material cost.

C.4.6.2.6 References

The following references were used to prepare the project management cost estimate:

- Silos Project Organization Charts, dated July 23, 1999; and
- FY98 12-month spread for control account 4PM1A, "Project Management" from the FEMP project control system.

C.4.6.2.7 Attachment

Detailed project management cost summary for the CHEM1 alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.4.6.I

Project Management Cost Estimate Summary for

Chemical Stabilization — Cement-based

PROJECT: [redacted]s 1 & 2 Cement Stabilization(FS)
ESTIMATE N[redacted]981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: [redacted]ov-99
ESTIMAT[redacted]LLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Project Management	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
23	PROJECT MANAGEMENT														
	Project Manager	1	ea	20,800	20800	100.00					2,080,000				$2,080,000
	Adminstration Assistand	2	ea	20,800	41600	49.00					2,038,400				$2,038,400
	Contract Adminstrator	1	ea	20,800	20800	43.00					894,400				$894,400
	Contract Technical Represent	1	ea	20,800	20800	49.00					1,019,200				$1,019,200
	Site Integration	1	ea	20,800	20800	49.00					1,019,200				$1,019,200
	Environmental Compliance	1	ea	20,800	20800	45.00					936,000				$936,000
	Clerical	2	ea	20,800	41600	23.00					956,800				$956,800
	Quality Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Quality Engineer	2	ea	20,800	41600	44.00					1,830,400				$1,830,400
	Project Controls Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Project Controls Scheduler	1	ea	20,800	20800	42.00					873,600				$873,600
	Project Controls Cost	1	ea	20,800	20800	42.00					873,600				$873,600
	Project Engineering Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Project Engineers	2	ea	20,800	41600	54.50					2,267,200				$2,267,200
	Readiness Coordiinator	1	ea	20,800	20800	42.50					884,000				$884,000
	Training Coordinator	1	ea	20,800	20800	42.50					884,000				$884,000
	Material Cost	1	lot						830,000				830,000		$830,000
	Take-off Allowance														
	Total Cost ITEM NO 23	1	LOT		416,000	$48.80					20,300,800		830,000		$21,130,800

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C.4.7 Waste Disposal Cost Estimate

C.4.7.1 Introduction

The waste disposal costs for the Chemical Stabilization — Cement-based (CHEM1) alternative are summarized in **Table C.4.7-1**.

TABLE C. 4.7-1
WASTE DISPOSAL COST
CHEMICAL STABILIZATION — CEMENT-BASED

Waste Disposal Containers Cost	$ 32,061,450
Transportation Cost	$12,763,800
NTS Burial Cost	$ 9,664,020
Risk Budget	$ 3,161,140
Total Waste Disposal Cost Estimate	$57,650,410

The waste disposal cost estimate for the CHEM1 alternative was prepared based on the waste loading assumptions documented in the **Basis of Design and Description (Appendix G)**, quotes for containers and transportation services, and FY99 NTS volumetric burial fees.

<END OF PAGE>

C.4.7.2 Estimate Basis

The cost estimate basis for the waste disposal cost of the CHEM1 alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.4.7.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY99 dollars.
2. The wasteform produced by the Chemical Stabilization — Cement-based process contains 5% honeycombing airpockets.
3. Waste loading of the cement is 30 wt%.
4. Mode of transportation to the NTS is via truck.
5. Truckload capacity is 42,000 lb.
6. The wasteform produced by the Chemical Stabilization — Cement-based process will have 1% of out of specification cement requiring rework.
7. The treated Silos 1 and 2 material is disposed at the NTS.
8. The treated Silos 1 and 2 material meets the NTS WAC.

C.4.7.2.2 Inclusions

The waste disposal cost estimate includes the following cost elements:

- Shipping containers;
- Shipment of the treated waste via truck to the NTS; and
- Disposal at the NTS.

C.4.7.2.3 Exclusions

The waste disposal cost estimate excludes the following elements:

- Silos 1 and 2 full-scale treatment facility capital cost;
- D&D cost;
- Disposal cost of D&D debris;
- Cost of operation of AWWT and other site support functions (security, fire department, etc.);
- Silos 1 and 2 material full-scale treatment facility O&M cost; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.4.7.2.4 Format and Coding

The waste disposal cost estimate is compiled and summarized into the following cost centers:

- Waste disposal container;
- Transportation;
- NTS burial; and
- Risk budget.

C.4.7.2.4.1 Waste Disposal Container Cost

Waste disposal container costs are the costs for shipping containers and liners.

C.4.7.2.4.2 Transportation Cost

Transportation cost is FDF's cost for transporting the treated Silos 1 and 2 material to the NTS.

C.4.7.2.4.3 NTS Burial Cost

Burial costs are the costs for the burial and management of the material disposed at the NTS.

C.4.7.2.4.4 Risk Budget

Risk budget is added to the estimate for risk and uncertainties associated with waste loading, packaging and transportation.

C.4.7.2.5 Methodology

The methods used to prepare the waste disposal cost estimate are discussed next.

Waste Disposal Container Cost

The shipping container cost estimate is based on quotes of using a container with a high density concrete with wire screen reinforcement. This container does not have the same dimensions as the certified SEG container; but, its cost is assured to be close to the cost of the SEG container because it's similar in design and materials of construction.

Table C.4.7-2 presents a summary of the containers required to dispose the treated Silos 1 and 2 material at the NTS.

TABLE C. 4.7-2
WASTE DISPOSAL CONTAINER SUMMARY

Container	Quantity	Unit Cost	Total Cost
Shipping/disposal	6,078	$5,275	$32,061,450

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Transportation Cost

A total of 3,039 truck shipments (2 containers/truck shipment) is required to transport the treated Silos 1 and 2 material to the NTS. The transportation cost estimate is based on FY99 average shipping costs, via truck, to the NTS. The transportation cost estimate is $4,200 per truck shipment.

NTS Burial Cost

The burial cost estimate is based on the FY99 burial rate negotiated between the FEMP and the NTS. The burial cost estimate is based on a volumetric rate of $7.50 per cubic feet of waste disposed.

Risk Budget

The risk budget was calculated based on the potential risk associated with waste loading, shipping and waste disposal. The risk factor was determined by the FDF team based on historical data and professional judgement (see **Table C.4.4-9**).

C.4.7.2.6 References

- **Basis of Design and Description (Appendix G).**
- *POP Final Report* **(Appendix H, Attachment H3).**

C.4.7.2.7 Attachments

Detailed waste disposal cost summaries for the CHEM1 alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.4.7.I

Waste Disposal Cost Estimate Summary for

Chemical Stabilization — Cement-based

PROJECT. ios 1 & 2 Cement Stabilization(FS)
ESTIMATE NO C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 2-Nov-99
ESTIMATOR J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Waste Disposal	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
22	WASTE DISPOSAL CONT.	6078	ea	1.00					5,275				32,061,450		$32,061,450
30	NTS COSTS	6078	ea	1.00				1,590				$9,664,020			$9,664,020
22	TRANSPORTATION	6078	ea	1.00				2,100				$12,763,800			$12,763,800

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Cement Stabilization
WASTE DISPOSAL

ITEM	BASIS	AMOUNT
NO. OF CONTAINER	6078	
CONTAINER COST	5275	$ 32,061,450.00
TRANSPORTATION	$2100 EACH	$ 12,763,800.00
DISPOSAL	212 CU. FT. EACH @ $7.50/CU. FT.	$ 9,664,020.00
TOTAL		$ 54,489,270.00

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C.4.8 Cost of Money Estimate

C.4.8.1 Cost of Money Analysis

Cost of money is the cost incurred by the Silos 1 and 2 material full-scale remediation contractor to finance the engineering cost, start-up cost, and capital cost. This cost assumes that the contract for the Silos 1 and 2 material full-scale remediation project will be structured similar to the Silo 3 project contract, which shifts the financial liability and risk of the project to the contractor. Thus, the contract requires the contractor to finance engineering, capital, and start-up costs and be reimbursed for these activities on a predetermined, pay-item schedule once operations are successful.

The cost of money in **Table C.4.8-1** was calculated by establishing a contractor's cash output and cash input schedule and applying a finance rate of 8%. The Silos 1 and 2 project remediation schedule in **Figure 3.4-2** was used as the basis for activity durations.

TABLE C. 4.8-1
COST OF MONEY FOR
CHEMICAL STABILIZATION — CEMENT-BASED

Cost of Money	$27,567,063

C.4.8.2 Attachment

The cost of money analysis summary for the CHEM1 alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.4.8.I

Cost of Money Estimate for

Chemical Stabilization — Cement-based

Cement Stabilization

FLUOR DANIEL FERNALD
FULL SCALE REMEDIATION
COST OF MONEY MODEL
SILOS 1 & 2 CEMENT STABILIZATION (7S)
SUBCONTRACTOR "PAY OUT" SCHEDULE

Pay Item Number	Description	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 Dollars)	$24,486,860	$8,162,287	$8,162,287	$8,162,287						
	TOTAL 1.0 (in ESCALATED Dollars)	$27,316,519	$8,850,825	$9,100,463	$9,365,231	$0	$0	$0	$0	$0	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 Dollars)	$50,887,643			$25,443,822	$25,443,822					
	TOTAL 2.0 (in ESCALATED Dollars)	$59,212,729	$0	$0	$29,193,691	$30,019,038	$0	$0	$0	$0	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 Dollars)	$1,164,320				$1,164,320					
	TOTAL 3.0 (in ESCALATED Dollars)	$1,361,886	$0	$0	$0	$1,361,886	$0	$0	$0	$0	$0
4.0	PRE-OPERATIONAL ASSESSMENT										
	TOTAL 4.0 (in 99 Dollars)										
	TOTAL 4.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 Dollars)	$34,333,190					$11,444,397	$11,444,397	$11,444,397	$0	
	TOTAL 5.0 (in ESCALATED Dollars)	$42,903,967	$0	$0	$0	$0	$13,894,734	$14,297,787	$14,711,447	$0	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Dollars)										
	TOTAL 6.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Dollars)	$22,906,700								$22,906,700	
	TOTAL 7.0 (in ESCALATED Dollars)	$30,295,109	$0	$0	$0	$0	$0	$0	$0	$30,295,109	$0
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Dollars)										
	TOTAL 8.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN 99 DOLLARS	$133,768,713	$8,162,287	$8,162,287	$33,606,108	$26,598,142	$11,444,397	$11,444,397	$11,444,397	$22,906,700	$0
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN ESCALATED DOLLARS	$161,090,211	$8,850,825	$9,100,463	$38,558,923	$31,380,924	$13,894,734	$14,297,787	$14,711,447	$30,295,109	$0
			$8,162,287	$16,324,573	$49,930,681	$76,528,823	$87,973,220	$99,417,616	$110,862,013	$133,768,713	$133,768,713

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Cement Stabilization

SUBCONTRACTOR "PAY IN" SCHEDULE

Pay Item Number	Description	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 Dollars)	$24,486,880		$0	$0	$0	$3,121,715	$3,121,715	$12,243,430		
	TOTAL 1.0 (in ESCALATED Dollars)	$30,819,025	$0	$0	$0	$0	$7,432,423	$7,648,020	$15,738,582	$0	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 Dollars)	$50,887,643				$0	$ 12,721,911	$ 12,721,911	$ 25,443,822		
	TOTAL 2.0 (in ESCALATED Dollars)	$64,046,903	$0	$0	$0	$0	$15,445,774	$15,893,819	$32,707,310	$0	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 Dollars)	$1,154,320				$0	$288,580	$288,580	$577,160		
	TOTAL 3.0 (in ESCALATED Dollars)	$1,452,821	$0	$0	$0	$0	$350,367	$360,531	$741,923	$0	$0
4.0	PRE-OPERATIONAL ASSESSMENT										
	TOTAL 4.0 (in 99 Dollars)										
	TOTAL 4.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 Dollars)	$34,333,190					$8,583,298	$8,583,298	$17,166,595	$0	$0
	TOTAL 5.0 (in ESCALATED Dollars)	$43,211,561	$0	$0	$0	$0	$10,421,050	$10,723,340	$22,067,170	$0	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Dollars)										
	TOTAL 6.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Dollars)	$22,906,700								$22,906,700	$0
	TOTAL 7.0 (in ESCALATED Dollars)	$30,295,109	$0	$0	$0	$0	$0	$0	$0	$30,295,109	$0
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Dollars)										
	TOTAL 8.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL FOR "PAY IN" FOR PAY ITEMS IN 99 DOLLARS	$133,768,713	$0	$0	$0	$0	$27,715,503	$27,715,503	$55,431,007	$22,906,700	$0
	TOTAL FOR "PAY IN" FOR PAY ITEMS IN ESCALATED DOLLARS	$169,825,418	$0	$0	$0	$0	$33,649,614	$34,625,710	$71,254,985	$30,295,109	$0
			$0	$0	$0	$0	$27,715,503	$55,431,007	$110,862,013	$133,768,713	$133,768,713

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Cement Stabilization

COST OF MONEY CALCULATION	COST OF MONEY RATE/YR		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
MONTHLY "PAY OUT" AMOUNTS	Prime Rate 8/4/99		$8,162,287	$8,162,287	$33,606,108	$26,598,142	$11,444,397	$11,444,397	$11,444,397	$22,906,700	$0
PLUS - YEARLY COST OF MONEY INCREME	8.00%		0	$652,983	$1,358,205	$4,155,350	$6,615,629	$5,843,191	$5,008,957	$1,890,745	$2,042,005
LESS - YEARLY " PAY IN" AMOUNTS			$0	$0	$0	$0	$27,715,503	$27,715,503	$55,431,007	$22,906,700	$0
OUTSTANDING YEARLY INCREMENTAL VALUES			$8,162,287	$8,815,270	$34,964,313	$30,753,491	($9,655,478)	($10,427,916)	($38,977,653)	$1,890,745	$2,042,005
OUTSTANDING CUMULATIVE VALUES			$8,162,287	$16,977,556	$51,941,869	$82,695,360	$73,039,882	$62,611,966	$23,634,314	$25,525,059	$27,567,063
CUMULATIVE COST OF MONEY FY99		**$ 27,567,063**	**$0**	**$652,983**	**$2,011,187**	**$6,166,537**	**$12,782,166**	**$18,625,356**	**$23,634,314**	**$25,525,059**	**$27,567,063**
CUMULATIVE COST OF MONEY		**$ 90,939,883**									

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C.5.0 CHEMICAL STABILIZATION — OTHER

C.5.1 Cost Estimate Summary: Chemical Stabilization — Other

C.5.1.1 Introduction

The summary cost for the Chemical Stabilization — Other (CHEM2) is $302,461,680 in FY99 dollars as shown in **Table C.5.1-1**.

TABLE C. 5.1-1
SUMMARY COST ESTIMATE FOR
CHEMICAL STABILIZATION — OTHER

Section	Cost Element	Estimated Cost
C.5.2	Capital Cost	$55,664,843
C.5.3	Engineering Cost	$23,808,860
C.5.4	O&M	$82,509,274
C.5.5	D&D Cost	$36,356,603
C.5.6	Project Management Cost	$21,130,800
C.5.7	Waste Disposal Cost	$55,365,750
C.5.8	Cost of Money	$27,625,550
C.5.1	Summary Cost (Un-escalated)	$302,461,680

Supporting information for the Chemical Stabilization — Other (CHEM2) cost estimate elements is provided in **Sections C.5.2** through **C.5.8**.

C.5.1.2 Attachment

The cost estimate summary for Chemical Stabilization — Other (CHEM2), prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.5.1.I

Cost Estimate Summary for

Chemical Stabilization — Other

CONTROL ESTIMATE SUMMARY

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	RISK	LABOR	S/C	MAT'L	EQUIP	TOTAL		
1	PRE-MOBILIZATION - CONTRACTOR	1	LOT								678,000				$678,000	C	% / X
2	CAPITAL Direct/ Indirect Field Cost	1	LS								12,429,693	7,680,500	7,754,550	13,414,700	$41,279,443	C	
3	CONSTRUCTION Management	1	LS								3,728,900				$3,728,900	F	
4	ENGINEERING	1	LS									23,808,860			$23,808,860	C	
5	RISK BUDGET for Capital 14.5%	1	LS							9,978,500					$9,978,500	C	
6	DECONTAMINATION/ DEMOLITION	1	LS									13,972,900			$13,972,900	C	
7	TTA/ RCS (Case B) - D & D	1	LS									10,575,500			$10,575,500	C	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
	SUB-TOTAL - ALL PAY ITEMS	1	LS							9,978,500	16,836,593	56,037,760	7,754,550	13,414,700	$104,022,100		
21	Labor FDF-Operations	3.5	YR								48,378,880				$48,378,880	F	
22	Waste Disposal (PKG & Transport)	6,106	CNT									12,822,600	32,056,500		$44,879,100	F	
22.a	Secondary Waste to OTHER	1	ls									107,921			$107,921	C	
23	Project Management FDF	1	LOT								20,300,800		830,000		$21,130,800	F	
	SUB-TOTAL - FDF SUPPORT ITEMS	1	LS								68,679,680	12,930,521	32,886,500		$114,496,700		
24	Start-up testing	6	MTHS									1,154,320			$1,154,320	C	
25	UTILITY	3.5	YR										3,313,150		$3,313,150	C	
26	SPARE PARTS	3.5	YR										196,230		$196,230	C	
27	Health Physics	3.5	YR								628,100		2,900,900		$3,529,000	C/F	
28	CONSUMABLE	3.5	YR										1,618,030		$1,618,030	C	
29	Subcontractor Oversight (ops & Maint)	3.0	YR									2,208,960			$2,208,960	C	
30	RISK BUDGET 19.0%	1	LS							21,428,460					$21,428,460	C	
	SUB-TOTAL - OPERATION/ MAINT ITEMS	1	LS							21,428,460	628,100	3,363,280	8,028,310		$33,448,150		
	TOTAL CONTRACTOR COSTS OF MONEY											27,625,550			$27,625,550		
	TOTAL CONTRACTOR COSTS - FY99 $'s									31,406,960	86,144,400	99,957,110	48,669,360	13,414,700	$279,592,530		
31	NTS DISPOSAL FEE w/ 8% risk	1	LS							1,694,010		21,175,166			$22,869,200	D	
	TOTAL PROJECT COST	1	LOT							33,100,970	86,144,400	121,132,300	48,669,360	13,414,700	$302,461,730		

C: CONTRACTOR F: FLUOR DANIEL FERNALD G: GCBCTC LABOR O: DOE %: PERCENTAGE of VARIABLE TOTALS T: TIME DEPENDANT V: VOLUME DEPENDANT O: OPERATING EFFIC. APPLIED W: WEIGHT X: FIXED COST

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C.5.2 Capital Cost Estimate Basis: Chemical Stabilization — Other

C.5.2.1 Introduction

The capital cost estimate for the Chemical Stabilization — Other (CHEM2) alternative is summarized in **Table C.5.2-1**.

The capital costs of the CHEM2 alternative were prepared as detailed estimates based on the equipment lists, process and mechanical equipment data sheets, single-line electrical diagrams, architectural sketches, and the plot plan provided in the **Design Basis and Description (Appendix G)** for this alternative.

TABLE C. 5.2-1
CAPITAL COST ESTIMATE FOR CHEMICAL STABILIZATION — OTHER

Section	Cost Element	Estimated Cost
C.5.2.2.4.1	Pre-mobilization	$678,000
C.5.2.2.4.2	DFC	$24,916,343
C.5.2.2.4.3	IFC	$16,363,100
C.5.2.2.4.4	Construction Management	$3,728,900
C.5.2.2.4.5	Risk Budget	$9,978,500
C.5.2.1	Total Capital Cost	$55,664,843

<END OF PAGE>

C.5.2.2 Estimate Basis

The cost estimate basis for the capital cost of the Chemical Stabilization — Other alternative is comprised of the following six sections (**Sections C.5.2.2.1** through **C.5.2.2.6**):

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.5.2.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in the second quarter, 1999 U.S. dollars.
2. Labor costs are based on a 4-day/week, 10-hr/day, 40-hr work week with an adequate supply of skilled labor available in the area.
3. Mission changes or major rework does not occur during the engineering, procurement and construction phases of the project.
4. Machinery, equipment, and bulk materials are purchased in the U.S.
5. Engineered machinery and equipment pricing is obtained from engineering specialists and includes freight to the jobsite.
6. Bulk material pricing is estimated using in-house material pricing data.
7. A site productivity multiplier of 1.186 is applied to estimated installation mhr.
8. A sales tax of 6% is applied to estimated equipment and material dollars.
9. Freight is estimated at 2.5% of equipment and material dollars.

C.5.2.2.2 Inclusions

The capital cost estimate includes the costs of the Chemical Stabilization — Other equipment, process equipment, utility equipment, and the associated buildings and structures.

C.5.2.2.3 Exclusions

The following elements of cost are excluded from the capital cost estimate:

- Silos 1 and 2 material retrieval;
- Silo 3 material retrieval and remediation;
- Capital, start-up, and operating spare parts;
- Start-up costs;
- Expense funded costs;
- Operating costs; and
- D&D costs.

C.5.2.2.4 Format and Coding

The CHEM2 capital cost estimate is compiled and summarized into the following cost centers:

- Pre-mobilization;
- Direct field;
- Indirect field;
- Construction management;
- Risk budget; and
- Contingency.

The following discussion provides a brief description of the cost centers.

C.5.2.2.4.1 Pre-mobilization Costs

Pre-mobilization costs are the costs for development and issuance of project documentation and planning.

C.5.2.2.4.2 Direct Field Costs

DFC are the costs for direct construction of the CHEM2 full-scale treatment facility. These costs include craft labor, bulk materials, machinery, and equipment. The FS estimates are further summarized into the following primary, DFC code accounts:

- A/C 0 – Excavation and Civil Works
- A/C 1 – Concrete
- A/C 2 – Structural Steel
- A/C 3 – Architectural
- A/C 4 – Machinery and Equipment
- A/C 5 – Piping
- A/C 6 – Electrical
- A/C 7 – Instrumentation and Control Systems
- A/C 8 – Paint and Insulation
- A/C AA – Mobilization

<END OF PAGE>

The DFCs for the machinery, equipment, and electrical power distribution accounts are broken down into the following systems:

15 – Feed Preparation
16 – Processor Feed
25 – Container Receipt and Handling
26 – Product Recycle
30 – High Voltage
31 – 480 V Distribution
32 – Standby Power
33 – UPS
40 – Plant and Instrument Air
41 – Breathing Air
44 – Product Additive
50 – Process Water
51 – Portable Water
52 – Fire Water
53 – Cooling Water
56 – Recycle Water
57 – Container Decontamination
61 – Non-Radioactive Waste
63 – Laboratory Waste
64 – Radioactive Waste
73 – Waste Processing Building HVAC
75 – Analytical Laboratory HVAC
76 – Maintenance and Warehouse Facilities HVAC
77 – Miscellaneous Facilities HVAC
80 – Maintenance Equipment
82 – Remote Handling Equipment
83 – RAD Shielding Equipment
84 – Sampling
85 – CCTV
93 – Health Protection
94 – Analytical Laboratory

C.5.2.2.4.3 Indirect Field Costs

IFC are the costs for the direct construction effort. These costs include the following:

- Construction supervision;
- Small tools and consumable supplies;
- Construction equipment rental;
- Temporary construction facilities;
- Temporary utilities;
- Job clean-up;
- Safety training;
- Health physics;
- CERCLA;
- GET/Site access & job specific training;
- Payroll burdens and benefits;
- Overhead and profit;
- Bond; and
- Sales tax.

C.5.2.2.4.4 Construction Management Costs

Construction management costs are costs for construction activities that occur at the FEMP. These costs include construction management labor costs for managing and coordinating the construction activities at the FEMP, and the costs for hooking up and supporting construction temporary trailers, supplies, and utilities.

C.5.2.2.4.5 Risk Budget

Allowance for risks and uncertainties associated with the construction of the plant.

C.5.2.2.5 Methodology

The following assumptions, MTO allowances, and methods are used to prepare the capital cost estimate:

Premobilization

The premobilization costs are activity-based level-of-effort support estimates.

Direct Field Costs

Civil Work

Neat quantities are taken off; a slope of 1.8 to 1 is assumed in all excavation 5'0" below-grade, and a 15% swell factor is used to backfill quantities. Since excavated soils are assumed suitable for backfill, imported backfill material is not included. A disposal site is assumed to be located within one-half mile from the construction site.

Concrete

Neat quantities are taken off and rounded to the nearest ten yards. Fluor standard all-in unit rates per CY are applied to the MTO quantities. The all-in rates include the price of concrete, formwork, reinforcing steel, and embedded accessories. Concrete material pricing is developed from current in-house information.

Structural Steel

Steel quantities are taken off and rounded to the nearest ton. A MTO allowance ranging from 5 to 10 percent is applied:

Light-	Qty + 10%
Medium-	Qty + 7.5%
Heavy-	Qty + 5%
Siding/Decking	Qty + 10%

Steel material pricing is developed from current in-house information.

Architectural

Architectural quantities are developed from the building plan and elevation drawings, and rounded. Unit rates of installation are developed for the various architectural construction tasks. Material pricing is developed from the current in-house information. Various MTO allowances ranging from 1 to 10% are applied to quantities, depending on the type of architectural material.

The estimate contains the following buildings:

Waste Process Building	47,260 SF
Analytical Laboratory	3,024 SF
Warehouse	9,600 SF
Mechanical/Electrical Building	5,100 SF
Control Room	720 SF
Additive Bin Storage Facility	6,864 SF
On-site Storage Building	25,585SF
PPE Trailer	504 SF

HVAC Ductwork

Ductwork is estimated by lb/ft^2 of building area. All ductwork related items are estimated as a percentage of the ductwork cost:

Description	Installation mhr	Material
duct	lb x .057 mhr/lb	$2.14
dampers	15% duct mhr	15% duct matl$
accessories	7% duct mhr	7% duct matl$
supports	20% duct mhr	20% duct matl$
insulation	17% duct mhr	17% duct matl$
test and balance	25% duct mhr	N/A

HVAC equipment is included in the machinery and equipment A/C estimate.

Machinery and Equipment

The machinery and equipment pricing is developed by Engineering from informal vendor quotes and in-house pricing. The pricing includes freight to the jobsite. The equipment installation rates are developed from in-house data, or crew size, duration estimates. The installation mhrs include the setting and testing of the equipment. Routine maintenance is included in the installation rates on an annual basis.

Piping

The piping estimate is developed using two methods: MTO and factoring.

Take-off allowances are made for the following systems:

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- Contaminated water (double encased line from the sumps to its tank).
- Potentially contaminated water (line from the sumps to its tank).
- Fire water loop, hydrants, and branches to the buildings.
- New stormwater system line involving the relocation of an existing line, and the installation of new HDPE.
- Feed lines to the additive storage bins.

Allowances for pipe valves are developed as follows:

- Pumps are assigned 3 ea. – ½" gate (drain) valves.
- Tanks are assigned 2 ea. – 2", 2 ea. – ¾" and 1 ea. – ½" gate (gauge & drain) valve.

Piping costs were factored for the remaining process and utility systems, based on the equipment costs. The factors are based on prior estimates of similar waste processing facilities.

Electrical

The electrical estimate is developed using both a MTO approach and factoring. MTOs for power distribution are prepared by the process/utility system, based on the power load requirements shown in the equipment list and one-line diagrams. A factored approached is taken to develop the remaining electrical bulk wiring for the non-process instruments connect to the DCS, and additional melter wiring requirements. The factors are based on similar waste processing facility estimates. Building lighting and communications estimates are derived on a cost per square feet basis. Area lighting for the plot and building grounding is taken off based on the current plot plans.

Instrumentation

The instrumentation estimate is developed using a combination of take-off and factoring methods. Engineering provides a priced process system instrument list. Conceptual process diagrams are used as a basis to take off the local instrumentation. An allowance for isokinetic monitoring is added for the off-gas and the HVAC stacks. Leak detection is added for the double encased contaminated water lines. An allowance for HVAC controls is added based on the HVAC equipment list. The remaining instrument for the utility systems is factored in lieu of instrument diagrams. The factors are developed based on similar waste processing facility estimates.

Paint

The painting estimate is derived using take-off, allowances, and factoring methods. A MTO approach is used to calculate paint requirements for architectural drywall, doors, concrete floors, wall and ceilings, and tanks and stacks. Paint for pricing is factored with the pipe from the equipment account.

Insulation

The insulation estimate is developed using a take-off approach for architectural insulation, and a factored approach for piping and HVAC duct work requirements.

Indirect Field Costs

Construction Supervision

This element of cost includes the following contractor support staff:

- General Superintendent,
- Superintendent,
- Assistant Superintendent,
- Office Administrator,
- Labor Relations,
- Job Coordinator,
- Safety Engineer,
- Field Office and Material Manager,
- Time and Material Supervisor,
- Chief Timekeeper,
- Field Project Accountant,
- Cost Estimator,
- Civil Engineer,
- Construction Warehouseman,
- Time Keeper,
- Material Man, and
- Construction Accounting Clerk.

Construction supervision is estimated at 17% of direct field labor dollars.

Small Tools and Consumables

The cost of small tools and consumables is estimated at 6% of direct field labor dollars and provides for items valued at $500 or less.

Equipment Rental

This cost includes smaller light construction equipment used during the construction phase of the project. This cost excludes large cranes, which are specifically defined on the construction estimate. Equipment rental is estimated at $3.50 per direct field labor mhrs.

Temporary Facilities

This cost includes temporary buildings/sheds/trailers and warehouses used during the course of construction. It is estimated at 6% of direct field labor dollars (split 50% to indirect labor, 50% to indirect material).

Job Clean-up

Includes housekeeping of site/work areas to maintain a safe, clean work environment. Clean up is estimated at 6% of direct field labor dollars (split 75% to indirect labor, 25% to indirect material).

Safety

This cost includes expenses for contractor joist safety meetings and supplies. Safety is estimated at 3% of direct field labor dollars (split 65% to indirect field labor, and 35% to indirect field material).

Health Physics

This element of cost includes RAD checks, workers' physicals, participation in drug screening, and material costs associated with PPE. Health physicals are estimated on a cost per FTE manpower basis.

CERCLA/SAT

This cost includes site access and RAD training. It is estimated on a cost per FTE basis.

Payroll Burdens and Benefits

This cost element includes FICA payments, FUI, SUI, union benefits, and disability. Payroll Burdens and benefits is calculated at 57% of the sum of direct and indirect field (labor dollars).

Overhead and Profit

This cost includes the contractor's overhead and profit. It is estimated at 20% of direct and IFC.

Bond

This is the contractor's cost to bond the project; it is estimated at 1% of total direct and IFC.

Sales Tax

This cost is calculated at 6% of the total material cost (direct and indirect).

Construction Management

This cost is calculated at 30% of the direct and indirect labor cost.

Risk Budget

Cost risk analysis for capital cost is 14.5%, which is based on the capital risk analysis for the AWR and Silo 3 projects.

C.5.2.2.6 References

Basis of Design and Description (Appendix G).

C.5.2.2.7 Attachment

The capital cost estimate summary for the CHEM 2 alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.5.2.I

Capital Cost Estimate Summary for

Chemical Stabilization — Other

CONTROL ES. .ATE SUMMARY

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	DETAIL - ITEM NO. 1	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
·001	PRE-MOBILIZATION																
	DOCUMENTATION																
	(Fm. Pre-mob. to thru De-mob.) (100% Paymnt upon receipt)																
	FDF AUTHORIZATION to MOBILIZE																
	HEALTH & SAFETY PROGRAM																
	- Accident Prevention Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	- Respirator Program	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	- Heat & Cold Stress Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Substance Abuse Program	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- Fall Protection Plan	1	LS	20.0	20	$75.00					$1,500				$1,500	C	
	- MSDS Documentation	1	LS	40.0	40	$75.00					$3,000				$3,000	C	
	LABOR RELATIONS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WORK FORCE UTILIZATION PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SAFETY ASSESSMENT (CONST.)	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	TURNOVER PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	SYSTEM OPERABILITY TEST REPORT	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	WASTE MANEGMENT PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	HAZOP's REVIEW & REPORT	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	CONSTRUCTION ACCEPTANCE TESTS PLAN	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	TRAINING OF PERSONNEL (Prior to Site Access	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	SAFETY BASIS ASSESSMENT -																
	- Documentation - 6 mo.	1	LS	1040.0	1,040	$75.00					$78,000				$78,000	C	
	- Calculation - 12 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	- PHA - 2 x 6 weeks	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	FDF AUTHORIZATION to OPERATE																
	OPERATIONS PROCEDURES	1	LS	1200.0	1,200	$75.00					$90,000				$90,000	C	
	INSPECTIONS & PERIODIC MAINTENANCE PLA	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	OPERATIONS SAFE WORK PLAN	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	STANDING ORDERS MANUAL	1	LS	480.0	480	$75.00					$36,000				$36,000	C	
	LESSONS PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	
	OPERATOR TRAINING PROGRAM PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000		
	OPERATIONS & MAINTENANCE PLAN	1	LS	240.0	240	$75.00					$18,000				$18,000	C	

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CONTROL ES[illegible]ATE SUMMARY

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

DETAIL ITEM	DETAIL - ITEM NO. 1	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL		
001																	
	CONTRACTORS SUBMITTALS																
	Project Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Engineering Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Configuration Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Records Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	System Eng. Management Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Independ. saftey Review Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Procurement Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Contingency Plan & Emerg. Response	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Environmental Control Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Sampling Plan	1	LS	160.0	160	$75.00					$12,000				$12,000	C	
	Quality Assurance Plan	1	LS	80.0	80	$75.00					$6,000				$6,000	C	
	Schedules	1	LS	1060.0	1,060	$75.00					$79,500				$79,500	C	
																C	
	COST ITEM NO. 1	1	LOT								$678,000				$678,000		

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ESTIMATE SUMMARY SHEET

FLUOR DANIEL FERNALD

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PROJECT:	Silos 1 & 2 Chemical Stabilization (FS)	DATE:	05-Nov-99
ESTIMATE NO.:	C4981004	ESTIMATOR:	J. ELLIS
'ENT:	DOE	LOCATION:	FERNALD
; NO.:	2.1.3.G.P	TASK NO.:	4S11B

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO. 2	AAA-Mobilization	800		$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities	9,040		$198,293		$109,450	$9,800	$317,543
	100 - Concrete All Facilities	97,161		$2,061,800		$1,322,800		$3,384,600
	200 - Structural Steel- All Facilities	15,064		$341,700		$899,000		$1,240,700
	300 - Architectural/Buildings/Finishes-All Fac	33,119		$709,100		$1,361,500		$2,070,600
	400 - Equipment Systems 15 - 94	20,642		$507,600			$10,734,900	$11,242,500
	500 - Piping	12,285		$302,100		$373,100		$675,200
	600 - Electrical	68,200		$1,440,200		$1,067,500	$956,300	$3,464,000
	700 - Instrumentation	5,196		$109,700		$1,316,700		$1,426,400
	800 - Paint / Insulation	11,175		$247,900		$117,300		$365,200
DIRECT FIELD COSTS TOTAL		272,682	$21.92	$5,978,393	$669,600	$6,567,350	$11,701,000	$24,916,343
SUPERVISION - CONTRACTOR		46,355		$1,016,300				$1,016,300
SMALL TOOLS & CONSUMABLES						$358,700		$358,700
MISC. EQUIP. RENTAL							$954,400	$954,400
TEMPORARY FACILITIES		8,180		$179,400		$179,400		$358,800
TEMPORARY UTILITY HOOK-UP		5,317		$116,600		$62,800		$179,400
JOB CLEAN-UP		12,271		$269,000		$89,700		$358,700
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)								
.TH PHYSICS S/C		9,975		$218,700		$57,700		$276,400
.ICLA - 40 HRs/FTE		3,675		$80,600				$80,600
GET/SITE ACCESS & JOB SPECIFIC TRAINING		2,646		$58,000				$58,000
PAYROLL BURDENS & BENEFITS		-	-	$4,512,700				$4,512,700
OVERHEAD & PROFIT		-	-		$6,614,100			$6,614,100
BOND		-	-		$396,800			$396,800
SALES TAX		-	-			$438,900	$759,300	$1,198,200
INDIRECT FIELD COSTS TOTAL		88,419		$6,451,300	$7,010,900	$1,187,200	$1,713,700	$16,363,100
DIRECT & INDIRECT FIELD COSTS TOTAL - ITEM NO.2		361,101	$34.42	$12,429,693	$7,680,500	$7,754,550	$13,414,700	$41,279,443
WASTE DISPOSITION MGMT. - FD FERNALD								
OFF-SITE DISPOSAL COSTS (Commercial)								
WASTE MANAGEMENT COSTS TOTAL								
PROJECT MANAGEMENT - FD FERNALD								
CONSTRUCTION MANAGEMENT - FD FERNALD				$3,728,900				$3,728,900
FD FERNALD FIELD SUPPORT COSTS TOTAL - ITEM NO.3				$3,728,900				$3,728,900
ENGINEERING/DESIGN/INSPECTION - FD FERNALD								
ENGINEERING/DESIGN/INSPECTION - A/E					$23,808,860			$23,808,860
ENGINEERING COSTS TOTAL - ITEM NO. 4					$23,808,860			$23,808,860
SALES TAX - FD FERNALD								
SUB-TOTAL (BASE ESTIMATE)								$68,817,200
RISK BUDGET	14.5%	ITEM NO. 5						$9,978,500
TARGET ESTIMATE			(FY 99 DOLLARS)					$78,795,700
NTINGENCY	8.0%							$5,505,400
S BURIAL FEE								

ESTIMATE PERFORMED BY ESTIMATING SERVICES

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY - CAPITAL ITEM NO. 2	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	AAA-Mobilization				800						$60,000	$669,600			$729,600
	000 - Civil & Excavation All Facilities				9,040						$198,293		$109,450	$9,800	$317,543
	100 - Concrete All Facilities				97,161						$2,061,800		$1,322,800		$3,384,600
	200 - Structural Steel- All Facilities				15,064						$341,700		$899,000		$1,240,700
	300 - Architectural/Buildings/Finishes-All Fac				33,119						$709,100		$1,361,500		$2,070,600
	400 - Equipment Systems 15 - 94				20,642						$507,600			$10,734,900	$11,242,500
	500 - Piping				12,285						$302,100		$373,100		$675,200
	600 - Electrical				68,200						$1,440,200		$1,067,500	$956,300	$3,464,000
	700 - Instrumentation				5,196						$109,700		$1,316,700		$1,426,400
	800 - Paint / Insulation				11,175						$247,900		$117,300		$365,200
	Note: The Process, Utility and ..... Equipment Estimates are based on the Equipment List dated 09-21-99.														
	Subtotal Direct Cost	1	LOT		272,682	$21.92					$5,978,393	$669,600	$6,567,350	$11,701,000	$24,916,343

629060

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	A. RECEIVING & LAYDOWN AREAS														
	1. for EQUIPMENT - 150' x 150' x 1'														
	i. Subgrade Pavement Base	2,500	SY	0.016	47	20.27	0.38			0.68	$950			$1,690	$2,640
	ii. Base Course, 12" deep	2,500	SY	0.017	50	20.27	0.40		8.05	0.52	$1,010		$20,130	$1,310	$22,450
	iii. Stabilization Fabric, 6 oz.	2,500	SY	0.030	89	20.27	0.72		2.45	0.12	$1,800		$6,130	$300	$8,230
	iv. Penetration crushed stone, 4" thk	2,500	SY	0.020	59	20.27	0.48		1.46	0.02	$1,200		$3,650	$50	$4,900
	2. extension of utilities														
	i. Tie-in water supply	1	LS	80.00	95	20.27	1930.00		500.00	2180.00	$1,930		$500	$2,180	$4,610
	ii. Tie-in electrical system	1	LS	80.00	95	20.27	1930.00		500.00	1500.00	$1,930		$500	$1,500	$3,930
	iii. Subgrade pavement base	225	SY	0.016	4	20.27	0.36		2.45	0.12	$80		$550	$30	$660
	iv. Base Course 12" deep	225	SY	0.017	5	20.27	0.44		1.46	0.02	$100		$330		$430
	B. RELOCATE EXISTING ITEMS														
	i. Subgrade Pavement Base	1,000	SY	0.016	19	20.27	0.39			0.68	$390			$680	$1,070
	ii. Base Course, 12" deep	1,000	SY	0.017	20	20.27	0.41		8.05	0.52	$410		$8,050	$520	$8,980
	iii. Stabilization Fabric, 6 oz.	1,000	SY	0.003	4	20.27	0.08		2.45	0.12	$80		$2,450	$120	$2,650
	iv. Penetration crushed stone, 4" thk	1,000	SY	0.002	2	20.27	0.04		1.46	0.02	$40		$1,460	$20	$1,520
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	C. STORMWATER MANAGEMENT														
	1. WASTE PREP BLDG.														
mD	i. Excav. footings,Piers,gradebeams	234	BCY	0.34	80	28.68	9.80			1.28	$2,294			$300	$2,594
mD	ii. Backfill footings,Piers,gradebeams	409	ICY	0.22	90	26.76	5.89			0.98	$2,409			$400	$2,809
	iii. Haul excess to stockpile	156	LCY	0.48	75	22.94	11.03			1.92	$1,721			$300	$2,021
mD	iv. Excav. Interior Wall footings	120	BCY	0.33	40	23.75	7.92			0.83	$950			$100	$1,050
mD	v. Backfill Interior Wall Footings	87	ICY	0.37	32	25.00	9.20			1.15	$800			$100	$900
	vi. Haul excess to stockpile	50	LCY	1.14	57	22.81	26.00			4.00	$1,300			$200	$1,500
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		1,103	$33.90					37,393		43,750	9,800	$90,943

000630

DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Civil & Excavation All Facilities														
	D. Prod. Handl. and Storage Facility														
D	1. Excavate area	17200	CY	0.11	2243	20.27					$45,470				$45,470
D	2. Backfill and compact area	13290	CY	0.15	2363	20.27					$47,900				$47,900
D	3. Install vapor barrier	93430	SF	0.008	886	20.27			0.09		$17,960		$8,620		$26,580
D	4. Haul and dump	6441	CY	0.08	611	20.27					$12,380				$12,380
D	5. Sand bedding	335	CY	0.75	298	20.27			12.00		$6,040		$4,120		$10,160
	E. Site Work														
D	1. Grade, Scarity & Compavt Site	19584	SY	0.03	673	20.27					$13,640				$13,640
D	2. Rough grade & Compact for roads	2604	SY	0.04	117	20.27					$2,370				$2,370
D	3. Spread & Compact crushed Rock for ro	2604	SY	0.02	52	20.27			2.40		$1,050		$6,410		$7,460
D	4. Install asphalt for roads	2122	SY	0.03	63	20.27			8.16		$1,280		$17,750		$19,030
D	5. Repair shoulder for roads	482	SY	0.02	11	20.27					$220				$220
D	6. Final Site Grading	7318	SY	0.01	104	20.27					$2,110				$2,110
D	7. Crushed rock for site	7318	SY	0.02	147	20.27			2.40		$2,980		$18,000		$20,980
D	8. Catch Basins	4	EA	48.00	228	20.27			650		$4,620		$2,670		$7,290
D	9. C.B. Frame and cover	4	EA	5.00	24	20.27			210		$490		$860		$1,350
D	10. Pipe barriers	41	EA	0.75	36	20.27			66		$730		$2,770		$3,500
D	Fencing	208	EA	0.25	62	20.27			19.33		$1,260		$4,120		$5,380
D	Gates	4	EA	4.00	19	20.27			100.00		$390		$410		$800
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		7,937	$20.27					160,900		65,700		$226,600

000631

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	100 - Concrete All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	CONCRETE														
	A. Prod. handl. and Storg. Fac.														
D	1. Install slab on grade	2806	CY	3.7	12309	21.22			85.4		$261,200		$245,620		$506,820
D	2. Install walls	2248	CY	12.2	32516	21.22			176.3		$689,990		$406,230		$1,096,220
D	3. Install structural footings	590	CY	6.7	4687	21.22			109.7		$99,460		$66,340		$165,800
D	4. Install continuous footings	860	CY	5.1	5200	21.22			113.40		$110,340		$99,960		$210,300
D	5. Install equipment foundations	270	CY	8.2	2625	21.22			105.60		$55,700		$29,220		$84,920
D	6. Grout area	330	CF	1.0	391	21.22			3.25		$8,300		$1,100		$9,400
D	7. Tilt-up walls	38232	SF	0.24	10879	21.22			3.61		$230,850		$141,470		$372,320
D	8. Install elevated slab	1063	CY	12.5	15754	21.22			181.50		$334,300		$197,760		$532,060
D	9. Install columns for modular walls	525	CY	18.7	11640	21.22			224.50		$247,000		$120,810		$367,810
D	10. Install concrete		CY	11.9		21.22			142.44						
D	11. Install lumber		BF	0.0		21.22			0.38						
D	12. Install wire mesh		SF	0.1		21.22			3.25						
D	13. Duct footings	6	CY	8.20	58	21.22			105.60		$1,230		$650		$1,880
D	14. Stack base	2	CY	8.20	19	21.22			105.60		$400		$220		$620
D	15. Install guy anchors	8	CY	8.20	78	21.22			105.60		$1,660		$870		$2,530
D	16. Fabricate cover blocks	12	EA	48	688	21.22			919		$14,600		$11,300		$25,900
D	17. Install cover blocks	12	EA	10	142	21.22					$3,010				$3,010
D	18. Stack structure footings	8	EA	6.7	64	21.22			109.7		$1,360		$900		$2,260
D	19. Embedded bolts for box beam	144	EA	0.65	111	21.22			2.16		$2,360		$320		$2,680
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		97,181	$21.22					2,061,800		1,322,800		$3,384,600

000632

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	200 - Structural Steel- All Facilities	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	STRUCTURAL STEEL														
D	1. Install metal roofing	27190	SF	0.008	258	22.68			0.72		$5,850		$20,070		$25,920
D	2. Install light steel	187	TON	25.0	5543	22.68			1750.00		$125,720		$335,430		$461,150
D	3. Install medium steel	95	TON	22.0	2478	22.68			1510.00		$56,200		$147,040		$203,240
D	4. Install heavy steel	104.3	TON	19.0	2350	22.68			1340.00		$53,300		$143,260		$196,560
D	5. Install crane rails	3.81	TON	12.0	54	22.68			880.00		$1,220		$3,440		$4,660
D	6. Install checkered plate	3997	SF	0.11	521	22.68			5.92		$11,820		$24,250		$36,070
D	7. Install ladders	420	LF	0.64	319	22.68			56.50		$7,230		$24,320		$31,550
D	8. Install stairs	197	Riser	2.31	540	22.68			87.50		$12,250		$17,670		$29,920
D	9. Install Handrail	393	LF	0.13	58	22.68			13.45		$1,320		$5,420		$6,740
D	10 Kick plate	393	LF	0.05	23	22.68			3.60		$520		$1,450		$1,970
D	11. Install bin loading lines		LF	0.53		22.68			20.30						
D	12. Install crane rail box beam	11.2	TON	17.30	230	22.68			1657.00		$5,220		$19,020		$24,240
D	13. Install supports for box beam	26	EA	15.00	462	22.68			700.00		$10,480		$18,660		$29,140
D	14. Install crane rail stops	4	PR	4.00	19	22.68			450.00		$430		$1,850		$2,280
D	15. Install Stack structure	8.84	TON	22.00	231	22.68			1510.00		$5,240		$13,680		$18,920
D	17. Install grading	1478	SF	0.15	263	22.68			8.40		$5,960		$12,730		$18,690
D	20. Install davit	2	EA	5.00	12	22.68			700.00		$270		$1,440		$1,710
D	22. Install pre-engineered structure	10800	SF	0.05	640	22.68			5.18		$14,520		$57,340		$71,860
D	23. Install 2-1/2" x 2-1/2" x 1/4" angle iron	174	LF	0.09	19	22.68			3.64		$430		$650		$1,080
D	24. Install sumps	24	EA	26.00	740	22.68			1590.00		$16,780		$39,110		$55,890
D	27. Install ductwork supports	6	EA	10.00	71	22.68			656.00		$1,610		$4,030		$5,640
D	28. Install ductwork to stack	150	LF	1.11	197	22.68			41.64		$4,470		$6,400		$10,870
D	29 Install guy cable	800	LF	0.04	36	22.68			2.16		$820		$1,770		$2,590
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		15,064	$22.68					341,700		899,000		$1,240,700

000633

7-81113

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	300 - Architectural/Buildings/Finishes-All Fac	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	ARCHITECTURAL														
D	1. Install metal stud w/gyp. board	14160	SF	0.051	856	21.41			1.02		$18,330		$14,800		$33,130
D	2. Install vents and drains	51754	SF	0.005	307	21.41			0.35		$6,570		$18,570		$25,140
D	3. Install skirting around trailers	1356	SF	0.1	111	21.41			1.04		$2,380		$1,450		$3,830
D	4. Install siding	80395	SF	0.041	3908	21.41			0.86		$83,670		$70,870		$154,540
D	5. Install roof insulation	27190	SF	0.007	226	21.41			0.44		$4,840		$12,260		$17,100
D	6. Install wall insulation	40200	SF	0.005	238	21.41			0.35		$5,100		$14,420		$19,520
D	7. Install membrane roofing	27190	SF	0.025	806	21.41			1.31		$17,260		$36,510		$53,770
D	8. Install 1/2" fiber board	27190	SF	0.009	290	21.41			0.20		$6,210		$5,570		$11,780
D	9. Install single exterior door 3'x7'	28	EA	8.00	266	21.41			680.00		$5,700		$19,520		$25,220
D	10. Install double ext. door6'x7'	6	EA	14.00	100	21.41			970.00		$2,140		$5,970		$8,110
D	11. Install roll-up door 14' x 14'	10	EA	15.00	178	21.41			14000		$3,810		$143,500		$147,310
D	12. Install single int. door 3'x7'	33	EA	6.00	235	21.41			280.00		$5,030		$9,470		$14,500
D	13. Install double int. door6'x7'	10	EA	12.00	142	21.41			510.00		$3,040		$5,230		$8,270
D	14. Install roof closure	494	LF	0.14	82	21.41			13.15		$1,760		$6,660		$8,420
D	15. Install bldg. communications	94236	SF	0.03	3352	21.41			0.53		$71,770		$51,190		$122,960
D	16. Install seal ext. for roof, wall, & floor	617	LF	0.25	183	21.41			3.50		$3,920		$2,210		$6,130
D	17. Install block and level trailers	9	EA	50.0	534	21.41			13889		$11,430		$128,130		$139,560
D	18. Install cleaning agent	1	LOT	25.0	30	21.41			10700		$640		$10,970		$11,610
D	19. Install coated poly. bldg. cover	41978	SF	0.10	5170	21.41			8.56		$110,690		$368,500		$479,190
D	20. Install pot. cont. wtr. tank shelter	1	LOT	340.00	403	21.41			14100		$8,630		$14,450		$23,080
D	21 install skirting around trailers	1356	SF	0.07	111	21.41			1.04		$2,380		$1,450		$3,830
D	22 fab and install stairs and ramps	1	LOT	120	142	21.41			1574		$3,040		$1,610		$4,650
D	23 Ceiling	100	SF	0.027	3	21.41			0.8		$60		$80		$140
	B.FIRE SPRINKLER SYSTEMS														
D	1. install building sprinklers	89421	SF	0.056	5886	21.41			1.63		$126,020		$149,550		$275,570
D	1. Install double int. door 10'x8'	1	EA	22	26	21.41			975.00		$560		$1,000		$1,560
	C. H.V.A.C.														
D	1. install ductwork galv. stl.	76985	LBS	0.06	5203	21.41			2.14		$111,400		$168,870		$280,270
D	2. install dampers	1	LOT	654.0	775	21.41			24528.0		$16,590		$25,140		$41,730
D	3. install accessories	1	LOT	306.0	363	21.41			11531.0		$7,770		$11,820		$19,590
D	4. install supports	1	LOT	870.0	1031	21.41			32642.0		$22,070		$33,460		$55,530
D	5. install insulation	1	LOT	735.0	871	21.41			27578.0		$18,650		$28,270		$46,920
D	6. Test and Balance	1	LOT	1089.0	1291	21.41					$27,640				$27,640
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		33,119	$21.41					709,100		1,361,500		$2,070,600

000634

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	400 - Equipment Systems 15 - 94	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Machinery and Equipment														
	System Description														
	Mach. & Equip. (forward from M & E detail)														
D	15 - Feed Preparation	1	LOT	890.0	1055	24.59				204200	$25,940			$209,310	$235,250
D	16 - Processor Feed	1	LOT	540.0	640	24.59				144500	$15,740			$148,110	$163,850
D	25 - Container Receipt and Handling	1	LOT	2435.0	2887	24.59				1699500	$70,990			$1,741,990	$1,812,980
D	26 - Product Recycle	1	LOT	1485.0	1761	24.59				896900	$43,300			$919,320	$962,620
D	40 - Plant and Instrument Air	1	LOT	290.0	344	24.59				43500	$8,460			$44,590	$53,050
D	41 - Breathing Air	1	LOT	80.0	95	24.59				217300	$2,340			$222,730	$225,070
D	44 - Product Additive	1	LOT	880.0	1043	24.59				288500	$25,650			$295,710	$321,360
D	56 - Recycle Water	1	LOT	30.0	36	24.59				3200	$890			$3,280	$4,170
D	57 - Container Decontamination	1	LOT	200.0	237	24.59				184500	$5,830			$189,110	$194,940
D	61 - Non-Radioactive Liquid Waste	1	LOT	620.0	735	24.59				122000	$18,070			$125,050	$143,120
D	63 - Laboratory Waste	1	LOT	20.0	24	24.59				600	$590			$620	$1,210
D	64 - Radioactive Liquid Waste	1	LOT	940.0	1114	24.59				195800	$27,390			$200,700	$228,090
D	73 - Product Handling Building HVAC	1	LOT	2180.0	2585	24.59				1018900	$63,570			$1,044,370	$1,107,940
D	75 - Analytical Laboratory HVAC	1	LOT	305.0	362	24.59				61700	$8,900			$63,240	$72,140
D	76 - Maint. & Whse. Facilities HVAC	1	LOT	240.0	285	24.59				16050	$7,010			$16,450	$23,460
D	77 - Misc. Facilities HVAC	1	LOT	110.0	130	24.59				7800	$3,200			$8,000	$11,200
D	80 - Maintenance Equipment	1	LOT	570.0	676	24.59				191200	$16,620			$195,980	$212,600
D	82 - Remote Handling Equipment	1	LOT	2430.0	2881	24.59				3100600	$70,840			$3,178,120	$3,248,960
D	83 - Radiation Shielding Equipment	1	LOT	1715.0	2033	24.59				318400	$49,990			$326,360	$376,350
D	84 - Sampling	1	LOT	320.0	379	24.59				297300	$9,320			$304,730	$314,050
D	85 - CCTV	1	LOT	780.0	925	24.59				307500	$22,750			$315,190	$337,940
D	93 - Health Protection	1	LOT	50.0	59	24.59				5100	$1,450			$5,230	$6,680
D	94 - Analytical Laboratory Equipment	1	LOT	300.0	356	24.59				1148000	$8,750			$1,176,700	$1,185,450
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		20,642	$24.59					507,600			10,734,900	$11,242,500

000635

8113

DETAIL ESTIM.. - WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	500 - Piping	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	**PIPNIG SYSTEMS 15 & 16**														
D	1. Install 1/2" c.s. gate valve	90	EA	1.2	128	24.59			61.5		$3,150		$5,670		$8,820
D	2. Install 3/4" c.s. gate valve	18	EA	1.3	28	24.59			69.75		$690		$1,290		$1,980
D	3. Install 2" c.s. gate valve	18	EA	1.7	36	24.59			207.75		$890		$3,830		$4,720
D	4. Install 1/2" s.s. gate valve	30	EA	1.3	46	24.59			257.25		$1,130		$7,910		$9,040
	FIREWATER PIPING														
D	1. Install 12" std wt cs pipe	1240	LF	0.59	863	24.59			42.65		$21,220		$54,210		$75,430
D	2. Install 8" std. wt. cs. pipe	650	LF	0.41	313	24.59			25.71		$7,700		$17,130		$24,830
D	3. Install 4" std. wt. cs. pipe	1100	LF	0.24	306	24.59			10.92		$7,520		$12,310		$19,830
D	4. Install hydrants	21	EA	4.00	100	24.59			700.00		$2,460		$15,070		$17,530
D	5. Install 4" gate valves	21	EA	4.00	100	24.59			850.00		$2,460		$18,300		$20,760
D	6. Install valve boxes	21	EA	6.00	149	24.59			325.00		$3,660		$7,000		$10,660
D	7. Install 4" post indicator valves	3	EA	8.00	28	24.59			1100.00		$690		$3,380		$4,070
D	8. Install 8" post indicator valves	1	EA	12.00	14	24.59			2750.00		$340		$2,820		$3,160
D	9. Install 12" post indicator valves	1	EA	16.00	19	24.59			5200.00		$470		$5,330		$5,800
	STORM WATER PIPING														
D	1 Relocate 30" line	150	LF	1.3	231	24.59					$5,680				$5,680
D	2 install new (HDPE) drain line	300	LF	0.825	293	24.59			67.51		$7,200		$20,760		$27,960
D	1. Install drain lines line	1500	LF	0.4	699	24.59			8.48		$17,190		$13,040		$30,230
D	2. Install double cont. cs pipe line	2100	LF	0.7	1718	24.59			14.72		$42,250		$31,680		$73,930
D	3. Install piping including valves bulk-other	1	LOT	6085	7214	24.59			149600		$177,390		$153,340		$330,730
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		12,285	$24.59					302,100		373,100		$675,200

000636

CONTRACTOR

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	**LTG- ANAL LAB,PPE,& CONT'L RM**	31178	SF	0.20	7393	21.12			4.30		$156,140		$137,420		$293,560
D	**Install lighting to Whse.main & add. storg**	28320	SF	0.05	1679	21.12			1.08		$35,460		$31,350		$66,810
D	**Install lighting to Warehouse bldg.**	117225	SF	0.08	10424	21.12			1.62		$220,150		$194,650		$414,800
D	**Install electrical bulk for addit. instr.-othe**	1	LOT	45	53	21.12			640		$1,120		$660		$1,780
	Feed Preparation - 15														
D	1. Install 480v pr. & mtr. feeders up to 10hp	7	EA	12.9	107	21.12			181.00		$2,260		$1,300		$3,560
D	2. Install 480v pr. & mtr. feeders 15hp	2	EA	12.9	31	21.12			181.00		$650		$370		$1,020
D	3. Install 480v pr. & mtr. feeders 30hp	1	EA	13.2	16	21.12			164.00		$340		$170		$510
D	4. Install start-stop station fac. sealed	10	EA	2.3	27	21.12			120.00		$570		$1,230		$1,800
D	6. Install 3/4" cond. galv. stl.	4500	FT	0.08	427	21.12			0.95		$9,020		$4,380		$13,400
D	7. Install 1" cond. galv. stl.	500	FT	0.11	65	21.12			1.44		$1,370		$740		$2,110
D	8. Install 3/4"-L-flg. with cover & gasket	90	EA	1.0	107	21.12			9.90		$2,260		$910		$3,170
D	9. Install 1"-L-flg. with cover & gasket	10	EA	1.2	14	21.12			14.50		$300		$150		$450
D	10. Install 3/4" cond. union UNY	36	EA	0.8	34	21.12			7.90		$720		$290		$1,010
D	11. Install 1" cond. union UNY	4	EA	1.0	5	21.12			13.40		$110		$50		$160
D	12. Install 3/4" cond. seal "EYS"	10	EA	0.9	11	21.12			10.00		$230		$100		$330
D	13. Install 1" cond. seal "EYS"	1	EA	1.0	1	21.12			13.40		$20		$10		$30
D	14. Install 3/4" cond. hub	10	EA	0.8	9	21.12			4.40		$190		$50		$240
D	15. Install 1" cond. hub	1	EA	1.0	1	21.12			5.20		$20		$10		$30
D	16. Install 3-#14cntrl. wire, str. cu 600v	5200	FT	0.03	166	21.12			0.21		$3,510		$1,120		$4,630
D	17. Install 3 #12w/ #12 grd. power wire	3640	FT	0.04	155	21.12			0.36		$3,270		$1,340		$4,610
D	18. Install 3#6 w/#8 Grd Power wire	520	FT	0.06	36	21.12			0.85		$760		$450		$1,210
D	20. Install 1/c #14 wire term, 600v	60	EA	0.2	14	21.12			0.20		$300		$10		$310
D	21. Install 1/c #12 wire term, 600v	56	EA	0.2	13	21.12			0.25		$270		$10		$280
D	22. Install 1/c #8 wire term, 600v	2	EA	0.3	1	21.12			0.90		$20				$20
D	23. Install 1/c #6 wire term, 600v	6	EA	0.4	3	21.12			1.00		$60		$10		$70
D	24. Install 1/c #10 wire term, 600v	16	EA	0.2	4	21.12			0.25		$80				$80
D	25. Install 3#10 w/#10 Grd Power wire	1040	FT	0.04	54	21.12			0.48		$1,140		$510		$1,650
D	25. Install 14- #10 mtr. cont. kit, 600v	9	EA	0.5	5	21.12			12.00		$110		$110		$220
D	26. Install 8 - #4 mtr. cont. kit, 600v	1	EA	0.6	1	21.12			21.00		$20		$20		$40
D	27. Install flex cond. conn. assy	69	EA	1.1	90	21.12			14.00		$1,900		$990		$2,890
D	28. Install st. stl. box 20"x20"x6" w/term.	4	EA	10.3	49	21.12			630.00		$1,030		$2,580		$3,610
D	29. Install 3/4" galv. ridg. stl. conduit	1500	FT	0.08	142	21.12			0.95		$3,000		$1,460		$4,460

000637

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	30. Install 1" galv. ridg. stl. conduit	350	FT	0.11	46	21.12			1.44		$970		$520		$1,490
D	31. Install1-1/2" galv. ridg. stl. conduit	320	FT	0.14	53	21.12			2.30		$1,120		$750		$1,870
D	32. Install 2" galv. ridg. stl. conduit	160	FT	0.17	32	21.12			3.08		$680		$510		$1,190
D	33. Install 3/4" "L" ftg. w/cover & gasket	65	EA	1.00	77	21.12			9.90		$1,630		$660		$2,290
D	34. Install 1" "L" ftg. w/cover & gasket	13	EA	1.20	18	21.12			14.50		$380		$190		$570
D	35. Install 1-1/2" "L" ftg. w/cover & gasket	13	EA	2.00	31	21.12			27.00		$650		$360		$1,010
D	36. Install 2" "L" ftg. w/cover & gasket	7	EA	2.50	21	21.12			42.00		$440		$300		$740
D	37. Install 3/4" "T" ftg. w/cover & gasket	72	EA	1.20	102	21.12			11.30		$2,150		$830		$2,980
D	38. Install 1" "T" ftg. w/cover & gasket	13	EA	1.50	23	21.12			16.60		$490		$220		$710
D	39. Install 1-1/2" "T" ftg. w/cover & gasket	13	EA	2.50	39	21.12			30.30		$820		$400		$1,220
D	40. Install 2" "T" ftg. w/cover & gasket	13	EA	3.00	46	21.12			46.30		$970		$620		$1,590
D	41. Install 3/4" conduit union "UNY"	25	EA	0.80	24	21.12			7.90		$510		$200		$710
D	42. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	43. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	44. Install 2" conduit union "UNY"	8	EA	1.90	18	21.12			34.40		$380		$280		$660
D	45. Install 2" conduit hub	4	EA	1.90	9	21.12			11.00		$190		$50		$240
D	46. Install 2" conduit seal "EYS"	4	EA	1.60	8	21.12			30.20		$170		$120		$290
D	47. Install 1/2" conduit drain	50	EA	0.20	12	21.12			25.00		$250		$1,280		$1,530
D	48. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	7400	FT	0.02	158	21.12			0.23		$3,340		$1,740		$5,080
D	49. Install 1pr-#16 wire termination, 300v	138	EA	0.40	65	21.12			0.30		$1,370		$40		$1,410
D	Miscellaneous and support material	1	LOT	198.00	198	21.12			2871.00		$4,180		$2,940		$7,120
	Processor Feed - 16														
D	1. Install 480v pr. & mtr. feeders up to 10hp	9	EA	12.9	138	21.12			182.00		$2,910		$1,680		$4,590
D	2. Install start-stop station fac. sealed	9	EA	2.3	25	21.12			120.00		$530		$1,110		$1,640
D	3. Install 3/4" cond. galv. stl.	4230	FT	0.08	401	21.12			0.95		$8,470		$4,120		$12,590
D	4. Install 3/4" "L" ftg. w/cover & gasket	90	EA	1.00	107	21.12			9.90		$2,260		$910		$3,170
D	5. Install 3/4" conduit union "UNY"	36	EA	0.80	34	21.12			7.90		$720		$290		$1,010
D	6. Install 3/4" conduit seal "EYS"	10	EA	0.90	11	21.12			10.00		$230		$100		$330
D	7. Install 3/4" cond. hub	10	EA	0.80	9	21.12			4.40		$190		$50		$240
D	8. Install control wire 3 #14	4400	FT	0.03	141	21.12			0.21		$2,980		$950		$3,930
D	9. Install power wire 3#12 w/ #12grd.	4400	FT	0.04	188	21.12			0.36		$3,970		$1,620		$5,590
D	10. Install wire term. , 600v, 1/c #14	54	EA	0.20	13	21.12			0.20		$270		$10		$280
D	11. Install wire term. , 600v, 1/c #12	72	EA	0.20	17	21.12			0.25		$360		$20		$380

000638

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Processor Feed - 16														
D	12. Install Mtr. cont. kit, 600v, #14 - #10	9	EA	0.50	5	21.12			12.00		$110		$110		$220
D	Miscellaneous and support material	1	LOT	220.00	220	21.12			3305.00		$4,650		$3,390		$8,040
D	Install 2" "T" ftg. w/cover & gasket	20	EA	3.00	71	21.12			46.30		$1,500		$950		$2,450
D	1. Install flex cond. conn. assy	105	EA	1.1	137	21.12			14.00		$2,890		$1,510		$4,400
D	2. Install st. stl. box 20"x20"x6" w/term.	6	EA	10.3	73	21.12			630.00		$1,540		$3,870		$5,410
D	3. Install 3/4" galv. ridg. stl. conduit	2280	FT	0.08	216	21.12			0.95		$4,560		$2,220		$6,780
D	4. Install 1" galv. ridg. stl. conduit	550	FT	0.11	72	21.12			1.44		$1,520		$810		$2,330
D	5. Install 1-1/2" galv. ridg. stl. conduit	500	FT	0.14	83	21.12			2.30		$1,750		$1,180		$2,930
D	6. Install 2" galv. ridg. stl. conduit	250	FT	0.17	50	21.12			3.08		$1,060		$790		$1,850
D	7. Install 3/4" "L" ftg. w/cover & gasket	100	EA	1.00	119	21.12			9.90		$2,510		$1,010		$3,520
D	8. Install 1" "L" ftg. w/cover & gasket	20	EA	1.20	28	21.12			14.50		$590		$300		$890
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	20	EA	2.00	47	21.12			27.00		$990		$550		$1,540
D	10. Install 2" "L" ftg. w/cover & gasket	10	EA	2.50	30	21.12			42.00		$630		$430		$1,060
D	11. Install 3/4" "T" ftg. w/cover & gasket	110	EA	1.20	156	21.12			11.30		$3,290		$1,270		$4,560
D	12. Install 1" "T" ftg. w/cover & gasket	20	EA	1.50	36	21.12			16.60		$760		$340		$1,100
D	9. Install 3/4" conduit union "UNY"	40	EA	0.80	38	21.12			7.90		$800		$320		$1,120
D	10. Install 1" conduit union "UNY"	8	EA	1.00	9	21.12			13.40		$190		$110		$300
D	11. Install 1/2" conduit drain	75	EA	0.20	18	21.12			25.00		$380		$1,920		$2,300
D	12. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	11200	FT	0.02	239	21.12			0.23		$5,050		$2,640		$7,690
D	13. Install 1pr-#16 wire termination, 300v	210	EA	0.40	100	21.12			0.30		$2,110		$60		$2,170
D	2" Conduit hub	6	EA	1.90	14	21.12			11.00		$300		$70		$370
D	2" Conduit seal "ESY"	6	EA	1.60	11	21.12			30.20		$230		$190		$420
D	12. Install 1-1/2" "T" ftg. w/cover & gasket	20	EA	2.50	59	21.12			30.30		$1,250		$620		$1,870
	Container Receipt & Handling System - 25														
D	1. Install 480v pr. & mtr. feeders up to 10hp	22	LOT	12.9	336	21.12			181.00		$7,100		$4,080		$11,180
D	2. Install push button station	22	EA	2.3	60	21.12			120.00		$1,270		$2,710		$3,980
D	3. Install 3/4" conduit galv. rigid stl.	7300	FT	0.08	692	21.12			0.95		$14,620		$7,110		$21,730
D	4. Install 3/4" "L" ftg. w/cover & gasket	154	EA	1.00	183	21.12			9.90		$3,860		$1,560		$5,420
D	5. Install 3/4" conduit union "UNY"	62	EA	0.80	59	21.12			7.90		$1,250		$500		$1,750
D	6. Install 3/4" conduit seal "EYS"	24	EA	0.90	26	21.12			10.00		$550		$250		$800
D	7. Install 3/4" conduit hub	24	EA	0.80	23	21.12			4.40		$490		$110		$600
D	8. Install power wire 3#12 w/ #12 grd.	7600	FT	0.04	324	21.12			0.36		$6,840		$2,800		$9,640
D	9. Install wire term. 600v, 1/c #12	110	EA	0.20	26	21.12			0.25		$550		$30		$580

000639

81113

DETAIL ESTIM...E WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	10. Install control wire 3 #14	7600	FT	0.03	243	21.12			0.21		$5,130		$1,640		$6,770
D	11. Install wire term. , 600v, 1/c #14	132	EA	0.20	31	21.12			0.20		$650		$30		$680
D	Miscellaneous and support material	1	LOT	173.00	173	21.12			2272.00		$3,650		$2,330		$5,980
D	12. Install motor conn. kit, #14-#10	22	EA	0.50	13	21.12			12.00		$270		$270		$540
	Product Recycle - 26														
D	1. Install 3/4" flex cond. conn. assy	2	EA	0.8	2	21.12			12.05		$40		$20		$60
D	Install motor flex conn to 10 HP	5	EA	12.9	76	21.12			181.00		$1,610		$930		$2,540
D	Install motor flex conn to 100 HP	1	EA	13.2	16	21.12			164.00		$340		$170		$510
D	Install Push button station	8	EA	2.3	22	21.12			120.00		$460		$980		$1,440
D	4. Install 3/4" conduit galv. rigid stl.	2240	FT	0.08	212	21.12			0.95		$4,480		$2,180		$6,660
D	4. Install 1-1/2" conduit galv. rigid stl.	320	FT	0.14	53	21.12			2.30		$1,120		$750		$1,870
D	6. Install 3/4" "L" ftg. w/cover & gasket	49	EA	1.00	58	21.12			9.90		$1,220		$500		$1,720
D	6. Install 1-1/2" "L" ftg. w/cover & gasket	7	FT	2.00	17	21.12			27.00		$360		$190		$550
D	8. Install 3/4" conduit union "UNY"	20	EA	0.80	19	21.12			7.90		$400		$160		$560
D	8. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	10. Install 3/4" conduit seal "EYS"	8	EA	0.90	9	21.12			10.00		$190		$80		$270
D	10. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	12. Install 3/4" conduit hub	8	EA	0.90	9	21.12			4.40		$190		$40		$230
D	12. Install 3/4" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	Install 3#14 Control wire	2700	LF	0.03	86	21.12			0.21		$1,820		$580		$2,400
D	14. Install power wire 3#12 w/ #12 grd.	2010	FT	0.04	86	21.12			0.36		$1,820		$740		$2,560
D	14. Install power wire 3#10 w/ #10 grd.	340	FT	0.04	18	21.12			0.48		$380		$170		$550
D	14. Install power wire 3#2 w/ #4 grd.	340	FT	0.11	46	21.12			3.18		$970		$1,110		$2,080
D	16. Install wire term. 600v, 1/c #14	48	EA	0.20	11	21.12			0.20		$230		$10		$240
D	16. Install wire term. 600v, 1/c #12	33	EA	0.20	8	21.12			0.25		$170		$10		$180
D	16. Install wire term. 600v, 1/c #10	8	EA	0.20	2	21.12			0.25		$40				$40
D	16. Install wire term. 600v, 1/c #4	2	EA	0.40	1	21.12			1.30		$20				$20
D	17. Install wire term. 600v, 1/c #2/0	3	EA	0.80	3	21.12			3.20		$60		$10		$70
D	13. Install #14-#10 Motor conn kit1	5	EA	0.50	3	21.12			12.00		$60		$60		$120
D	13. Install #2-#4/0 Motor conn kit1	1	EA	0.50	1	21.12			30.00		$20		$30		$50
D	Miscellaneous and support material	1	LOT	66.00	66	21.12			948.00		$1,390		$970		$2,360
	High Voltage - 30														
D	30-sg-001/002 Elec Transf switch	1	EA	300.0	356	21.12				150000	$7,520			$153,750	$161,270
D	30-UC-001 Utility Cabinet	1	EA			21.12				w/32-eg-0					

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	30-sg-002 Main Transformer	1	EA	290.0	344	21.12				150000	$7,270			$153,750	$161,020
D	3. Install 3" conduit galv. rigid stl.	60	FT	0.28	20	21.12			6.41		$420		$390		$810
D	4. Install 3" "LBD" ftg. w/cover & gasket	2	EA	4.50	11	21.12			160.50		$230		$330		$560
D	5. Install 3" conduit union "UNY"	2	EA	2.50	6	21.12			76.00		$130		$160		$290
D	6. Install 3" cond. hub	4	EA	2.50	12	21.12			33.30		$250		$140		$390
D	7. Install power wire 3#1/0 w/ #4 grd.	100	FT	0.14	17	21.12			8.11		$360		$830		$1,190
D	8. Install wire term. 600v, 1/c #4	4	EA	0.40	2	21.12			1.30		$40		$10		$50
D	9. Install term. kit 15kv 1/c #1/0	12	EA	4.00	57	21.12			80.00		$1,200		$980		$2,180
D	Miscellaneous and support material	1	LOT	8.00	9	21.12			240.00		$190		$250		$440
	480V Distribution - 31														
D	31-MC-001 & 002 (MCC)	2	EA	160.00	379	21.12				85000	$8,000			$174,250	$182,250
D	31-MC-003 (MCC)	1	EA	160.00	190	21.12				70000	$4,010			$71,750	$75,760
D	31-MC-004 & 005 (MCC)	2	EA	160.00	379	21.12				85000	$8,000			$174,250	$182,250
D	31-MC-006 (MCC)	1	EA	160.00	190	21.12				70000	$4,010			$71,750	$75,760
D	9. Install mini-power xfmr/panel, 30kva	9	EA	50.00	534	21.12			3000.00		$11,280		$27,680		$38,960
D	10. Install 3" galv. ridgid stl. conduit	720	FT	0.28	239	21.12			6.41		$5,050		$4,730		$9,780
D	11. Install 3" conduit union "UNY"	18	EA	2.50	53	21.12			76.00		$1,120		$1,400		$2,520
D	12. Install 3" cond. hub	36	EA	2.50	107	21.12			33.30		$2,260		$1,230		$3,490
D	13. Install power wire 3#350 KCM w1/0 grd	1080	FT	0.20	257	21.12			8.18		$5,430		$9,060		$14,490
D	14. Install 3" "L" ftg. w/cover & gasket	18	EA	4.50	96	21.12			160.50		$2,030		$2,960		$4,990
D	15. Install wire term. 600v, 1/c #0	36	EA	0.7	30	21.12			2.75		$630		$100		$730
D	16. Install wire term. 600v, 1/c #350kcm	108	EA	1.50	192	21.12			6.20		$4,060		$690		$4,750
D	10. Install 1-1/2" galv. ridgid stl. conduit	1770	FT	0.14	294	21.12			2.30		$6,210		$4,170		$10,380
D	11. Install 1-1/2" conduit union "UNY"	26	EA	1.50	46	21.12			27.00		$970		$720		$1,690
D	12. Install 1-1/2" cond. hub	14	EA	1.50	25	21.12			7.90		$530		$110		$640
D	13. Install power wire 3#4w/ #8 grd	1910	FT	0.07	154	21.12			1.15		$3,250		$2,250		$5,500
D	14. Install 1-1/2" "L" ftg. w/cover & gasket	72	EA	2.00	171	21.12			27.00		$3,610		$1,990		$5,600
D	15. Install wire term. 600v, 1/c #8	14	EA	0.3	5	21.12			0.90		$110		$10		$120
D	16. Install wire term. 600v, 1/c #4	42	EA	0.40	20	21.12			1.30		$420		$60		$480
D	27. Install 2" PVC sch40 u/g	1730	FT	0.11	226	21.12			0.77		$4,770		$1,370		$6,140
D	28. Install 2" RSG 90 deg elbow	10	EA	1.20	34	21.12			69.60		$720		$710		$1,430
D	29. Install 2" conduit union "UNY"	10	EA	1.90	23	21.12			34.40		$490		$350		$840
D	30. Install 2" conduit seal "EYS"	5	EA	1.60	9	21.12			30.20		$190		$150		$340

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F-8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	31. Install 2" conduit hub	10	EA	1.90	23	21.12			11.00		$490		$110		$600
D	32. Install power wire 3#4 w/ #8 grd	1830	FT	0.05	115	21.12			1.15		$2,430		$2,160		$4,590
D	33. Install wire term 1/c #8	10	EA	0.30	4	21.12			0.90		$80		$10		$90
D	33. Install wire term 1/c #4	30	EA	0.40	14	21.12			1.30		$300		$40		$340
D	39. Install machine trenching	276	CY	0.30	98	21.12					$2,070				$2,070
D	40. Install backfill	209	CY	0.40	99	21.12					$2,090				$2,090
D	41. Load, haul & dump	110	CY	0.10	13	21.12					$270				$270
D	42. Install concrete ductbanks, type 23	96	CY	3.80	433	21.12			92.00		$9,140		$9,050		$18,190
D	Miscellaneous and support material	1	LOT	157.00	157	21.12			3390.00		$3,320		$3,470		$6,790
	Standby Electrical - 32														
D	1. Install generator 700kw,(32-eg-001)	1	EA	180.0	213	21.12				120000	$4,500			$123,000	$127,500
D	2. Install transfer switch (32-ts-001,002)	2	EA	60.0	142	21.12					$3,000				$3,000
D	3. Install 3" conduit galv. rigid stl.	510	FT	0.28	169	21.12			6.41		$3,570		$3,350		$6,920
D	4. Install 3" "LBD" ftg. w/cover & gasket	18	EA	4.50	96	21.12			160.50		$2,030		$2,960		$4,990
D	5. Install 3" conduit union "UNY"	9	EA	2.50	27	21.12			76.00		$570		$700		$1,270
D	7. Install 3" cond. hub	18	EA	2.50	53	21.12			33.30		$1,120		$610		$1,730
D	8. Install power wire 3#350kcm w/ #1/0 grd	690	FT	0.23	187	21.12			11.51		$3,950		$8,140		$12,090
D	9. Install wire term. 600v, 1/c #10	18	EA	0.70	15	21.12			2.60		$320		$50		$370
D	10. Install wire term. 600v, 1/c #350kcm	54	EA	1.50	96	21.12			6.20		$2,030		$340		$2,370
D	Miscellaneous and support material	1	LOT	42.00	50	21.12			1173.00		$1,060		$1,200		$2,260
	Uninterruptible Power - 33														
D	1. Install uninterruptible power sply(up-33-0	1	EA	140.0	166	21.12				33000	$3,510			$33,830	$37,340
D	2. Install local disc. switch 60a-600v	1	EA	3.5	4	21.12			335.00		$80		$340		$420
D	3. Install 1-1/2" conduit galv. rigid stl.	200	FT	0.14	33	21.12			2.30		$700		$470		$1,170
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	21.12			27.00		$360		$190		$550
D	5. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	6. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	7. Install 1-1/2" cond. hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire 3#4 w/ #8 grd.	215	FT	0.07	17	21.12			1.15		$360		$250		$610
D	9. Install wire term. 600v, 1/c #8	2	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	Miscellaneous and support material	1	LOT	8.00	9	21.12			150.00		$190		$150		$340

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Lighting - 34														
D	1. Install rnd. stl. pole w/2" tenon	20	EA	12.0	285	21.12			910.00		$6,020		$18,660		$24,680
D	2. Install stl. arm w/fittings	12	EA	4.0	57	21.12			160.00		$1,200		$1,970		$3,170
D	3. Install stl. brkt. for floodlights	17	EA	1.00	20	21.12			90.00		$420		$1,570		$1,990
D	4. Install rdwy. fixt. 400w w/lamp	12	EA	3.60	51	21.12			370.00		$1,080		$4,550		$5,630
D	5. Install fldlght fixt. 250w w/lamp	37	EA	3.30	145	21.12			300.00		$3,060		$11,380		$14,440
D	6. Install 1" pvc sch.40 conduit	2300	FT	0.07	191	21.12			0.37		$4,030		$870		$4,900
D	7. Install 1" rsg conduit elbow	44	EA	0.40	21	21.12			17.50		$440		$790		$1,230
D	8. Install 1" sealing hub	44	EA	0.80	42	21.12			14.60		$890		$660		$1,550
D	9. Install 1-1/2" insult. grd. bushing	44	EA	0.80	42	21.12			12.60		$890		$570		$1,460
D	10. Install #2 grd. wire cont. type "KC"	22	EA	0.50	13	21.12			14.80		$270		$330		$600
D	11. Install str. cu 600v, 3#10 w/ #10 grd.	2500	FT	0.04	130	21.12			0.48		$2,750		$1,230		$3,980
D	12. Install str. cu 600v, 3#12 w/ #12 grd.	800	FT	0.04	34	21.12			0.36		$720		$300		$1,020
D	13. Install mach. trench. for lighting	357	CY	0.30	127	21.12					$2,680				$2,680
D	14. Install mach. excav. for lighting	116	CY	0.50	69	21.12					$1,460				$1,460
D	15. Backfill & compact	381	CY	0.40	181	21.12					$3,820				$3,820
D	16. Load, haul & dump	163	CY	0.10	19	21.12					$400				$400
D	17. Install concrete elect. ductbank	126	CY	3.8	568	21.12			92.00		$12,000		$11,880		$23,880
D	18. Install concrete stl. pole footing	18	CY	16.9	361	21.12			176.00		$7,620		$3,250		$10,870
D	Miscellaneous and support material	1	LOT	42.00	50	21.12			2927.00		$1,060		$3,000		$4,060
	Grounding - 35														
D	1. Install grd. well assy.	44	EA	8.0	417	21.12			143.00		$8,810		$6,450		$15,260
D	2. Install grd. test bar assy.	14	EA	7.7	128	21.12			169.00		$2,700		$2,430		$5,130
D	3. Install power transf. grdg.	2	EA	3.60	9	21.12			51.50		$190		$110		$300
D	4. Install switchgear grdg.	2	EA	2.50	6	21.12			56.50		$130		$120		$250
D	5. Install MCC grounding	8	EA	2.50	24	21.12			56.50		$510		$460		$970
D	6. Install storage tank grndg.	20	EA	1.00	24	21.12			17.80		$510		$360		$870
D	7. Install vessel or exch. grdg.	2	EA	2.30	5	21.12			25.40		$110		$50		$160
D	8. Install stl. colm. grdg.	102	EA	1.00	121	21.12			17.80		$2,560		$1,860		$4,420
D	9. Install fence post grdg.	6	EA	1.00	7	21.12			57.20		$150		$350		$500
D	10. Install fence gate grdg.	2	EA	2.70	6	21.12			148.80		$130		$310		$440
D	11. Install miscl. equip. grdg.	10	EA	1.00	12	21.12			17.80		$250		$180		$430
D	12. Install #4/0 to #4/0 "T" weld	60	EA	2.00	142	21.12			10.15		$3,000		$620		$3,620
D	13. Install #4/0 to #2 "T" weld	110	EA	2.00	261	21.12			7.55		$5,510		$850		$6,360

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	14. Install 1/c #2 str. cu grd. wire	2500	FT	0.03	89	21.12			0.49		$1,880		$1,260		$3,140
D	15. Install 1/c #4/o str. cu grd. wire	4500	FT	0.02	107	21.12			1.47		$2,260		$6,780		$9,040
D	16. Install mach. excav. for grd. well	4	CY	0.50	2	21.12					$40				$40
D	17. Install mach. trench. for grd. wire	224	CY	0.3	80	21.12					$1,690				$1,690
D	18. Backfill & compaction	261	CY	0.4	124	21.12					$2,620				$2,620
D	Miscellaneous and support material	1	LOT	58.00	69	21.12			1515.00		$1,460		$1,550		$3,010
	Lightning Protection - 36														
D	1. Install air term. w/ base 3/8" x 10" rf. mtd	50	EA	1.2	71	21.12			25.00		$1,500		$1,280		$2,780
D	2. Install #2/0 str. cu wire	1800	FT	0.03	53	21.12			0.94		$1,120		$1,730		$2,850
D	3. Install #2/0 - #4/0 "T" exothermic weld	10	EA	2.00	24	21.12			7.55		$510		$80		$590
D	Miscellaneous and support material	1	LOT	37.00	44	21.12			791.00		$930		$810		$1,740
	Plant & Instrument Air - 40														
D	1. Install mtr. flex cond. conn. assy. 10hp	1	EA	12.9	15	21.12			181.00		$320		$190		$510
D	2. Install mtr. flex cond. conn. assy. 100hp	1	EA	10.10	12	21.12			187.00		$250		$190		$440
D	3. Install 3/4" sealtite flex conmd w/2 conct.	2	LOT	0.80	2	21.12			12.50		$40		$30		$70
D	4. Install starter & fused disc. switch	2	EA	2.50	6	21.12			150.00		$130		$310		$440
D	5. Install start-stop button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	6. Install 3/4" conduit galv. stl.	520	FT	0.08	49	21.12			0.95		$1,030		$510		$1,540
D	7. Install 1-1/2" conduit galv. stl.	130	FT	0.14	22	21.12			2.30		$460		$310		$770
D	8. Install 3/4" "L" ftg. w/ cover & gasket	20	EA	1.00	24	21.12			9.90		$510		$200		$710
D	9. Install 1-1/2" "LBD" ftg. w/ cover & gaske	3	EA	2.00	7	21.12			27.00		$150		$80		$230
D	10. Install 3/4" conduit union "UNY"	8	EA	0.80	8	21.12			7.90		$170		$60		$230
D	11. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	12. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	13. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	14. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	15. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	16. Install cntrl. wire str. cu 3#14	290	FT	0.03	9	21.12			0.21		$190		$60		$250
D	17. Install power wire str. cu 3#12 w/#12grd	435	FT	0.04	19	21.12			0.36		$400		$160		$560
D	18. Install power wire str. cu 3#2/0 w/#4grd.	145	FT	0.14	25	21.12			3.18		$530		$470		$1,000
D	19. Install wire term. 600v 1/c#14	12	EA	0.20	3	21.12			0.20		$60				$60
D	20. Install wire term. 600v 1/c#12	24	EA	0.20	6	21.12			0.25		$130		$10		$140
D	21. Install wire term. 600v 1/c#4	2	EA	0.40	1	21.12			1.30		$20				$20

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	22. Install wire term. 600v 1/c#2/0	6	EA	1.10	8	21.12			3.20		$170		$20		$190
D	23. Install mtr. cont. kit 600v #14-#10	1	EA	0.50	1	21.12			12.00		$20		$10		$30
D	24. Install mtr. cont. kit 600v #2-#4/0	1	EA	1.00	1	21.12			31.50		$20		$30		$50
D	Miscellaneous and support material	1	LOT	19.00	23	21.12			382.00		$490		$390		$880
	Breathing Air System - 41														
D	1. Install 1-1/2" sealtite flex cond. w/2 cont	2	LOT	1.5	4	21.12			35.70		$80		$70		$150
D	2. Install starter & fused disct. switch	2	EA	3.5	8	21.12			335.00		$170		$690		$860
D	3. Install 1-1/2" conduit galv. rigid stl.	800	FT	0.14	133	21.12			2.30		$2,810		$1,890		$4,700
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	16	EA	2.00	38	21.12			27.00		$800		$440		$1,240
D	5. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	6. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	21.12			23.20		$60		$50		$110
D	7. Install 1-1/2" cond. hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	8. Install power wire 3#4 w/ #8 grd.	830	FT	0.07	67	21.12			1.15		$1,420		$980		$2,400
D	9. Install wire term. 600v, 1/c #8	4	EA	0.30	1	21.12			0.90		$20				$20
D	10. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	11. Install mtr. cont. kit 600v #8-#4	2	EA	0.60	1	21.12			21.00		$20		$40		$60
D	Miscellaneous and support material	1	LOT	29.00	29	21.12			519.00		$610		$530		$1,140
	Product Additive - 44														
D	'INSTALL MOTOR FLEX CONN TO 10 hp	7	EA	12.90	107	21.12			181.00		$2,260		$1,300		$3,560
D	INSTALL PUSH BUTTON STATION	7	EA	2.30	19	21.12			120.00		$400		$860		$1,260
D	3. Install 3/4" sealtite flex conmd w/2 conct	4	EA	0.80	4	21.12			12.05		$80		$50		$130
D	6. Install 3/4" conduit galv. stl.	5020	FT	0.08	476	21.12			0.95		$10,050		$4,890		$14,940
D	8. Install 3/4" "L" ftg. w/ cover & gasket	100	EA	1.00	119	21.12			9.90		$2,510		$1,010		$3,520
D	10. Install 3/4" conduit union "UNY"	40	EA	0.80	38	21.12			7.90		$800		$320		$1,120
D	12. Install 3/4" conduit seal "EYS"	12	EA	0.90	13	21.12			10.00		$270		$120		$390
D	14. Install 3/4" conduit hub	12	EA	0.80	11	21.12			4.40		$230		$50		$280
D	17. Install control wire 3#14	4450	FT	0.03	142	21.12			0.21		$3,000		$960		$3,960
D	18. Install power wire str. cu 3#22 w/#12 grd	5200	FT	0.04	222	21.12			0.36		$4,690		$1,920		$6,610
D	20. Install wire term. 600v 1/c#14	42	EA	0.20	10	21.12			0.20		$210		$10		$220
D	21. Install wire term. 600v 1/c#12	70	EA	0.20	17	21.12			0.25		$360		$20		$380
D	23. Install mtr. cont. kit 600v #14-#10	7	EA	0.50	4	21.12			12.00		$80		$90		$170
D	Miscellaneous and support material	1	LOT	110.00	110	21.12			1364.00		$2,320		$1,400		$3,720

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81113

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Recycle Water Flush - 56														
D	1. Install mtr. flex cond. conn. assy. 15hp	1	EA	12.9	15	21.12			181.00		$320		$190		$510
D	2. Install start-stop button station	1	EA	2.30	3	21.12			120.00		$60		$120		$180
D	3. Install 3/4" conduit galv. stl.	330	FT	0.08	31	21.12			0.95		$650		$320		$970
D	4. Install 3/4" "L" ftg. w/ cover & gasket	6	EA	1.00	7	21.12			9.90		$150		$60		$210
D	5. Install 3/4" conduit union "UNY"	3	EA	0.80	3	21.12			7.90		$60		$20		$80
D	6. Install 3/4" conduit seal "EYS"	1	EA	0.90	1	21.12			10.00		$20		$10		$30
D	7. Install 3/4" conduit hub	1	EA	0.80	1	21.12			4.40		$20				$20
D	8. Install cntrl. wire 600v, 3#14	350	FT	0.03	11	21.12			0.21		$230		$80		$310
D	9. Install power wire 3#10 w/ #10 grd.	350	FT	0.04	18	21.12			0.48		$380		$170		$550
D	10. Install wire term. 600v, 1/c #14	6	EA	0.20	1	21.12			0.20		$20				$20
D	11. Install wire term. 600v, 1/c #10	8	EA	0.20	2	21.12			0.25		$40				$40
D	12. Install mtr. conct. kit, 600v #14-#10	1	EA	0.50	1	21.12			12.00		$20		$10		$30
D	Miscellaneous and support material	1	LOT	8.00	9	21.12			106.00		$190		$110		$300
	Container Decon System - 57														
D	Motor flex conn 20 HP	2	EA	13.20	31	21.12			164.00		$650		$340		$990
D	Push button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	1" Sealtite flex cond	2	LOT	1.10	3	21.12			18.50		$60		$40		$100
D	Disconnect switch,6oA,600V	2	EA	3.50	8	21.12			335.00		$170		$690		$860
D	1" Galv rigid cond	1400	FT	0.11	183	21.12			1.44		$3,860		$2,070		$5,930
D	1" "L" Ftg with gasket & cover	28	EA	1.20	40	21.12			14.50		$840		$420		$1,260
D	1" Conduit union "UNY"	12	EA	1.00	14	21.12			13.40		$300		$160		$460
D	1" Conduit seal "EYS"	4	EA	1.00	5	21.12			13.00		$110		$50		$160
D	1" Conduit hub	4	EA	1.00	5	21.12			5.20		$110		$20		$130
D	Control wire 3#14	730	FT	0.03	23	21.12			0.21		$490		$160		$650
D	Power wire 3#8 w/ #10 grd	730	FT	0.05	46	21.12			0.60		$970		$450		$1,420
D	Power wire 3#6 w/ #8 grd	730	FT	0.06	51	21.12			0.85		$1,080		$640		$1,720
D	Wire termination 1c /#14	12	EA	0.20	3	21.12			0.20		$60				$60
D	Wire termination 1c /#10	4	EA	0.20	1	21.12			0.25		$20				$20
D	Wire termination 1c /#8	10	EA	0.30	4	21.12			0.90		$80		$10		$90
D	Wire termination 1c /#6	12	EA	0.40	6	21.12			1.00		$130		$10		$140
D	Motor connection Kit	2	EA	0.60	1	21.12			21.00		$20		$40		$60
D	Miscellaneous and support material	1	LOT	40.00	47	21.12			567.00		$990		$580		$1,570

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Non-Radioactive Waste System - 61														
D	1. Install mtr. flex cond. conn. assy. 10hp	10	EA	12.9	153	21.12			181.00		$3,230		$1,860		$5,090
D	2. Install start-stop button station	10	EA	2.30	27	21.12			120.00		$570		$1,230		$1,800
D	3. Install 3/4" conduit galv. stl.	3500	FT	0.08	332	21.12			0.95		$7,010		$3,410		$10,420
D	4. Install 3/4" "L" ftg. w/ cover & gasket	70	EA	1.00	83	21.12			9.90		$1,750		$710		$2,460
D	5. Install 3/4" conduit union "UNY"	30	EA	0.80	28	21.12			7.90		$590		$240		$830
D	6. Install 3/4" conduit seal "EYS"	11	EA	0.90	12	21.12			10.00		$250		$110		$360
D	7. Install 3/4" conduit hub	11	EA	0.80	10	21.12			4.40		$210		$50		$260
D	8. Install cntrl. wire 600v, 3#14	3650	FT	0.03	117	21.12			0.21		$2,470		$790		$3,260
D	9. Install power wire 3#12 w/ #12 grd.	3650	FT	0.04	190	21.12			0.36		$4,010		$1,350		$5,360
D	10. Install wire term. 600v, 1/c #14	60	EA	0.20	14	21.12			0.20		$300		$10		$310
D	11. Install wire term. 600v, 1/c #12	80	EA	0.20	19	21.12			0.25		$400		$20		$420
D	12. Install mtr. conct. kit, 600v #14-#10	10	EA	0.50	6	21.12			12.00		$130		$120		$250
D	Miscellaneous and support material	1	LOT	82.00	82	21.12			1075.00		$1,730		$1,100		$2,830
	Radioactive Waste System - 64														
D	1. Install mtr. flex cond. conn. assy. 10hp	14	EA	12.9	214	21.12			181.00		$4,520		$2,600		$7,120
D	2. Install start-stop button station	14	EA	2.30	38	21.12			120.00		$800		$1,720		$2,520
D	3. Install 3/4" conduit galv. stl.	4900	FT	0.08	465	21.12			0.95		$9,820		$4,770		$14,590
D	4. Install 3/4" "L" ftg. w/ cover & gasket	98	EA	1.00	116	21.12			9.90		$2,450		$990		$3,440
D	5. Install 3/4" conduit union "UNY"	42	EA	0.80	40	21.12			7.90		$840		$340		$1,180
D	6. Install 3/4" conduit seal "EYS"	15	EA	0.90	16	21.12			10.00		$340		$150		$490
D	7. Install 3/4" conduit hub	15	EA	0.80	14	21.12			4.40		$300		$70		$370
D	8. Install cntrl. wire 600v, 3#14	5110	FT	0.03	164	21.12			0.21		$3,460		$1,100		$4,560
D	9. Install power wire 3#12 w/ #12 grd.	5110	FT	0.04	267	21.12			0.36		$5,640		$1,890		$7,530
D	10. Install wire term. 600v, 1/c #14	84	EA	0.20	20	21.12			0.20		$420		$20		$440
D	11. Install wire term. 600v, 1/c #12	112	EA	0.20	27	21.12			0.25		$570		$30		$600
D	12. Install mtr. conct. kit, 600v #14-#10	14	EA	0.50	8	21.12			12.00		$170		$170		$340
D	Miscellaneous and support material	1	LOT	116.00	116	21.12			1505.00		$2,450		$1,540		$3,990
	Product Handling Bldg. HVAC - 73														
D	Motor flex conn 15 hp, 20hp	5	EA	12.90	76	21.12			181.00		$1,610		$930		$2,540
D	Motor flex conn 30 hp	4	EA	13.20	63	21.12			164.00		$1,330		$670		$2,000
D	Push button station	11	EA	2.30	30	21.12			120.00		$630		$1,350		$1,980
D	Disconnecr Switch,400A,600V	1	EA	8.90	11	21.12			1050.00		$230		$1,080		$1,310
D	Disconnecr Switch,60A,600V	1	EA	3.50	4	21.12			335.00		$80		$340		$420
D	Disconnecr Switch,200A,600V	1	EA	6.20	7	21.12			510.00		$150		$520		$670

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Install mtr. cont. kit, 600V, #14-#10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
D	Disconnecr Switch,60A,600V	2	EA	13.30	32	21.12			1800.00		$680		$3,690		$4,370
D	Disconnecr Switch,200A,600V	2	EA	20.00	47	21.12			5100.00		$990		$10,460		$11,450
D	Motor flex conn 60 hp	2	EA	15.90	38	21.12			247.00		$800		$510		$1,310
D	1. Install 3/4" flex cond. w/ 2 conncectors	1	LOT	0.8	1	21.12			12.05		$20		$10		$30
D	3. Install 1-1/2" flex cond. w/2 connectors	7	LOT	2.00	17	21.12			61.80		$360		$440		$800
D	3. Install 3" flex cond. w/2 connectors	6	LOT	3.50	25	21.12			334.00		$530		$2,050		$2,580
D	5. Install 3/4" conduit galv. rigid stl.	1200	FT	0.08	114	21.12			0.95		$2,410		$1,170		$3,580
D	6. Install 1" conduit galv. rigid stl.	2800	FT	0.11	365	21.12			1.44		$7,710		$4,130		$11,840
D	7. Install 1-1/2" conduit galv. rigid stl.	800	FT	0.14	133	21.12			2.30		$2,810		$1,890		$4,700
D	8. Install 2" conduit galv. rigid stl.	2800	FT	0.17	564	21.12			3.08		$11,910		$8,840		$20,750
D	7. Install 3" conduit galv. rigid stl.	2400	FT	0.28	797	21.12			6.41		$16,830		$15,770		$32,600
D	8. Install 3/4" "L" ftg. w/cover & gasket	24	EA	1.00	28	21.12			9.90		$590		$240		$830
D	9. Install 1" "L" ftg. w/cover & gasket	56	EA	1.20	80	21.12			14.50		$1,690		$830		$2,520
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	16	EA	2.00	38	21.12			27.00		$800		$440		$1,240
D	11. Install 2" "L" ftg. w/cover & gasket	56	EA	2.50	166	21.12			54.00		$3,510		$3,100		$6,610
D	12. Install 3" "L" ftg. w/cover & gasket	48	EA	4.50	256	21.12			160.00		$5,410		$7,870		$13,280
D	13. Install 3/4" conduit union "UNY"	9	EA	0.80	9	21.12			7.90		$190		$70		$260
D	14. Install 1" conduit union "UNY"	21	EA	1.00	25	21.12			13.40		$530		$290		$820
D	15. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	21.12			26.70		$230		$160		$390
D	16. Install 2" conduit union "UNY"	21	EA	1.90	47	21.12			34.40		$990		$740		$1,730
D	17. Install 3" conduit union "UNY"	18	EA	2.50	53	21.12			76.00		$1,120		$1,400		$2,520
D	18. Install 3/4" conduit seal "EYS"	3	EA	0.90	3	21.12			10.00		$60		$30		$90
D	19. Install 1" conduit seal "EYS"	7	EA	1.00	8	21.12			13.00		$170		$90		$260
D	20. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	21.12			23.20		$60		$50		$110
D	21. Install 2" conduit seal "EYS"	7	EA	1.60	13	21.12			30.20		$270		$220		$490
D	22. Install 3" conduit seal "EYS"	6	EA	2.10	15	21.12			59.40		$320		$370		$690
D	23. Install 3/4" conduit hub	3	EA	0.80	3	21.12			4.40		$60		$10		$70
D	24. Install 1" conduit hub	7	EA	1.00	8	21.12			5.20		$170		$40		$210
D	25. Install 1-1/2" conduit hub	2	EA	1.50	4	21.12			7.90		$80		$20		$100
D	26. Install 2" conduit hub	7	EA	1.90	16	21.12			11.00		$340		$80		$420
D	27. Install 3" conduit hub	6	EA	2.50	18	21.12			33.30		$380		$200		$580
D	20. Install control wire 3#14	4620	FT	0.03	148	21.12			0.21		$3,130		$990		$4,120
D	20. Install power wire 3#8 w/ #10 grd.	1680	FT	0.05	106	21.12			0.60		$2,240		$1,030		$3,270

00064B

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	31. Install mtr. cont. kit, 600V, #2-#4/0	2	EA	1.00	2	21.12			31.50		$40		$60		$100
D	21. Install power wire 3#12 w/ #12 grd.	840	FT	0.08	77	21.12			1.76		$1,630		$1,520		$3,150
D	23. Install power wire 3#500w/ #1/0 grd.	2520	FT	0.20	601	21.12			8.18		$12,690		$21,130		$33,820
D	21. Install power wire 3#12 w/ #12 grd.	840	FT	0.04	36	21.12			0.48		$760		$410		$1,170
D	22. Install power wire 3#2/0 w/ #4 grd.	1680	FT	0.59	1175	21.12			0.85		$24,820		$1,460		$26,280
D	23. Install power wire 3#500w/ #1/0 grd.	2940	FT	0.15	512	21.12			5.33		$10,810		$16,060		$26,870
D	24. Install wire term. 600v, 1/c #14	66	EA	0.20	16	21.12			0.20		$340		$10		$350
D	25. Install wire term. 600v, 1/c #12	24	EA	0.20	6	21.12			0.25		$130		$10		$140
D	26. Install wire term. 600v, 1/c #6	24	EA	0.40	11	21.12			1.00		$230		$20		$250
D	27. Install wire term. 600v, 1/c #8	36	EA	0.30	13	21.12			0.90		$270		$30		$300
D	28. Install wire term. 600v, 1/c #1/0	12	EA	0.70	10	21.12			2.75		$210		$30		$240
D	29. Install wire term. 600v, 1/c #500	36	EA	1.50	64	21.12			6.20		$1,350		$230		$1,580
D	28. Install wire term. 600v, 1/c #2/0	26	EA	0.50	15	21.12			2.45		$320		$70		$390
D	27. Install wire term. 600v, 1/c #4	42	EA	1.10	55	21.12			2.75		$1,160		$120		$1,280
D	31. Install mtr. cont. kit, 600V, #8- #4	7	EA	0.60	5	21.12			21.00		$110		$150		$260
D	Miscellaneous and support material	1	LOT	457.00	457	21.12			11463		$9,650		$11,750		$21,400
	Analytical Lab. HVAC System - 75														
D	Motor flex conn to 10 hp	2	EA	12.90	31	21.12			181.00		$650		$370		$1,020
D	Push button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	Disconnect switch.30a.600v	11	EA	2.50	33	21.12			150.00		$700		$1,690		$2,390
D	Disconnect switch.60a.600v	1	EA	3.50	4	21.12			335.00		$80		$340		$420
D	1. Install 3/4" flex cond. w/ 2 conncectors	11	LOT	0.8	10	21.12			12.05		$210		$140		$350
D	2. Install 1-1/2" flex cond. w/2 connectors	1	LOT	1.50	2	21.12			35.70		$40		$40		$80
D	4. Install 3/4" conduit galv. rigid stl.	3250	FT	0.08	308	21.12			0.95		$6,500		$3,160		$9,660
D	5. Install 1-1/2" conduit galv. rigid stl.	250	FT	0.14	41	21.12			2.30		$870		$590		$1,460
D	6. Install 3/4" "L" ftg. w/cover & gasket	65	EA	1.00	77	21.12			9.90		$1,630		$660		$2,290
D	7. Install 1-1/2" "L" ftg. w/cover & gasket	5	EA	2.00	12	21.12			27.00		$250		$140		$390
D	8. Install 3/4" conduit union "UNY"	26	EA	0.80	25	21.12			7.90		$530		$210		$740
D	9. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	10. Install 3/4" conduit seal "EYS"	14	EA	0.90	15	21.12			10.00		$320		$140		$460
D	11. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	12. Install 3/4" conduit hub	14	EA	0.80	13	21.12			4.40		$270		$60		$330
D	13. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	14. Install controlr wire 3#14	540	FT	0.03	17	21.12			0.21		$360		$120		$480

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	14. Install power wire 3#10 w/ #10 grd.	1620	FT	0.04	85	21.12			0.48		$1,800		$800		$2,600
D	15. Install power wire 3#12 w/ #12 grd.	1890	FT	0.04	81	21.12			0.36		$1,710		$700		$2,410
D	16. Install power wire 3#2 w/ #8 grd.	270	FT	0.08	25	21.12			1.66		$530		$460		$990
D	17. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	18. Install wire term. 600v, 1/c #12	50	EA	0.20	12	21.12			0.25		$250		$10		$260
D	19. Install wire term. 600v, 1/c #10	48	EA	0.20	11	21.12			0.25		$230		$10		$240
D	20. Install wire term. 600v, 1/c #8	2	EA	0.40	1	21.12			1.00		$20				$20
D	20. Install wire term. 600v, 1/c #2	6	EA	0.50	4	21.12			2.45		$80		$20		$100
D	Motor connection kit #14-#10	2	EA	0.50	1	21.12			12.00		$20		$20		$40
D	Miscellaneous and support material	1	LOT	79.00	79	21.12			1124.00		$1,670		$1,150		$2,820
	Maint. & Warehouse Fac. HVAC - 76														
D	1. Install 3/4" flex cond. w/ 2 conncectors	14	LOT	0.8	13	21.12			12.05		$270		$170		$440
D	Disconnect switch.30a.600v	14	EA	2.50	41	21.12			150.00		$870		$2,150		$3,020
D	4. Install 3/4" conduit galv. rigid stl.	5200	FT	0.08	493	21.12			0.95		$10,410		$5,060		$15,470
D	6. Install 3/4" "L" ftg. w/cover & gasket	112	EA	1.00	133	21.12			9.90		$2,810		$1,140		$3,950
D	8. Install 3/4" conduit union "UNY"	45	EA	0.80	43	21.12			7.90		$910		$360		$1,270
D	10. Install 3/4" conduit seal "EYS"	15	EA	0.90	16	21.12			10.00		$340		$150		$490
D	12. Install 3/4" conduit hub	15	EA	0.80	14	21.12			4.40		$300		$70		$370
D	14. Install power wire 3#8 w/ #10 grd.	2730	FT	0.05	172	21.12			0.60		$3,630		$1,680		$5,310
D	15. Install power wire 3#12 w/ #12 grd.	2730	FT	0.04	117	21.12			0.36		$2,470		$1,010		$3,480
D	16. Install wire term. 600v, 1/c #12	56	EA	0.20	13	21.12			0.20		$270		$10		$280
D	17. Install wire term. 600v, 1/c #10	14	EA	0.20	3	21.12			0.25		$60				$60
D	18. Install wire term. 600v, 1/c #8	42	EA	0.25	12	21.12			0.90		$250		$40		$290
D	Miscellaneous and support material	1	LOT	107.00	107	21.12			1402.00		$2,260		$1,440		$3,700
	Misc. Fac. HVAC System - 77														
D	1. Install 3/4" flex cond. w/ 2 conncectors	9	LOT	0.8	9	21.12			12.05		$190		$110		$300
D	Disconnect switch.30a.600v	9	EA	2.50	27	21.12			150.00		$570		$1,380		$1,950
D	4. Install 3/4" conduit galv. rigid stl.	3600	FT	0.08	341	21.12			0.95		$7,200		$3,510		$10,710
D	6. Install 3/4" "L" ftg. w/cover & gasket	72	EA	1.00	85	21.12			9.90		$1,800		$730		$2,530
D	8. Install 3/4" conduit union "UNY"	29	EA	0.80	28	21.12			7.90		$590		$230		$820
D	10. Install 3/4" conduit seal "EYS"	10	EA	0.90	11	21.12			10.00		$230		$100		$330
D	12. Install 3/4" conduit hub	10	EA	0.80	9	21.12			4.40		$190		$50		$240

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	14. Install power wire 3#8 w/ #10 grd.	2520	FT	0.05	158	21.12			0.60		$3,340		$1,550		$4,890
D	15. Install power wire 3#12 w/ #12 grd.	1260	FT	0.04	54	21.12			0.36		$1,140		$460		$1,600
D	16. Install wire term. 600v, 1/c #12	24	EA	0.20	6	21.12			0.20		$130				$130
D	17. Install wire term. 600v, 1/c #10	12	EA	0.20	3	21.12			0.25		$60				$60
D	18. Install wire term. 600v, 1/c #8	36	EA	0.25	11	21.12			0.90		$230		$30		$260
D	Miscellaneous and support material	1	LOT	74.00	74	21.12			968.00		$1,560		$990		$2,550
	Maintenance Equipment - 80														
D	Weld Recept,480v,60a	1	EA	6.00	7	21.12			475.00		$150		$490		$640
D	Weld recept mtg assy	1	EA	3.00	4	21.12			33.00		$80		$30		$110
D	1. Install 3/4" flex cond. w/ 2 conncectors	4	LOT	0.8	4	21.12			12.05		$80		$50		$130
D	2. Install 1" flex cond. w/ 2 conncectors	2	LOT	1.1	3	21.12			18.50		$60		$40		$100
D	Disconnect switch.30a.600v	2	EA	2.50	6	21.12			150.00		$130		$310		$440
D	Disconnect switch.60a.600v	2	EA	3.50	8	21.12			335.00		$170		$690		$860
D	Push button station	2	EA	2.30	5	21.12			120.00		$110		$250		$360
D	5. Install 3/4" conduit galv. rigid stl.	1600	FT	0.08	152	21.12			0.95		$3,210		$1,560		$4,770
D	6. Install 1" conduit galv. rigid stl.	800	FT	0.11	104	21.12			1.44		$2,200		$1,180		$3,380
D	7. Install 1-1/2" conduit galv. rigid stl.	400	FT	0.14	66	21.12			2.30		$1,390		$940		$2,330
D	8. Install 3/4" "L" ftg. w/cover & gasket	32	EA	1.00	38	21.12			9.90		$800		$320		$1,120
D	9. Install 1" "L" ftg. w/cover & gasket	16	EA	1.20	23	21.12			14.50		$490		$240		$730
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	8	EA	2.00	19	21.12			27.00		$400		$220		$620
D	11. Install 3/4" conduit union "UNY"	12	EA	0.80	11	21.12			7.90		$230		$100		$330
D	12. Install 1" conduit union "UNY"	6	EA	1.00	7	21.12			13.40		$150		$80		$230
D	13. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	21.12			26.70		$110		$80		$190
D	14. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	15. Install 1" conduit seal "EYS"	2	EA	1.00	2	21.12			13.00		$40		$30		$70
D	16. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	21.12			23.20		$40		$20		$60
D	17. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	18. Install 1" conduit hub	2	EA	1.00	2	21.12			5.20		$40		$10		$50

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	19. Install 1-1/2" conduit hub	1	EA	1.50	2	21.12			7.90		$40		$10		$50
D	20. Install control wire 3#14	880	FT	0.03	28	21.12			0.21		$590		$190		$780
D	20. Install power wire 3#10 w/ #10 grd.	880	FT	0.04	46	21.12			0.48		$970		$430		$1,400
D	21. Install power wire 3#12 w/ #12 grd.	880	FT	0.04	38	21.12			0.36		$800		$320		$1,120
D	22. Install power wire 3#4 w/ #8 grd.	880	FT	0.07	71	21.12			1.15		$1,500		$1,040		$2,540
D	23. Install power wire 3#2 w/ #8 grd.	440	FT	0.08	40	21.12			1.66		$840		$750		$1,590
D	24. Install wire term. 600v, 1/c #14	12	EA	0.20	3	21.12			0.20		$60				$60
D	25. Install wire term. 600v, 1/c #12	16	EA	0.20	4	21.12			0.20		$80				$80
D	26. Install wire term. 600v, 1/c #10	4	EA	0.30	1	21.12			0.25		$20				$20
D	27. Install wire term. 600v, 1/c #8	6	EA	0.40	3	21.12			0.90		$60		$10		$70
D	28. Install wire term. 600v, 1/c #4	12	EA	0.40	6	21.12			1.30		$130		$20		$150
D	29. Install wire term. 600v, 1/c #2	6	EA	0.60	4	21.12			2.45		$80		$20		$100
D	Miscellaneous and support material	1	LOT	72.00	72	21.12			1078.00		$1,520		$1,100		$2,620
	Remote Handling Equipment - 82														
D	Disconnect switch.30a.600v	4	EA	2.50	12	21.12			150.00		$250		$620		$870
D	Disconnect switch.200a.600v	3	EA	6.20	22	21.12			510.00		$460		$1,570		$2,030
D	Push button station	3	EA	2.30	8	21.12			120.00		$170		$370		$540
D	1. Install 3/4" flex cond. w/ 2 conncectors	7	LOT	0.8	7	21.12			12.05		$150		$90		$240
D	2. Install 2" flex cond. w/ 2 conncectors	3	LOT	2.0	7	21.12			61.70		$150		$190		$340
D	5. Install 3/4" conduit galv. rigid stl.	2800	FT	0.08	266	21.12			0.95		$5,620		$2,730		$8,350
D	6. Install 2" conduit galv. rigid stl.	1200	FT	0.17	242	21.12			3.08		$5,110		$3,790		$8,900
D	8. Install 3/4" "L" ftg. w/cover & gasket	56	EA	1.00	66	21.12			9.90		$1,390		$570		$1,960
D	10. Install 2" "L" ftg. w/cover & gasket	24	EA	2.50	71	21.12			54.20		$1,500		$1,330		$2,830
D	11. Install 3/4" conduit union "UNY"	22	EA	0.80	21	21.12			7.90		$440		$180		$620
D	13. Install 2" conduit union "UNY"	10	EA	1.50	18	21.12			34.40		$380		$350		$730
D	14. Install 3/4" conduit seal "EYS"	7	EA	0.90	7	21.12			10.00		$150		$70		$220
D	16. Install 2" conduit seal "EYS"	3	EA	1.60	6	21.12			30.20		$130		$90		$220
D	17. Install 3/4" conduit hub	7	EA	0.80	7	21.12			4.40		$150		$30		$180
D	19. Install 2" conduit hub	3	EA	1.90	7	21.12			11.00		$150		$30		$180
D	20. Install power wire 3#8 w/ #10 grd.	2100	FT	0.05	132	21.12			0.60		$2,790		$1,290		$4,080
D	21. Install power wire 3#12 w/ #12 grd.	420	FT	0.04	18	21.12			0.36		$380		$150		$530
D	22. Install power wire 3#10 w/ #10 grd.	420	FT	0.04	22	21.12			0.48		$460		$210		$670
D	23. Install power wire 3#2/0 w/ #4 grd.	1260	FT	0.11	170	21.12			3.18		$3,590		$4,110		$7,700

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	25. Install wire term. 600v, 1/c #12	8	EA	0.20	2	21.12			0.20		$40				$40
D	26. Install wire term. 600v, 1/c #10	18	EA	0.20	4	21.12			0.20		$80				$80
D	27. Install wire term. 600v, 1/c #8	30	EA	0.30	11	21.12			0.85		$230		$30		$260
D	28. Install wire term. 600v, 1/c #4	6	EA	0.40	3	21.12			1.30		$60		$10		$70
D	29. Install wire term. 600v, 1/c #2/0	18	EA	0.80	17	21.12			3.20		$360		$60		$420
D	Miscellaneous and support material	1	LOT	112.00	112	21.12			1983.00		$2,370		$2,030		$4,400
	Radiation Shielding equipment - 83														
D	1. Install 3/4" flex cond. w/ 2 conncectors	16	LOT	0.8	15	21.12			12.05		$320		$200		$520
D	Disconnect switch.30a.600v	16	EA	2.50	47	21.12			150.00		$990		$2,460		$3,450
D	3. Install 3/4" conduit galv. rigid stl.	6720	FT	0.08	637	21.12			0.95		$13,450		$6,540		$19,990
D	4. Install 3/4" "L" ftg. w/cover & gasket	135	EA	1.00	160	21.12			9.90		$3,380		$1,370		$4,750
D	5. Install 3/4" conduit union "UNY"	54	EA	0.80	51	21.12			7.90		$1,080		$440		$1,520
D	6. Install 3/4" conduit seal "EYS"	18	EA	0.90	19	21.12			10.00		$400		$180		$580
D	7. Install 3/4" conduit hub	18	EA	0.80	17	21.12			4.40		$360		$80		$440
D	8. Install power wire 3#12 w/ #12 grd.	7000	FT	0.04	299	21.12			0.40		$6,310		$2,870		$9,180
D	9. Install wire term. 600v, 1/c #12	128	EA	0.20	30	21.12			0.20		$630		$30		$660
D	Miscellaneous and support material	1	LOT	135.00	135	21.12			1715.00		$2,850		$1,760		$4,610
	Sampling System - 84														
D	1. Install 3/4" flex cond. w/ 2 conncectors	2	LOT	0.8	2	21.12			12.05		$40		$20		$60
D	Disconnect switch.30a.600v	2	EA	2.50	6	21.12			150.00		$130		$310		$440
D	3. Install 3/4" conduit galv. rigid stl.	800	FT	0.08	76	21.12			0.95		$1,610		$780		$2,390
D	4. Install 3/4" "L" ftg. w/cover & gasket	16	EA	1.00	19	21.12			9.90		$400		$160		$560
D	5. Install 3/4" conduit union "UNY"	6	EA	0.80	6	21.12			7.90		$130		$50		$180
D	6. Install 3/4" conduit seal "EYS"	2	EA	0.90	2	21.12			10.00		$40		$20		$60
D	7. Install 3/4" conduit hub	2	EA	0.80	2	21.12			4.40		$40		$10		$50
D	8. Install power wire 3#8 w/ #10 grd.	420	FT	0.05	26	21.12			0.60		$550		$260		$810
D	9. Install wire term. 600v, 1/c #8	6	EA	0.25	2	21.12			0.90		$40		$10		$50
D	Miscellaneous and support material	1	LOT	9.00	11	21.12			110.00		$230		$110		$340
D	8. Install power wire 3#12 w/ #12 grd.	420	FT	0.04	18	21.12			0.36		$380		$150		$530
D	9. Install wire term. 600v, 1/c #12	8	EA	0.20	2	21.12			0.25		$40				$40
D	9. Install wire term. 600v, 1/c #10	2	EA	0.25	1	21.12			0.25		$20				$20

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CONTRACTOR

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	CCTV Systems - 85														
D	1. Install 3/4" conduit galv. rigid stl.	5200	FT	0.08	493	21.12			0.95		$10,410		$5,060		$15,470
D	2. Install 3/4" "L" ftg. w/cover & gasket	104	EA	1.00	123	21.12			9.90		$2,600		$1,060		$3,660
D	3. Install 3/4" conduit union "UNY"	58	EA	0.80	55	21.12			7.90		$1,160		$470		$1,630
D	4. Install 3/4" conduit seal "EYS"	58	EA	0.90	62	21.12			10.00		$1,310		$590		$1,900
D	5. Install 3/4" conduit hub	58	EA	0.80	55	21.12			4.40		$1,160		$260		$1,420
D	6. Install power wire 3#12 w/ #12 grd.	3000	FT	0.04	128	21.12			0.36		$2,700		$1,110		$3,810
D	7. Install wire term. 600v, 1/c #12	208	EA	0.20	49	21.12			0.25		$1,030		$50		$1,080
D	8. Install video cable	3000	FT	0.01	36	21.12			0.21		$760		$650		$1,410
D	9. Install wire term. 600v co-axial cable	52	EA	0.20	12	21.12			3.00		$250		$160		$410
D	Pan and tilt control wire 3#14	3000	FT	0.03	96	21.12			0.21		$2,030		$650		$2,680
D	Install wire term. 600v, 1/c #14	156	EA	0.20	37	21.12			0.20		$780		$30		$810
D	Miscellaneous and support material	1	LOT	110.00	110	21.12			1282.00		$2,320		$1,310		$3,630
	Fire Detection & Alarm - 92														
D	1. Install manual smoke detectors	1	LOT	500.0	593	21.12			7000		$12,520		$7,180		$19,700
	Install miscl. conduit fitting & wires														
	Health Protection - 93														
D	1. Install flex cond. assy. for monitors	38	EA	1.1	50	21.12			14.00		$1,060		$550		$1,610
D	2. Install stn. stl. box (20" x 20" x 6")	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" cond. galv. stl.	1700	FT	0.08	161	21.12			0.95		$3,400		$1,660		$5,060
D	4. Install 1" cond. galv. stl.	230	FT	0.11	30	21.12			1.44		$630		$340		$970
D	5. Install 1-1/2" cond. galv. stl.	200	FT	0.14	33	21.12			2.30		$700		$470		$1,170
D	6. Install 2" cond. galv. stl.	90	FT	0.17	18	21.12			3.08		$380		$280		$660
D	7. Install 3/4" "L" ftg. w/cover & gasket	54	EA	1.00	64	21.12			9.90		$1,350		$550		$1,900
D	8. Install 1" "L" ftg. w/cover & gasket	7	EA	1.20	10	21.12			14.50		$210		$100		$310
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	21.12			27.00		$360		$190		$550
D	10. Install 2" "L" ftg. w/cover & gasket	4	EA	2.50	12	21.12			42.00		$250		$170		$420
D	11. Install 3/4" "T" ftg. w/cover & gasket	40	EA	1.20	57	21.12			11.30		$1,200		$460		$1,660
D	12. Install 1" "T" ftg. w/cover & gasket	7	EA	1.50	12	21.12			16.60		$250		$120		$370
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	7	EA	2.50	21	21.12			30.30		$440		$220		$660
D	14. Install 2" "T" ftg. w/cover & gasket	4	EA	3.00	14	21.12			46.30		$300		$190		$490
D	15. Install 3/4" conduit union "UNY"	17	EA	0.80	16	21.12			7.90		$340		$140		$480
D	16. Install 1" conduit union "UNY"	7	EA	1.00	8	21.12			13.40		$170		$100		$270
D	17. Install 1-1/2" conduit union "UNY"	7	EA	1.50	12	21.12			26.70		$250		$190		$440

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	18. Install 2" conduit union "UNY"	2	EA	1.90	5	21.12			34.40		$110		$70		$180
D	Install 2" conduit union "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	19. Install 1/2" conduit drain	26	EA	0.20	6	21.12			25		$130		$670		$800
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	6950	FT	0.02	148	21.12			0.23		$3,130		$1,640		$4,770
D	21. Install 1pr-#16 wire termination, 300v	76	EA	0.40	36	21.12			0.30		$760		$20		$780
D	Miscellaneous and support material	1	LOT	46.00	55	21.12			765.00		$1,160		$780		$1,940
	Power wiring to CAMs														
D	1. Install 3/4" cond. galv. stl.	1700	FT	0.08	161	21.12			0.95		$3,400		$1,660		$5,060
D	2. Install 3/4" GRFX box	38	EA	2.20	99	21.12			32.90		$2,090		$1,280		$3,370
D	3. Install 3/4" "L" ftg. w/ cover & gasket	53	EA	1.00	63	21.12			9.90		$1,330		$540		$1,870
D	4. Install 3/4" "T" ftg. w/cover & gasket	9	EA	1.20	13	21.12			11.30		$270		$100		$370
D	5. Install 3/4" conduit union "UNY"	23	EA	0.80	22	21.12			7.90		$460		$190		$650
D	6. Install 3/4" conduit hub	4	EA	0.80	4	21.12			4.40		$80		$20		$100
D	7. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	21.12			10.00		$80		$40		$120
D	8. Install power wire 2#12 w/ #12 grd.	2600	FT	0.03	83	21.12			0.27		$1,750		$720		$2,470
D	9. Install wire term. 600v, 1/c #12	130	EA	0.20	31	21.12			0.25		$650		$30		$680
D	Miscellaneous and support material	1	LOT	40.00	47	21.12			507.00		$990		$520		$1,510
	Distributed Control System - 90														
D	1. Install 1-1/2" cond. galv. stl.	3000	FT	0.14	498	21.12			2.30		$10,520		$7,070		$17,590
D	2. Install 2" cond. galv. stl.	8500	FT	0.17	1713	21.12			3.08		$36,180		$26,830		$63,010
D	3. Install 1-1/2" "L" ftg. w/cover & gasket	90	EA	2.00	213	21.12			27.00		$4,500		$2,490		$6,990
D	4. Install 2" "L" ftg. w/cover & gasket	255	EA	2.50	756	21.12			42.00		$15,970		$10,980		$26,950
D	5. Install 1-1/2" conduit union "UNY"	34	EA	1.50	60	21.12			26.70		$1,270		$930		$2,200
D	6. Install 2" conduit union "UNY"	95	EA	1.90	214	21.12			34.40		$4,520		$3,350		$7,870
D	7. Install 1-1/2" conduit union "EYS"	6	EA	1.40	10	21.12			23.20		$210		$140		$350
D	8. Install 2" conduit union "EYS"	17	EA	1.60	32	21.12			30.20		$680		$530		$1,210
D	9. Install 1-1/2" conduit hub	6	EA	1.50	11	21.12			7.90		$230		$50		$280
D	10. Install 2" conduit hub	17	EA	1.90	38	21.12			11.00		$800		$190		$990
D	11. Install instr. cable 12pr #20	3120	FT	0.04	133	21.12			1.20		$2,810		$3,840		$6,650
D	12. Install 1pr #16 str.cu shld. w/ pvc 300v	960	FT	0.40	455	21.12			0.30		$9,610		$300		$9,910
D	13. Install instr. cable 24pr #20	8850	FT	0.06	577	21.12			2.10		$12,190		$19,050		$31,240
D	Miscellaneous and support material	1	LOT	479.00	479	21.12			9143.00		$10,120		$9,370		$19,490

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CONTRACTOR

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	Product Additive System - 44														
D	1. Install flex cond. assy. for monitors	135	EA	1.1	176	21.12			14.00		$3,720		$1,940		$5,660
D	2. Install stn. stl. box (20" x 20" x 6")	7	EA	10.3	85	21.12			630.00		$1,800		$4,520		$6,320
D	3. Install 3/4" cond. galv. stl.	2500	FT	0.08	237	21.12			0.95		$5,010		$2,430		$7,440
D	4. Install 1" cond. galv. stl.	600	FT	0.11	78	21.12			1.44		$1,650		$890		$2,540
D	5. Install 1-1/2" cond. galv. stl.	550	FT	0.14	91	21.12			2.30		$1,920		$1,300		$3,220
D	6. Install 2" cond. galv. stl.	280	FT	0.17	56	21.12			3.08		$1,180		$880		$2,060
D	7. Install 3/4" "L" ftg. w/cover & gasket	110	EA	1.00	130	21.12			9.90		$2,750		$1,120		$3,870
D	8. Install 1" "L" ftg. w/cover & gasket	22	EA	1.20	31	21.12			14.50		$650		$330		$980
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	22	EA	2.00	52	21.12			27.00		$1,100		$610		$1,710
D	10. Install 2" "L" ftg. w/cover & gasket	11	EA	2.50	33	21.12			42.00		$700		$470		$1,170
D	11. Install 3/4" "T" ftg. w/cover & gasket	120	EA	1.20	171	21.12			11.30		$3,610		$1,390		$5,000
D	12. Install 1" "T" ftg. w/cover & gasket	22	EA	1.50	39	21.12			16.60		$820		$370		$1,190
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	22	EA	2.50	65	21.12			30.30		$1,370		$680		$2,050
D	14. Install 2" "T" ftg. w/cover & gasket	22	EA	3.00	78	21.12			46.30		$1,650		$1,040		$2,690
D	15. Install 3/4" conduit union "UNY"	42	EA	0.80	40	21.12			7.90		$840		$340		$1,180
D	16. Install 1" conduit union "UNY"	9	EA	1.00	11	21.12			13.40		$230		$120		$350
D	17. Install 1-1/2" conduit union "UNY"	9	EA	1.50	16	21.12			26.70		$340		$250		$590
D	18. Install 2" conduit union "UNY"	13	EA	1.90	29	21.12			34.40		$610		$460		$1,070
D	Install 2" conduit union "EYS"	7	EA	1.60	13	21.12			30.20		$270		$220		$490
D	Install 2" conduit hub	7	EA	1.90	16	21.12			11.00		$340		$80		$420
D	19. Install 1/2" conduit drain	96	EA	0.20	23	21.12			25		$490		$2,460		$2,950
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	12300	FT	0.02	262	21.12			0.23		$5,530		$2,900		$8,430
D	21. Install 1pr-#16 wire termination, 300v	270	EA	0.40	128	21.12			0.30		$2,700		$80		$2,780
D	Miscellaneous and support material	1	LOT	138.00	138	21.12			2343.00		$2,910		$2,400		$5,310
	Product Recycle System - 26														
D	1. Install flex cond. assy. for monitors	24	EA	1.1	31	21.12			14.00		$650		$340		$990
D	2. Install stn. stl. box (20" x 20" x 6")	2	EA	10.3	24	21.12			630.00		$510		$1,290		$1,800
D	3. Install 3/4" cond. galv. stl.	450	FT	0.08	43	21.12			0.95		$910		$440		$1,350
D	4. Install 1" cond. galv. stl.	110	FT	0.11	14	21.12			1.44		$300		$160		$460
D	5. Install 1-1/2" cond. galv. stl.	100	FT	0.14	17	21.12			2.30		$360		$240		$600
D	6. Install 2" cond. galv. stl.	50	FT	0.17	10	21.12			3.08		$210		$160		$370
D	7. Install 3/4" "L" ftg. w/cover & gasket	20	EA	1.00	24	21.12			9.90		$510		$200		$710
D	8. Install 1" "L" ftg. w/cover & gasket	4	EA	1.20	6	21.12			14.50		$130		$60		$190

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	4	EA	2.00	9	21.12			27.00		$190		$110		$300
D	10. Install 2" "L" ftg. w/cover & gasket	2	EA	2.50	6	21.12			42.00		$130		$90		$220
D	11. Install 3/4" "T" ftg. w/cover & gasket	22	EA	1.20	31	21.12			11.30		$650		$250		$900
D	12. Install 1" "T" ftg. w/cover & gasket	4	EA	1.50	7	21.12			16.60		$150		$70		$220
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	4	EA	2.50	12	21.12			30.30		$250		$120		$370
D	14. Install 2" "T" ftg. w/cover & gasket	4	EA	3.00	14	21.12			46.30		$300		$190		$490
D	15. Install 3/4" conduit union "UNY"	8	EA	0.80	8	21.12			7.90		$170		$60		$230
D	16. Install 1" conduit union "UNY"	2	EA	1.00	2	21.12			13.40		$40		$30		$70
D	17. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	18. Install 2" conduit union "UNY"	4	EA	1.90	9	21.12			34.40		$190		$140		$330
D	Install 2" conduit union "EYS"	2	EA	1.60	4	21.12			30.20		$80		$60		$140
D	Install 2" conduit hub	2	EA	1.90	5	21.12			11.00		$110		$20		$130
D	19. Install 1/2" conduit drain	16	EA	0.20	4	21.12			25		$80		$410		$490
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	2300	FT	0.02	49	21.12			0.23		$1,030		$540		$1,570
D	21. Install 1pr-#16 wire termination, 300v	48	EA	0.40	23	21.12			0.30		$490		$10		$500
D	Miscellaneous and support material	1	LOT	26.00	31	21.12			462.00		$650		$470		$1,120
	Remote Handling Equip. System - 82														
D	1. Install flex cond. assy. for monitors	22	EA	1.1	29	21.12			14.00		$610		$320		$930
D	2. Install stn. stl. box (20" x 20" x 6")	1	EA	10.3	12	21.12			630.00		$250		$650		$900
D	3. Install 3/4" cond. galv. stl.	510	FT	0.08	48	21.12			0.95		$1,010		$500		$1,510
D	4. Install 1" cond. galv. stl.	120	FT	0.11	16	21.12			1.44		$340		$180		$520
D	5. Install 1-1/2" cond. galv. stl.	110	FT	0.14	18	21.12			2.30		$380		$260		$640
D	6. Install 2" cond. galv. stl.	60	FT	0.17	12	21.12			3.08		$250		$190		$440
D	7. Install 3/4" "L" ftg. w/cover & gasket	22	EA	1.00	26	21.12			9.90		$550		$220		$770
D	8. Install 1" "L" ftg. w/cover & gasket	5	EA	1.20	7	21.12			14.50		$150		$70		$220
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	5	EA	2.00	12	21.12			27.00		$250		$140		$390
D	10. Install 2" "L" ftg. w/cover & gasket	2	EA	2.50	6	21.12			42.00		$130		$90		$220
D	11. Install 3/4" "T" ftg. w/cover & gasket	24	EA	1.20	34	21.12			11.30		$720		$280		$1,000
D	12. Install 1" "T" ftg. w/cover & gasket	5	EA	1.50	9	21.12			16.60		$190		$90		$280
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	5	EA	2.50	15	21.12			30.30		$320		$160		$480
D	14. Install 2" "T" ftg. w/cover & gasket	5	EA	3.00	18	21.12			46.30		$380		$240		$620
D	15. Install 3/4" conduit union "UNY"	9	EA	0.80	9	21.12			7.90		$190		$70		$260
D	16. Install 1" conduit union "UNY"	2	EA	1.00	2	21.12			13.40		$40		$30		$70

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CONTRACTOR

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
.2															
D	17. Install 1-1/2" conduit union "UNY"	2	EA	1.50	4	21.12			26.70		$80		$50		$130
D	18. Install 2" conduit union "UNY"	3	EA	1.90	7	21.12			34.40		$150		$110		$260
D	Install 2" conduit union "EYS"	1	EA	1.60	2	21.12			30.20		$40		$30		$70
D	Install 2" conduit hub	1	EA	1.90	2	21.12			11.00		$40		$10		$50
D	19. Install 1/2" conduit drain	16	EA	0.20	4	21.12			25		$80		$410		$490
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	2500	FT	0.02	53	21.12			0.23		$1,120		$590		$1,710
D	21. Install 1pr-#16 wire termination, 300v	44	EA	0.40	21	21.12			0.30		$440		$10		$450
D	Miscellaneous and support material	1	LOT	27.00	32	21.12			452.00		$680		$460		$1,140
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		68,200	$21.12					1,440,200		1,067,500	956,300	$3,464,000

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	700 - Instrumentation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2	SYSTEM 15														
D	1. Install Feed Preparation	1	LOT	757.0	897	21.12			111770		$18,940		$114,560		$133,500
	SYSTEM 16														
D	1. Install Process Feed sys.	1	LOT	975.0	1156	21.12			88440		$24,410		$90,650		$115,060
	SYSTEM 26														
D	1. Install ph element/ transmitters	2	EA	9.0	21	21.12			1200		$440		$2,460		$2,900
D	2. Install flow transmitter	1	EA	18.0	21	21.12			7215		$440		$7,400		$7,840
D	3. Install bindicator type switch	4	EA	17.0	81	21.12			900		$1,710		$3,690		$5,400
D	4. Install diff. pressure transmitter	2	EA	10.0	24	21.12			1537		$510		$3,150		$3,660
	SYSTEM 44														
D	**1. Install HVAC controls**	34	EA	8.0	322	21.12			940		$6,800		$32,760		$39,560
D	2. Product Recycle system 44	1	LOT	714.0	847	21.12			46128		$17,890		$47,280		$65,170
D	**3. Install instruments bulk - other**	1	LOT	300.0	356	21.12			9550		$7,520		$9,790		$17,310
	SYSTEM 82														
D	1. Install pneum. actuated valve sys.	3	EA	6.0	21	21.12			1032		$440		$3,170		$3,610
D	2. Install density transmitter	1	EA	22.0	26	21.12			14620		$550		$14,990		$15,540
D	3. Install pipe for valves	4	EA	12.0	57	21.12			230		$1,200		$940		$2,140
	SYSTEM 90														
D	1. Install distrib. control sys.	1	LOT	225.0	267	21.12			282000		$5,640		$289,050		$294,690
D	2. Install control software	1	LOT			21.12			126500				$129,660		$129,660
	SYSTEM 92														
D	1. Install fire alarm & evacution sys.	1	LOT	150.0	178	21.12			30000		$3,760		$30,750		$34,510
	SYSTEM 93														
D	1. Install real time SOx monitor	1	EA	12.0	14	21.12			12650		$300		$12,970		$13,270
D	2. Install hps control station	2	EA	18.0	43	21.12			27000		$910		$55,350		$56,260
D	3. Install auto rad. counter	2	EA	24.0	57	21.12			35725		$1,200		$73,240		$74,440
D	4. Install pressure rad. monitor	9	EA	4.0	43	21.12			4200		$910		$38,750		$39,660
D	5. Install rad. working level monitor	8	EA	12.0	114	21.12			11000		$2,410		$90,200		$92,610
D	6. Install body frisker	3	EA	20.0	71	21.12			42000		$1,500		$129,150		$130,650
D	7. Install air samplg station (CAM)	12	EA	4.0	57	21.12			1900		$1,200		$23,370		$24,570
D	8. Install tool contaim. monitor	2	EA	10.0	24	21.12			19000		$510		$38,950		$39,460
D	9. Install isokinetic air sampler	2	EA	60.0	142	21.12			30000		$3,000		$61,500		$64,500
D	**10. Install leak detection**	14	EA	21.5	357	21.12			901.5		$7,540		$12,940		$20,480
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		5,196	$21.11					109,700		1,316,700		$1,426,400

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	800 - Paint / Insulation	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
D	1. Paint steel	117225	SF	0.02	2085	22.18			0.11		$46,250		$13,220		$59,470
D	2. Paint gyp board	28320	SF	0.01	403	22.18			0.09		$8,940		$2,610		$11,550
D	3. Paint single doors	61	EA	2.7	195	22.18			5.85		$4,330		$370		$4,700
D	4. Paint double door	17	EA	5.4	109	22.18			11.7		$2,420		$200		$2,620
D	5. Paint masonry	118375	SF	0.02	2807	22.18			0.39		$62,260		$47,320		$109,580
D	8. Paint equipment	12310	SF	0.02	219	22.18			0.11		$4,860		$1,390		$6,250
D	1. Paint bulk-other	1	LOT	1619	1919	22.18			8975.00		$42,560		$9,200		$51,760
D	2. Insulation -other	1	LOT	2900	3438	22.18			41900		$76,250		$42,950		$119,200
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		11,175	$22.18					247,900		117,300		$365,200

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	AAA-Mobilization	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
2															
	ALIGNMENT & PROJECT MEETINGS														
	(5) MEETINGS, 2 DAYS EACH for (7) People														
	TRAVEL - AIR FARE	35.0	TRIPS					$1,000.00				$35,000			$35,000
	CAR RENTAL - (2) CARS PER TRIP @ (2) DAYS EA	20.0	DAYS					$50.00				$1,000			$1,000
	GASOLINE - 200 mi./TRIP/CAR	2,000.0	MI					$1.45				$2,900			$2,900
	CAR LEASING - (2) CARS @ $35/day	2.0	CARS					$12,000				$24,000			$24,000
	PER DIEM -	70.0	PD					$96.00				$6,720			$6,720
	LABOR @ 8 HRS /DAY	560.0	MH	1.0	560	$75.00					$42,000				$42,000
	RELOCATION														
	HOUSEHOLD MOVE & TRAVEL	10	PEOPLE					$45,000				$450,000			$450,000
	EXPENSE	10	PEOPLE					$15,000				$150,000			$150,000
	TOTAL COST for ALIGNMENT	1	LS								$42,000	$669,620			$711,620
	HEALTH & SAFETY PLAN - PRE OPERATIONAL														
	- Site Preparation	1	LS	120.0	120	$75.00					$9,000				$9,000
	- Facility Construction	1	LS	120.0	120	$75.00					$9,000				$9,000
	TOTAL - HEALTH $ SAFETY	1	LS		240						$18,000				$18,000
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		800	$75.00					60,000	669,600			$729,600

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COST IMPACT MATRIX SHEET

Estimate No.: C4981004
Project: Silos 1 & 2 Chemical Stabilization (FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 21-Oct-99
Estimator: J. ELLIS
Location: Fernald

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Civil & Excav. All Facilities		Civil & Excav. All Facilities		Civil & Excav. All Facilities		Concrete All Facilities		Concrete All Facilities		Chemical Stabilization	
$41,310,200	Labor		Material		Equipment		Labor		Material		PPE (Material)	
Cost	Base $	$496,600	Base $	$154,470	Base $	$13,540	Base $	$5,163,470	Base $	$1,866,960	Base $	$73,680
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			0%	0%	-1%	15%				
Material Pricing			-1%	10%	-1%	10%			-1%	10%	-1%	15%
Contamination	-1%	10%					-1%	10%				
Technology												
Regulations/Laws											-1%	10%
Quantity Variation	-1%	10%	-1%	15%	0%	15%	0%	10%	-1%	10%		
Project Definition	-1%	10%					-1%	5%				
Other												
Range - %	-4%	40%	-2%	25%	-1%	25%	-3%	40%	-2%	20%	-2%	25%
Range - $	$476,736	$695,240	$151,381	$193,088	$13,405	$16,925	$5,008,566	$7,228,858	$1,829,621	$2,240,352	$72,206	$92,100
Distribution	Uniform		U		U		U		U		Uniform	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Structural Steel All Facilities		Structural Steel All Fac.		Arch./Buildings/Finishes All Fac.		Arch./Building/Finishes All Fac.		Equipment Systems 15 - 94		Equipment Systems 15 - 94	
	Labor		Material		Labor		Material		Labor		Equipment	
Cost	Base $	$855,740	Base $	$1,268,820	Base $	$1,775,840	Base $	$1,921,580	Base $	$1,271,210	Base $	$14,827,040
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	15%			-1%	15%			-1%	20%		
Material Pricing			-1%	10%			0%	10%			-1%	20%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation			-1%	10%			-1%	10%			-1%	10%
Project Definition	-1%	10%			-1%	15%			-1%	15%	-1%	10%
Other												
Range - %	-2%	25%	-2%	20%	-2%	30%	-1%	20%	-2%	35%	-3%	40%
Range - $	$838,625	$1,069,675	$1,243,444	$1,522,584	$1,740,323	$2,308,592	$1,902,364	$2,305,896	$1,245,786	$1,716,134	$14,382,229	$20,757,856
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

Analyst: _____

Client: _____

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COST IMPACT MATRIX SHEET

Estimate No.: C4981004
Project: Silos 1 & 2 Chemical Stabilization (FS)
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Est. Chg. No.: 4S11B
Date: 21-Oct-99
Estimator: J. ELLIS
Location: Fernald

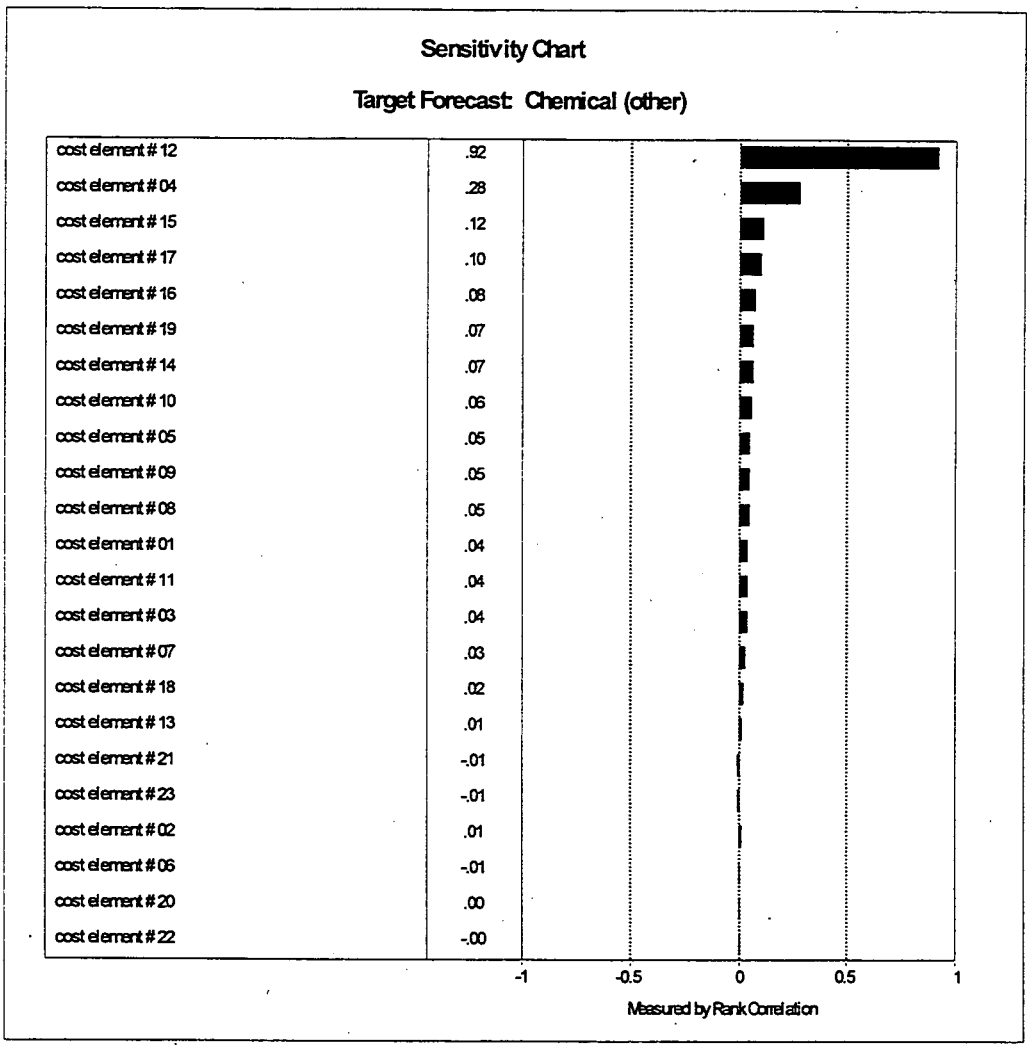
	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Piping Labor		Piping Material		Electrical Labor		Electrical Material		Electrical Equipment		Instrumentation Labor	
Cost	Base $	$756,560	Base $	$526,580	Base $	$3,634,320	Base $	$1,506,640	Base $	$1,320,840	Base $	$274,730
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			-1%	10%					-1%	10%
Material Pricing			-1%	15%			-1%	10%	-1%	20%		
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	5%	0%	10%			0%	10%	-1%	10%		
Project Definition	0%	5%			0%	10%			-1%	10%	0%	5%
Other												
Range - %	-1%	20%	-1%	25%	-1%	20%	-1%	20%	-3%	40%	-1%	15%
Range - $	$748,994	$907,872	$521,314	$658,225	$3,597,977	$4,361,184	$1,491,574	$1,807,968	$1,281,215	$1,849,176	$271,983	$315,940
Distribution	Uniform		U		U		U		U		Uniform	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Instrumentation Material		Paint / Insulation Labor		Paint/ Insulation Material		Mobilization labor		Mobilization S/C			
Cost	Base $	$1,858,350	Base $	$620,830	Base $	$165,550	Base $	$150,260	Base $	$806,590	Base $	$0
Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			0%	10%	-1%	10%	-1%	10%				
Material Pricing	0%	15%							-1%	10%		
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	5%							0%	5%		
Project Definition	0%	5%	0%	5%	0%	5%	0%	10%				
Other												
Range - %	0%	25%	0%	15%	-1%	15%	-1%	20%	-1%	15%	0%	0%
Range - $	$1,858,350	$2,322,938	$620,830	$713,955	$163,895	$190,383	$148,757	$180,312	$798,524	$927,579	$0	$0
Distribution	Uniform		U		U		U		U			
Correlation Rank												

Analyst: _____

Client: _____

Crystal Ball Report

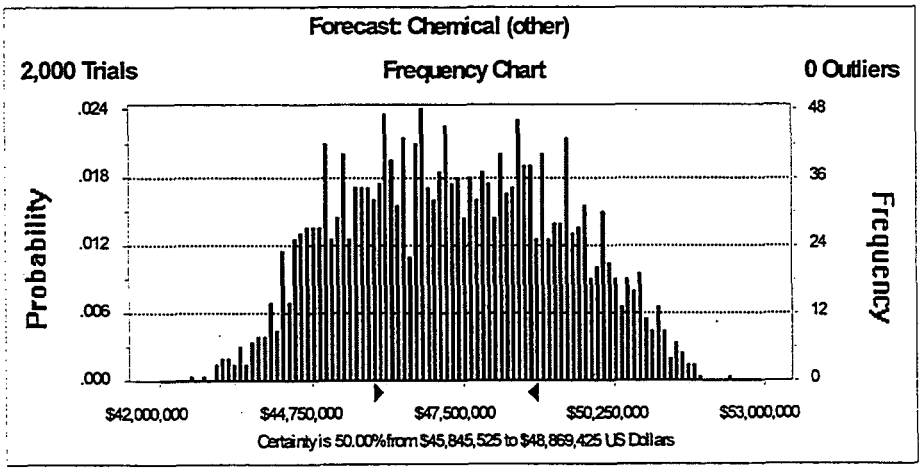


Forecast: Chemical (other) **Cell: C52**

Summary:

Certainty Level is 50.00%
Certainty Range is from $45,845,525 to $48,869,425 US Dollars
Display Range is from $42,000,000 to $53,000,000 US Dollars
Entire Range is from $42,602,257 to $52,377,318 US Dollars
After 2,000 Trials, the Std. Error of the Mean is $43,414

Statistics:	Value
Trials	2000
Mean	$47,374,370
Median	$47,307,424
Mode	---
Standard Deviation	$1,941,535
Variance	4E+12
Skewness	0.06
Kurtosis	2.16
Coeff. of Variability	0.04
Range Minimum	$42,602,257
Range Maximum	$52,377,318
Range Width	$9,775,060
Mean Std. Error	$43,414.05



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Forecast: Chemical (other) (cont'd) **Cell: C52**

Percentiles:

Percentile			US Dollars
0.0%			$42,602,257
2.5%			$44,006,585
5.0%			$44,350,712
50.0%	Risk Budget	14.5%	$47,307,424
95.0%			$50,596,125
97.5%			$50,971,469
100.0%			$52,377,318

End of Forecast

RISK ANALYSIS INPUT DATA TABLE

Chemical (other) Estimate No.:C4981004

Item No.	Cost Element Description	Estimated Base $	Distribution Range Width Low %	Low $	High %	High $	Dist. Type	Corr. Rank
01	cost element # 01	$496,600	-4%	$476,736	40%	$695,240	U	-
02	cost element # 02	$154,470	-2%	$151,381	25%	$193,088	U	-
03	cost element # 03	$13,540	-1%	$13,405	25%	$16,925	U	-
04	cost element # 04	$5,163,470	-3%	$5,008,566	40%	$7,228,858	U	-
05	cost element # 05	$1,866,960	-2%	$1,829,621	20%	$2,240,352	U	-
06	cost element # 06	$73,680	-2%	$72,206	25%	$92,100	U	-
07	cost element # 07	$855,740	-2%	$838,625	25%	$1,069,675	U	-
08	cost element # 08	$1,268,820	-2%	$1,243,444	20%	$1,522,584	U	-
09	cost element # 09	$1,775,840	-2%	$1,740,323	30%	$2,308,592	U	-
10	cost element # 10	$1,921,580	-1%	$1,902,364	20%	$2,305,896	U	-
11	cost element # 11	$1,271,210	-2%	$1,245,786	35%	$1,716,134	U	-
12	cost element # 12	$14,827,040	-3%	$14,382,229	40%	$20,757,856	U	-
13	cost element # 13	$756,560	-1%	$748,994	20%	$907,872	U	-
14	cost element # 14	$526,580	-1%	$521,314	25%	$658,225	U	-
15	cost element # 15	$3,634,320	-1%	$3,597,977	20%	$4,361,184	U	-
16	cost element # 16	$1,506,640	-1%	$1,491,574	20%	$1,807,968	U	-
17	cost element # 17	$1,320,840	-3%	$1,281,215	40%	$1,849,176	U	-
18	cost element # 18	$274,730	-1%	$271,983	15%	$315,940	U	-
19	cost element # 19	$1,858,350	0%	$1,858,350	25%	$2,322,938	U	-
20	cost element # 20	$620,830	0%	$620,830	15%	$713,955	U	-
21	cost element # 21	$165,550	-1%	$163,895	15%	$190,383	U	-
22	cost element # 22	$150,260	-1%	$148,757	20%	$180,312	U	-
23	cost element # 23	$806,590	-1%	$798,524	15%	$927,579	U	-
24				$0		$0		
25				$0		$0		
26				$0		$0		
27				$0		$0		
28				$0		$0		
29				$0		$0		
30				$0		$0		
31				$0		$0		
32				$0		$0		
33				$0		$0		
34				$0		$0		
35				$0		$0		
36				$0		$0		
37				$0		$0		
38				$0		$0		
39				$0		$0		
40				$0		$0		
41				$0		$0		
42				$0		$0		
43				$0		$0		
44				$0		$0		
45				$0		$0		
Total	Chemical (other)	$41,310,200		$40,408,098		$54,382,829		

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C.5.3 Engineering Cost Estimate

C.5.3.1 Cost Summary

Engineering cost is the cost of design (preliminary design, detailed design and supporting documentation, and construction field support); it is calculated as an estimated FTE by discipline. The engineering rate of $70.00/mhr is based on a subcontract A/E firm performing the engineering activities.

The engineering cost for the Chemical Stabilization — Other facility design and labor support is summarized in **Table C.5.3-1**.

TABLE C. 5.3-1
ENGINEERING COST SUMMARY FOR CHEMICAL STABILIZATION — OTHER

Engineering mhr	340,127
Engineering Labor Rate ($1/mhr)	$70
Estimated Engineering Cost	$23,808,860

C.5.3.2 Attachment

The engineering cost estimate summary by discipline for the Chemical Stabilization — Other alternative (CHEM2), prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.5.3.I

Engineering Cost Estimate Summary for

Chemical Stabilization — Other

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
4	Conceptual Design Phase @ 25 wks duration														
	Process Engineer	6	EA	998.4	5990	70.00					$419,330				$419,330
	Mechanical Engineer	4	EA	998.4	3994	70.00					$279,550				$279,550
	Electrical Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Piping Engineer	6	EA	998.4	5990	70.00					$419,330				$419,330
	I & C Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Structural Engineer		EA	998.4		70.00									
	Civil Engineer		EA	998.4		70.00									
	HVAC Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Cost/ Scheduler	3	EA	998.4	2995	70.00					$209,660				$209,660
	Operations Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	Project Manager	1	EA	998.4	998	70.00					$69,890				$69,890
	Clerical Administration	1	EA	998.4	998	16.50					$16,470				$16,470
	Construction Engineer	1	EA	998.4	998	70.00					$69,890				$69,890
	TOTAL for Conceptual Design	1	LS		26957						1833570				$1,833,570
	Preliminary Design Phase @ 42 wks duration														
	Process Engineer	10	EA	1685.0	16850	70.00					$1,179,500				$1,179,500
	Mechanical Engineer	8	EA	1685.0	13480	70.00					$943,600				$943,600
	Electrical Engineer	3	EA	1685.0	5055	70.00					$353,850				$353,850
	Piping Engineer	8	EA	1685.0	13480	70.00					$943,600				$943,600
	I & C Engineer	4	EA	1685.0	6740	70.00					$471,800				$471,800
	Structural Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Civil Engineer	1.5	EA	1685.0	2528	70.00					$176,930				$176,930
	HVAC Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Cost/ Scheduler	6	EA	1685.0	10110	70.00					$707,700				$707,700
	Operations Manager	1	EA	1685.0	1685	70.00					$117,950				$117,950
	Project Engineer	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Project Manager	2	EA	1685.0	3370	70.00					$235,900				$235,900
	Clerical Administration	3	EA	1685.0	5055	16.50					$83,410				$83,410
	Construction Engineer	1	EA	1685.0	1685	70.00					$117,950				$117,950
	TOTAL for Preliminary Design	1	LS		90148						6039890				$6,039,890

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	ENGINEERING	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
4	Final Design Phase @ 52 wks duration														
	Process Engineer	6	EA	2080.0	12480	70.00					$873,600				$873,600
	Mechanical Engineer	10	EA	2080.0	20800	70.00					$1,456,000				$1,456,000
	Electrical Engineer	6	EA	2080.0	12480	70.00					$873,600				$873,600
	Piping Engineer	10	EA	2080.0	20800	70.00					$1,456,000				$1,456,000
	I & C Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Structural Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Civil Engineer	2	EA	2080.0	4160	70.00					$291,200				$291,200
	HVAC Engineer	4	EA	2080.0	8320	70.00					$582,400				$582,400
	Cost/ Scheduler	8	EA	2080.0	16640	70.00					$1,164,800				$1,164,800
	Operations Manager	2	EA	2080.0	4160	70.00					$291,200				$291,200
	Project Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Project Manager	3	EA	2080.0	6240	70.00					$436,800				$436,800
	Clerical Administration	5	EA	2080.0	10400	16.50					$171,600				$171,600
	Construction Engineer	3	EA	2080.0	6240	70.00					$436,800				$436,800
	TOTAL for Final Design	1	LS		143520						9490000				$9,490,000
	Construction Design Phase @ 134 wks duration														
	Process Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Mechanical Engineer	4	EA	5360.0	21440	70.00					$1,500,800				$1,500,800
	Electrical Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Piping Engineer	2	EA	5360.0	10720	70.00					$750,400				$750,400
	I & C Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Structural Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Civil Engineer		EA	5360.0		70.00									
	HVAC Engineer		EA	5360.0		70.00									
	Cost/ Scheduler	3	EA	5360.0	16080	70.00					$1,125,600				$1,125,600
	Operations Manager		EA	5360.0		70.00									
	Project Engineer	1	EA	5360.0	5360	70.00					$375,200				$375,200
	Project Manager	2	EA	5360.0	10720	70.00					$750,400				$750,400
	Clerical Administration	5	EA	5360.0	26800	16.50					$442,200				$442,200
	TOTAL for Construction	1	LS		112560						6445400				$6,445,400
	Take-off Allowance														
	Total Cost: ITEM NO. 4	1	LOT		373,184	$63.80					23,808,860				$23,808,860

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C.5.4 Operation and Maintenance Estimate Basis: Chemical Stabilization — Other

C.5.4.1 Introduction

The O&M costs for the Chemical Stabilization — Other (CHEM2) alternative is summarized in **Table C.5.4-1.**

The O&M costs were prepared as detailed estimates based on the **Basis of Design and Description (Appendix G)**, POP testing data (**Appendix H**), and O&M experience at the FEMP.

TABLE C. 5.4-1
OPERATION AND MAINTENANCE COST ESTIMATE FOR CHEMICAL STABILIZATION — OTHER

FDF Labor Costs	
FDF O&M Labor Cost	$41,467,610
FDF Start-up Labor Cost	$6,911,270
Material Costs	
Spare Parts Cost	$196,230
Consumable (PPE and Supplies) Cost	$5,147,030
Contractor Technical Support Costs	
Contractor Operation Support Cost	$2,208,960
Contractor Start-up Support Cost	$1,154,320
Other Costs	
Secondary Waste	$682,244
Utilities Cost	$3,313,150
Risk Budget	$21,428,460
Total O&M	$82,509,274

C.5.4.2 Estimate Basis

The cost estimate basis for the O&M cost for the Chemical Stabilization — Other alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.5.4.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY99 dollars.

2. FDF O&M labor is based on the FY99 FAT&LC contract and labor classifications.

3. During operations and start-up, FDF O&M labor is dedicated 100% to supporting the Silos 1 and 2 material full-scale remediation project. All other remediation activities on the site will have been completed in FY06.

4. Labor costs are based on four crews working a 48-hr/week schedule to operate and maintain a 24-hr/day, 7-days/week operation schedule.

5. Silos 1 and 2 material full-scale treatment facility has a designed operational availability of 70%.

6. The O&M staff is 100% dedicated in support of training and start-up of the Silos 1 and 2 material full-scale treatment facility. Training and start-up takes 6 months to complete.

7. Proof of Process testing (surrogate operations) is scheduled for 6 months after completion of start-up and before full-scale operation. The O&M staff is dedicated 100% to supporting the surrogate operations.

Table C.5.4-2 summarizes the labor staffing requirements to support the Chemical Stabilization — Other O&M activities.

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TABLE C. 5.4-2
OPERATION AND MAINTENANCE LABOR ESTIMATE
CHEMICAL STABILIZATION — OTHER

	SHIFT				
POSITION	FIRST	SECOND	THIRD	FOURTH	TOTAL
Plant Manager	1				1
Clerical	1				1
Procurement	1				1
Material Control & Accountability	1	1	1		3
Engineering Manager	1				1
Plant Engineer	1				1
Process Engineers	1	1	1		3
Waste Planners	3	3	3		9
Conduct of Operations	1	1	1		3
Safety Manager	1				1
Safety Engineer	1	1	1		3
Radiological Technicians	5	5	5		15
Industrial Hygiene	1	1	1		3
Operations Manager	1				1
Clerical	1				1
Shift Supervisors	2	2	1	1	6
Control Room Operators	4	4	4	2	14
Retrieval Operators	3	3	3		9
Feed Preparation Operators	2	2	2		6
Vitrifier Operator	2	2	2		6
Container Handlers	3	3	3		9
Roving Operators	1	1	1	2	5
Laboratory Technicians	3	3	3		9
Motor Vehicle Operators	2	2	2		6
Sattelite Clothing Area Ops	3	2			5
Maintenance Manager	1				1
Maintenance Clerical	1				1
Maintenance Supervisors	2	2	1	1	6
Maintenance Planner	2				2
Maintenance Scheduler	1				1
CMMS Administrator	1				1
Data Entry Clerk	1				1
Maintenance Work Order Preparers	2				2
Automated Work Package Programmer	1				1
Electricians	3	3	2	2	10
Mill Wrights	3	3	2	2	10
Instrument Mechanics	3	3	2	2	10
Pipe Fitters	3	3	2	2	10
Welders	2				2
Laborers	2				2
Oiler	1				1
DOP Crew (part-time)	7				7
Measure & Testing Equip. Crew (part-time)	4				4
Crane Crew (part-time)	4				4
Totals	90	51	43	14	198

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C.5.4.2.2 Inclusions

The O&M cost estimate includes the following cost elements:

- Start-up labor;
- O&M labor;
- Proof of process labor;
- Waste packaging labor;
- Start-up, proof of process, and operation consumables;
- Start-up, proof of process, and operation utilities;
- Spare parts;
- O&M of the RCS and the TTA; and
- Silos 1 and 2 material full-scale remediation contractor's technical oversight during start-up, proof of process, and operation activities.

C.5.4.2.3 Exclusions

The following elements of cost are excluded from the O&M cost estimate:

- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation project management cost; and
- Cost of FEMP project management oversight.

C.5.4.2.4 Format and Coding

The O&M cost estimates are compiled and summarized into the following cost centers:

- FDF labor;
  - FDF O&M labor;
  - FDF start-up;
- Material;
  - Spare parts;
  - Consumables;
- Utility;
- Contractor's technical support;
  - O&M support;
  - Start-up support; and
- Risk budget

The following discussion provides a brief description of the cost centers.

C.5.4.2.4.1 FDF Labor Cost

FDF labor cost includes the costs for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediaton activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

The FDF labor cost, summarized in **Table C.5.4-3**, is based on the following:

- FDF O&M labor force in **Table C.5.4-2** operates on a 24-hr/day, 7-day/week schedule;
- 0.5 years of start-up/training that uses the FDF O&M labor force (100% dedication to project);
- Proof of Process testing with surrogate material is performed during start-up; and
- 3.0 years total of O&M labor supporting the process operations to treat the Silos 1 and 2 material.

TABLE C. 5.4-3
SUMMARY OF FDF LABOR COST

Start-up FDF Labor Cost	0.5 years @ $13,822,536	$6,911,270
O&M FDF Labor Cost	3.0 years @ $13,822,536	$41,467,610
Total	3.5 years @ $13,822,536	$48,378,880

C.5.4.2.4.2 Material Cost

Material cost includes the costs for consumables (PPE, chemicals, filters office supplies, etc.), and equipment spare and replacement parts.

The following **Table C.5.4-4** is a summary of the annual cost for consumables and spare parts based on information from the *CNS POP Final Report* (**Appendix H, Attachment H4**) and the **Basis of Design and Description** (**Appendix G**).

TABLE C. 5.4-4
ANNUAL CONSUMABLE AND SPARE PARTS COST DATA

Spare Parts	$56,068	per year
Consumables	$1,470,579	per year
Total	$1,526,647	per year

<END O F PAGE>

Therefore, the total material cost is summarized in **Table C.5.4-5** as follows: 8113

TABLE C. 5.4-5
SUMMARY OF MATERIAL COSTS

Material	Expenditure	Cost
Spare Parts	$56,068 @ 3.5 years	$196,230
Consumables	$1,470,579 @ 3.5 years	$5,147,027
Total	$1,526,647 @ 3.5 years	$5,343,257

C.5.4.2.4.3 Utility Cost

Utility cost is the cost for utilities to support the start-up, proof of process, and operation of the Silos 1 and 2 material full-scale remediation activities. This cost includes electricity, natural gas, and oxygen. Cost of water is included in the FEMP site support cost, which is not included in this estimate.

The following **Table C.5.4-6** is a summary of the annual cost for utilities based on information from the *CNS POP Final Report* (**Appendix H, Attachment H4**) and **the Basis of Design and Description** (**Appendix G**).

TABLE C. 5.4-6
ANNUAL UTILITY COST FOR CHEMICAL STABILIZATION — OTHER

Electrical	15,776,900 kWhr	@.06/kWhr	$946,614	per year

<END OF PAGE>

Based on the Chemical Stabilization — Other operation and start-up schedule assumptions, the utility costs are summarized in **Table C.5.4-7**.

TABLE C. 5.4-7
UTILITY COST FOR CHEMICAL STABILIZATION — OTHER

O&M	$946,614 @ 3.0 years	$2,839,842
Start-up and Training	$946,614 @ 0.5 years	$473,308
Total Utility Cost	$946,614 @ 3.5 years	$3,313,150

C.5.4.2.4.4 Contractor's Technical Support Cost

The contractor's technical support cost includes the contractor's cost to support start-up and operation of the Silos 1 and 2 material full-scale treatment facility. This cost includes technology-specific laboratory support, training support labor, start-up technical oversight labor, and operational technical oversight labor.

The contractor's estimated total technical support cost for Chemical Stabilization — Other is based on the *CNS POP Final Report* **(Appendix H); it is summarized** in **Table C.5.4-8:**

TABLE C. 5.4-8
CONTRACTOR'S TOTAL TECHNICAL SUPPORT COSTS
CHEMICAL STABILIZATION – OTHER

Contractor Support for O&M	$2,208,960
Contractor Support for Start-up Cost	$1,154,320
Total Technical Support Cost	$3,363,280

C.5.4.2.4.5 Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the O&M of the Silos 1 and 2 material full-scale treatment facility.

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C.5.4.2.5 Methodology

The methods used to prepare the O&M cost estimate are discussed next.

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using the basis of design, preconceptual design drawings, and the technical judgement of senior FDF operation, maintenance, and waste management supervisory personnel. The FY99 plan labor rates were then applied to the estimated labor resources to obtain the FDF O&M labor cost estimate.

Material Cost

The material (consumables and spare parts) cost estimate is based on information provided by the POP contractor's final report.

Utility Cost

The utility cost estimate is based on information provided by the POP contractor's final report.

Contractor's Technical Support Cost

The contractor's technical support cost estimate is based on information provided by the POP contractor's final report.

<END OF PAGE>

Risk Budget

Risk budget is the cost allowance for risk and uncertainties associated with the O&M of the Chemical Stabilization — Other facility. The risk budget was developed following analyses of the probability of schedule delays based on technology, historical data and professional judgement (see **Table C.5.4-9**).

The O&M risk budget was determined to be 19% of operation, maintenance, and project management cost. The 19% risk factor is based on an operational schedule risk of 8.2 months of potential delay due to additional analytical laboratory support, waste loading and downtime associated with operational issues.

Secondary Waste Cost

The secondary waste cost is estimated as the volume of the spare parts, filter, and PPE material cost. All secondary waste is packaged and disposed at the NTS.

<END OF PAGE>

TABLE C. 5.4-9
OPERATION AND MAINTENANCE SCHEDULE RISK BUDGET
CHEMICAL STABILIZATION — OTHER (CHEM2)

Risk Activity	Schedule Delay of Risk Activity	Probability of Risk Activity
Dewatering difficulties	Takes longer to settle the slurry to the proper % solids. Schedule delay 2 months.	(75% x.2 = 1.5 months)
Fillhead alignment and sealing difficulty	Fillhead alignment and sealing difficulty is covered by the 70% availability	*(See note)
Feed Prep System clogging	Feed Prep System clogging (normal flushing and cleaning covered in the normal maintenance).	*(See note)
Remote handling issues	Remote handling hardware is not "off-the-shelf" standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Process control sampling and lab analysis delays	Lab analysis for formula validation (2 days to process sample & 7-day curing) if each tank has a weeks batch results in 1 day schedule delay per week or 3-month schedule delay.	(50% x 3 = 1.5 months)
Reduced waste loading	Reduced waste loading resulting in schedule delay 1.8 months (see below for details).	2.9 months
Total		8.15 months

CHEM2 Operational Risk Factor

8.15 months of potential delay/42-month operation and start-up period = 19%.
Note: 70% operation availability addresses the minor day-to-day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Schedule Risk Budget

CHEM2 assumes a reduction in waste loading from 24 wt% to 20 wt%.
Risk Budget Factor ➡ (24-20 wt%)/20 wt% ➡ 20% @ 40% probability = 8%.
Potential Schedule Delay ➡ 8% x 36 months of operation = 2.9 months.

C.5.4.2.6 References

The following references were used to prepare the O&M cost estimate:

- *Chem-Nuclear Systems POP Final Report* (**Appendix H, Attachment H4**); and
- **Basis of Design and Description (Appendix G).**

C.5.4.2.7 Attachments

Detailed O&M cost summaries for the Chemical Stabilization — Other (CHEM2) alternative, prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.5.4.I

O&M Cost Estimate Summary for

Chemical Stabilization — Other

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE N C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Operations & Maintenance Manpowe	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Operations & Maintenance Manpower														
21	Manpower	1	ls	3.00			13,822,536				41,467,610				$41,467,610
26	Spare Parts	1	ls	3.00					56,068				168,200		$168,200
28	Consumables	1	ls	3.00					446,693				1,340,080		$1,340,080
28	Filter elements	1	ls	3.00					15,600				46,800		$46,800
25	Electrical	1	ls	3.00					946,614				2,839,840		$2,839,840
29	Subcontractor Support	1	ls	1.00				2,208,960				2,208,960			$2,208,960
	O&M Startup Costs														
21	Manpower	1	ls	0.50			13,822,536				6,911,270				$6,911,270
26	Spare Parts	1	ls	0.50					56,068				28,030		$28,030
28	Consumables	1	ls	0.50					446,693				223,350		$223,350
28	Filter elements	1	ls	0.50					15,600				7,800		$7,800
25	Electrical	1	ls	0.50					946,614				473,310		$473,310
24	Startup costs	1	ls	1.00				1,154,322				1,154,320			$1,154,320
22.a	Secondary Waste to OTHER	1	ls									$682,244			$682,244
31	Secondary Waste to NTS	1	ls									$574,323			$574,323

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OPERATIONS CONSUMABLES AND MATERIAL COST

Spare Parts	$	56,068.00	per year
Consumables	$	446,693.00	per year
Filter elements	$	15,600.00	per year
PPE and supplies	(see attached detail)		

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Operation and Maintenance
PPE and Supplies
Calculations

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PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

SITE SPECIFIC

EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			70.0%	20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
	<---- MULTIPLE SHIFTS-											
WORK WEEK							4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK	//// MULTIPLE-SHIFT ////			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK			OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK							OR					
2ND SHIFT					2ND SHIFT		ONE SHIFT ONLY			100.0%	3.0%	0.03
3RD SHIFT			3RD SHIFT							100.0%	5.0%	0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	87.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 87.4%

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.14

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EFFICIENCY FACTORS

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PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
ENT: DOE
S NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	14%	14.0
S/T = BASE UNIT MANHOURS		114
OVERTIME PRODUCTIVITY FACTOR	0.00%	0
(SEE DETAIL WORKSHEET BACK-UP)		114
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		114

• PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	4.00%	5	71.00%	81	79.00%	90	147.00%	168	326.00%	372
S A MULTIPLIER)/TOTAL HRS	1.04	118.6	1.71	194.9	1.79	204.1	2.47	281.6	4.26	485.6
TAL MULTIPLIER w/SITE PROD.	1.1856		1.9494		2.0406		2.8158		4.8564	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

12.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	49.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

JJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05[illegible]99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.04	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR			D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's			600	600	600	600	600
ADDITN'L.SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's		QUANTITY	1	1	1	1	1
		MINUTES	25	25	25	25	25
TOTAL			25	25	25	25	25
PPE DON & DOFFING		QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)		MINUTES	0	15	15	20	25
TOTAL				60	60	80	100
WORK BREAKS		QUANTITY	N/A	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)		MINUTES	N/A	15	15	15	15
TOTAL			0	30	30	30	45
MOBILIZATION - ROUND TRIPS		QUANTITY	N/A	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)		MINUTES	N/A	15	15	15	15
TOTAL			0	60	60	60	60
COOLDOWNS PER DAY		QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS)	33.33%	MINUTES	N/A	15	15	15	15
TOTAL			0	20	20	40	40
AIR TANK REPLACEMENT		QUANTITY	N/A	N/A	N/A	4	4
		MINUTES	N/A	N/A	N/A	10	10
TOTAL			0	0	0	40	40
AVAILABLE WORK TIME			575	405	405	325	290
AVAILABLE WORK TIME FACTOR			0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

8113

OJECT: Silos 1 & 2 Chemical Stabilization (FS)

ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

CAPITAL PLANT

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	0	$0	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	4	0	$0	C / C+/ B	
SUB-TOTAL		22.18	4		$0		
				$/MD =	$0.00		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	4	0	$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	0	$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	0	$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	0	$0	mC
SUB-TOTAL		5.98	4		$0	
				$/MD =	$0.00	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	48	$3,658	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	48	$39,600	C/B
THERMO STRIPS	EA	50.00	6	48	$14,400	C/B
SUB-TOTAL					$57,660	

MAT'L.$'s
$57,700

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)

TIMATE NO.: C4981004
IENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

CAPITAL PLANT
--MEDICAL MONITORING --

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	147	588	$21.92	$12,890
ANNUAL PHYSICALS	1	4	147	588	$21.92	$12,890
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	147	147	$21.92	$3,220
SUB-TOTAL						$29,000

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	147	1320	$21.92	$28,940
SUB-TOTAL						$28,940

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s	
11	219	2	438	$21.92	$9,600	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	147	0.6468	339

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	0.0%	$7,559,693	$0
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	$7,559,693	$151,200

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$218,700	$57,700	$276,400

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ACTIVITY DURATIONS

8113

FLUOR DANIEL FERNALD

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE NO.: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	18-Dec-98	01-Jan-2000	30-Sep-2000	30-Jun-2001	18.0	MONTHS
					0	MONTHS
TOTAL					18.0	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	21.4	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
		01-Jan-2002	03-Jul-2003	01-Jan-2005	36.1	MONTHS
OPERATIONS					36.1	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

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HEALTH PHYSICS

8113

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ESTIMATE NOC4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P PLANT OPERATIONS

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY WKR.SHFT. = 182/WK for 3.50 YR DURATION				
PPE LEVEL C / C+ / B : F/HF M		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	31630	$564,275	C / C+/ B	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	31630	$564,275	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	31630	$30,365	C / C+/ B	
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	31630	$32,895	C / C+/ B	
GLOVE, WORK - DISPOSABL	PR	1.02	4	31630	$129,050	C / C+/ B	
APR CARTRIDGES - DISPOSA	PR	11.74	4	31630	$1,485,334	C / C+/ B	
SUB-TOTAL		22.18	4		$2,806,194		
				$/MD =	$88.72		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVER	PR	4.46	4	63260	$1,128,551	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	63260	$60,729	mC
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	63260	$65,790	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	63260	$258,099	mC
SUB-TOTAL		5.98	4		$1,513,169	
				$/MD =	$23.92	

SUBCONTRACTOR REQUIRED	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR	PR	12.70	6	135	$10,287	D/C/B
APR w/HALF FACE MASK - (1	EA	22.30	6	67.5	$9,032	C
APR w/FULL FACE MASK - (1	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	33.75	$27,844	C/B
THERMO STRIPS	EA	50.00	6	13.5	$4,050	C/B
SUB-TOTAL					$51,210	

MAT'L.$'s
$4,370,600

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE.
COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)

ESTIMATE NO C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 05-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PLANT OPERATIONS
--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	180	720	$21.92	$15,780
ANNUAL PHYSICALS	4	4	180	2880	$21.92	$63,130
EXIT (TERMINATION) PHYSIC	1	1	180	180	$21.92	$3,950
SUB-TOTAL						$82,860

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	180	1616	$21.92	$35,430
SUB-TOTAL						$35,430

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	627	2	1254	$21.92	$27,500

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	180	0.792	792

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY	0.0%	$41,467,610	$0
			LABOR $'s
WORK DELAYS CAUSED BY	1.0%	$41,467,610	$414,700

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$560,500	$4,370,600	$4,931,100

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HEALTH PHYSICS

8113

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ESTIMATE NOC4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P PLANT OPERATIONS

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY WKR.SHFT. = 182/WK for 3.50 YR DURATION				
PPE LEVEL C / C+ / B : F/HF M		$'s	*	MAN DAYS	MAT'L.$'s	LEVEL	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	20872	$372,351	C / C+/ B	
TYVEK COVER-ALL w/HOOD	EA	4.46	4	20872	$372,351	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	4	20872	$20,037	C / C+/ B	
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	20872	$21,707	C / C+/ B	
GLOVE, WORK - DISPOSABL	PR	1.02	4	20872	$85,157	C / C+/ B	
APR CARTRIDGES - DISPOSA	PR	11.74	4	20872	$980,136	C / C+/ B	
SUB-TOTAL		22.18	4		$1,851,739		
				$/MD =	$88.72		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	LEVEL
LT.WT. DISPOSABLE COVER	PR	4.46	4	41743	$744,703	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	41743	$40,074	mC
GLOVE, LASTEX - DISPOSAB	PR	0.26	4	41743	$43,413	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	41743	$170,313	mC
SUB-TOTAL		5.98	4		$998,503	
				$/MD =	$23.92	

SUBCONTRACTOR REQUIRED	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR	PR	12.70	6	133.65	$10,184	D/C/B
APR w/HALF FACE MASK - (1	EA	22.30	6	66.825	$8,941	C
APR w/FULL FACE MASK - (1	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	33.4125	$27,565	C/B
THERMO STRIPS	EA	50.00	6	13.365	$4,010	C/B
SUB-TOTAL					$50,700	

MAT'L.$'s
$2,900,900

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)

ESTIMATE NO: C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

PLANT OPERATIONS
--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	178	713	$21.92	$15,630
ANNUAL PHYSICALS	4	4	178	2851	$21.92	$62,510
EXIT (TERMINATION) PHYSIC	1	1	178	178	$21.92	$3,910
SUB-TOTAL						$82,050

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	9	1	178	1600	$21.92	$35,090
SUB-TOTAL						$35,090

RANDOM DRUG TESTING

WKRS	TESTS	HRS			LABOR $'s
11	621	2	1242	$21.92	$27,200

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	178	0.78408	792

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY	0.0%	$48,378,880	$0
			LABOR $'s
WORK DELAYS CAUSED BY	1.0%	$48,378,880	$483,800

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$628,100	$2,900,900	$3,529,000

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OPERATIONS UTILITY COST

Electrical	15,776,900	.06 KW/hr	$	946,614.00	per year	(See Appendix G for Details)
Water	400 g/day		Cost covered by Site Hotel Cost			

Estimated Secondary Waste Streams Generated During Full-scale of the Remediation Facility for Silos 1 & 2 Project

Chemical Stabilization - Other

Source	Material Type	Total Volume 3 Years	Packaged Disposal Volume in CF	Shipped to	No. of LMB
Empty Re-Work Containers	Steel	362,748 lbs / 737 cf	2,016	NTS	11
Misc. Replacement Equipment	Solid	14 cf	112	NTS	1
PPE	Solid	21,600 cf	32,000	NTS	32

Estimated Secondary Waste Streams Generated During Full-scale of the Remediation Facility for Silos 1 & 2 Project

Chemical Stabilization - Other

Source	Material Type	Total Volume 3 Years	Packaged Disposal Volume in CF	Shipped to	No. of LMB
Empty Re-Work Containers	Steel	362,748 lbs / 737 cf	2,016	NTS	11
Misc. Replacement Equipment	Solid	14 cf	112	NTS	1
PPE	Solid	21,600 cf	32,000	NTS	32

Freight per Container to NTS	$3,453	Container(s) to NTS	44	$151,923	
Container Burial NTS	$9,600	Container(s) Burial NTS	44	$422,400	
			NTS Total	$574,323	

Source	Material Type	Total Volume 3 Years	Shipped to	Container Type	Total Dollars
Category C (HEPA filters)	Solid	8,473 kg	other	B-25 boxes	$107,921
				Other Total	$107,921

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Total Secondary Waste Cost	$682,244

CHEMICAL STABILIZATION - OTHER

The Department of Energy Oak Ridge Operations
Mixed Waste Disposal under DOE contract
DE-AC0594OR22074

Disclaimer: This should be used for cost estimation purposes only.

Category C Estimate (HEPA filters)

Material:	Debris
Weight of Material:	8473 kg
Container Type:	B-25 Boxes
Treatment Cost:	$51,515.84
Disposal Cost:	$13,993.16
Handling Price:	$6,825.00
Transportation Cost:	$35,586.60
Total:	$107,920.60

Estimated Secondary Waste Streams Generated During Full-scale Operation of the Remediation Facility for Silos 1 and 2 Project

Secondary Waste Streams for CHEM 2					
Source	**Material Type**	**Rate (lb/day)**	**Total Volume**	**Status**	**Packaged Disposal Volume**
RCS Condensate	Water	50	1,310,400 gal	Process	N/A
Empty Re-work Containers	Steel	57	362,748 lbs 737 cf	Dispose	2,016 cf
Misc. Replacement Equipment [1]	Solid	N/A	14 cf	Dispose	112 cf
RCS and Emissions System HEPA filters	Solid	N/A	1,656 cf	Dispose	3,190 cf
RCS carbon	Carbon	1 Lot	5,334 cf	Dispose	8,890 cf
PPE [2]	Solid	4 / day	21,600 cf	Dispose	32,000 cf
Total Estimated Cubic Feet of Packaged Disposed Secondary Waste					46,000 cf

1 - Equipment will be replaced when necessary to maintain normal operation schedule.
2 - Based on the assumption of four complete changes per person per shift.

Revised 11/10/1999 mkm

Chemical Stabilization-Other (Chem 2)
Operation and Maintenance Risk Budget

Risk Activity	Schedule delay of Risk Activity	Probability of Risk Activity
Dewatering difficulties	Takes longer to settle the slurry to the proper % solids. Schedule delay 2 months.	(75% x 2 = 1.5 months)
Fillhead alignment and sealing difficulty	Fillhead alignment and sealing difficulty is covered by the 70% availability.	• (See Note)
Feed prep system clogging	Feed prep system clogging (normal flushing and cleaning covered in the normal and off-shift maintenance .	• (See Note)
Remote handling issues	Remote handling hardware is not off-the shelf standard and replacement is expected 3 months.	(75% x 3 = 2.25 months)
Process Control sampling and lab analysis delays	Lab analysis for formula validation (2 days to process sample & 7 day curing) if each tank has a weeks batch results in 1 day schedule delay per week or 3 month schedule delay.	(50% x 3 = 1.5 months)
Reduce waste loading	Reduce waste loading resulting in schedule delay 2.9 months see below for details.	2.9 months
Total		8.15 months of potential delay

Chem 2 Operational Risk Factor

8.15 months of potential delay/42 month operation and startup period = 19%

Note: 70% operation availability addresses the minor day to day operation and maintenance problems.

Waste Disposal, Packaging and Shipping Risk Budget

Chem 2 assume a reduction in waste loading from 24wt% to 20wt%

Risk Budget Factor = 24-20/20 = 20% @ 40% probability = 8%

8% x 36 months of operation = 2.9 months of potential delay

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C.5.5 Decontamination and Demolition Estimate Basis: Chemical Stabilization — Other

C.5.5.1 Introduction

The D&D costs for the Chemical Stabilization — Other alternative (CHEM2) are summarized in **Table C.5.5-1**.

TABLE C. 5.5-1
D&D COST
CHEMICAL STABILIZATION — OTHER

Chemical Stabilization — Other D&D Cost	$12,737,400
Silos Project Support Area D&D Cost	$ 10,468,800
D&D NTS Disposal Cost	$11,808,203
D&D Risk Budget	$ 1,342,200
Total D&D Cost Estimate	$36,356,603

<END OF PAGE>

C.5.5.2 Estimate Basis

The cost estimate basis for the D&D cost of the Chemical Stabilization — Other alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.5.5.2.1 Assumptions

The following general assumptions were used in the preparation of the estimates:

1. Costs are expressed in FY99 dollars.
2. D&D waste is sent to the NTS for disposal.
3. Labor costs are based on four crews working a 40-hr/week, 10-hr/day schedule, without any allowance for premium time.
4. Construction management staff is dedicated 100% to supporting D&D of the proposed facility.

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C.5.5.2.2 Inclusions

The D&D cost estimate includes the following elements:

- Cost of demolition labor;
- Cost of FDF construction management dollars above- and below-grade;
- Waste packaging and transportation labor;
- Below-grade D&D of concrete and underground utilities;
- Above-grade D&D;
- RCS/TTA building D&D;
- FDF D&D planning & engineering;
- Equipment rental dollars; and
- Subcontractor staffing costs.

C.5.5.2.3 Exclusions

The D&D cost estimate excludes the following elements:

- Premium time cost for overtime; and
- Security, fire department, human resources, etc.

C.5.5.2.4 Format and Coding

The D&D cost estimates are compiled and summarized into the following cost centers:

- Chemical Stabilization — Other D&D;
- Silos project support area D&D;
- D&D NTS disposal; and
- D&D risk budget.

C.5.5.2.4.1 Chemical Stabilization — Other D&D Costs

This is the cost associated with the D&D of the Chemical Stabilization — Other facility. This cost is based on the **Basis of Design and Description (Appendix G)** and FEMP D&D experience.

C.5.5.2.4.2 Silos Project Support Area D&D Costs

Silos project support area D&D costs include the costs associated with the D&D of the silos areas support facilities (TTA, RCS). This cost estimate is based on information from the AWR preconceptual design provided with the contractor's final report and FEMP D&D experience.

C.5.5.2.4.3 D&D NTS Disposal Costs

D&D NTS disposal costs are the costs for disposal of all D&D debris from the D&D of the Chemical Stabilization — Other facility, the TTA, and RCS.

C.5.5.2.4.4 D&D Risk Budget

The D&D risk budget is a cost allowance for the risks and uncertainties associated with D&D activities. The cost risk budget for D&D is 6%, which is based on the risk analysis of other FEMP D&D projects.

C.5.5.2.5 Methodology

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with D&D of the Silos 1 and 2 material remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates. An activity-based level-of-effort support estimate was developed using preconceptual design drawings and materials of construction from the **Basis of Design and Description (Appendix G)**, and technical judgement of senior FDF D&D and waste management supervisors.

Wage Rates

Wage rates are based on project labor agreement rates, effective October 1998, and are considered FY99 dollars for estimating purposes.

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Unit Rates

Unit mhrs, equipment, and material dollars are based on estimating guides and FEMP historical data rates.

Risk Budget

Risk budget is added to the estimate to provide for risks and uncertainties associated with the D&D of the Silos 1 and 2 material full-scale treatment facility.

C.5.5.2.6 References

Basis of Design and Description (Appendix G).

C.5.5.2.7 Attachment

Detailed D&D cost summaries for the Chemical Stabilization —Other alternative (CHEM2), prepared by the FDF cost estimating team, are attached to this section.

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Attachment C.5.5.I

D&D Cost Estimate Summary for

Chemical Stabilization — Other

ESTIMATE SUMMARY SHEET

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
Mobilizaton Cost	820		$17,400		$13,800	$800	$32,000
Below Grade	9,985		$202,200				$202,200
Above Grade	38,462		$778,690				$778,690
Demobilization Cost	1,780		$36,400	$8,200	$2,500	$4,900	$52,000
DIRECT FIELD COSTS TOTAL	51,047	$20.27	$1,034,690	$8,200	$16,300	$5,700	$1,064,890
SUPERVISION - CONTRACTOR & PERDIUM	19,040		$453,900	$144,000			$597,900
SMALL TOOLS & CONSUMABLES 3%					$31,000		$31,000
EQUIP. RENTAL (See Equipment Schedule)						$743,700	$743,700
TEMPORARY FACILITIES 6%	1,531		$31,000		$31,000		$62,000
TEMPORARY UTILITY HOOK-UP 3%	995		$20,200		$10,900		$31,100
JOB CLEAN-UP 6%	2,297		$46,600		$15,500		$62,100
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)							
HEALTH PHYSICS S/C	2,210		$44,800		$139,400		$184,200
CERCLA - 40 HRs/FTE	1,300		$26,400				$26,400
GET/SITE ACCESS & JOB SPECIFIC TRAINING	936		$19,000				$19,000
PAYROLL BURDENS & BENEFITS 57%	-	-	$955,700				$955,700
OVERHEAD & PROFIT 20%	-	-		$755,600			$755,600
BOND 1%	-	-		$45,300			$45,300
SALES TAX 6%	-	-			$14,600	$45,000	$59,600
INDIRECT FIELD COSTS TOTAL	28,310		$1,597,600	$944,900	$242,400	$788,700	$3,573,600
DIRECT & INDIRECT FIELD COSTS TOTAL	79,357	$33.17	$2,632,290	$953,100	$258,700	$794,400	$4,638,490
WASTE DISPOSITION MGMT. - FD FERNALD			$1,105,486	$1,850,733	$2,706,122	$43,984	$5,706,324
OFF-SITE DISPOSAL COSTS (Commercial)							
WASTE MANAGEMENT COSTS TOTAL			$1,105,486	$1,850,733	$2,706,122	$43,984	$5,706,324
PROJECT CLOSE OUT			$85,826	$15,076			$100,902
FIELD PREPARATION							
CONSTRUCTION MANAGEMENT - FD FERNALD			$1,726,985	$210,347	$47,779		$1,985,111
FD FERNALD FIELD SUPPORT COSTS TOTAL			$1,812,811	$225,424	$47,779		$2,086,013
ENGINEERING/DESIGN/INSPECTION - FD FERNALD			$124,815	$9,718	$6,826		$141,359
ENGINEERING COSTS TOTAL			$124,815	$9,718	$6,826		$141,359
SALES TAX - FD FERNALD							$165,200
SUB-TOTAL (BASE ESTIMATE)							$12,737,400
RISK BUDGET 9.7%							$1,235,500
TARGET ESTIMATE (FY 99 DOLLARS)							$13,972,900
CONTINGENCY10.8%							$1,375,600
NTS BURIAL FEE							$5,145,689

ESTIMATE PERFORMED BY ESTIMATING SERVICES

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ESTIMATE SUMMARY SHEET

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FER[illegible]
TASK NO.: 4S1[illegible]

FACTORS

FIXED PRICE SUBCONTRACT	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TO[illegible]$
DFC DOLLARS	$1,034,690	$8,200	$16,300	$5,700	$139,400	$1,204,290
IFC COST FACTOR	2.5440	18.5610	6.4233	131.4737	--	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2087	1.2087	1.2087	1.2087	1.2087	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	3.0750	22.4346	8.2297	168.4468	1.2812	
BASE ESTIMATE $'s	$3,181,645	$183,964	$134,144	$960,147	$178,602	$4,638,502
RISK BUDGET FACTOR	1.0970	1.0970	1.0970	1.0970	1.0970	
TARGET ESTIMATE FACTOR	3.3732	24.6108	9.0280	184.7861	1.4055	
FPS TARGET ESTIMATE (FY99 DOLLARS)	$3,490,265	$201,808	$147,156	$1,053,281	$195,927	$5,088,437

NOTE:
1.)The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe. SEE De-Escalated Summary.
2.) If there are no DFC Equip. $, enter The IFC Equip. $'s into the direct field cost TOTAL and delete IFC Factor in G65.
3.) If FD Fernald Support dollars appear below, and were generated as a percenatage of the DFC, Risk Budget would apply and these dollars would be de-escalated to FY96. Indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the NO box.
If the FDF Support costs are supported by LOE estimates, use those estimates for input to microframe, enter 'SPACE BAR' in the Yes Box and an X in the N

DOES RISK BUDGET APPLY TO FD FERNALD SUPPORT COSTS	YES	NO
		X

FD FERNALD SUPPORT COSTS	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
FD FERNALD PROJECT MGMT.						$100,902
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM						$100,900
FD FERNALD CONSTRUCTION MGMT.						$1[illegible]11
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	[illegible]00
TOTAL CM						$1[illegible]10
FD FERNALD WASTE PROGRAM MGMT.						$5,706,324
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM						$5,706,320
FD FERNALD RSO						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO						
FD FERNALD ENGINEERING/DESIGN/INSPECTION						$124,815
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.						$124,820
A/E ENGINEERING/DESIGN/INSPECTION						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E						
SUB-TOTAL PROJECT TARGET EST. (FY99 DOLLARS)						$13,005,587

If FDF Support Costs were based on % defaults, indicate 'Yes' above. These costs are considered FY99 $'s and Risk Budget applies.

If FDF Support Costs were based on LOE estimates provided by the CAM's, indicate 'NO' and escalate the LOE dollars to FY99. (x 1.079)
Risk Budget will NOT apply. Separate the Sales Tax below.

The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

OTHER FD FERNALD SALES TAX - 6%						
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER FD FERNALD SALES TAX						

TOTAL PROJECT TARGET EST. (FY99 DOLLARS)	$13,005,587

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ESTIMATE SUMMARY SHEET

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

Direct Field Cost w/FACTORS AND RISK BUDGET

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YES	NO
X	

DATE: 16-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PAY ITEM NO.	DESCRIPTION	LABOR $	S/C $	MAT'L. $	EQUIP. $	PPE $	TOTAL $
						139400	
	Mobilizaton Cost	17400		13800	800	139400	171400
		$58,690		$124,590	$147,830	$195,930	$527,040
	Below Grade	202200					202200
		$682,070					$682,070
	Above Grade	778690					
		$2,626,710					$2,626,710
	Demobilization Cost	36400	8200	2500	4900		
		$122,790	$201,810	$22,570	$905,450		$1,252,620
	TOTAL DIRECT FIELD COSTS w/FACTORS		(FY99 DOLLARS)				$5,088,440

NOTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

CONTAINER PURCHASE & PREPARATION

Labor — 4 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	0.25	$9.17
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28
WASTE - Planner	$37.12	1.00	$37.12
IH - Industrial Hygiene	$25.93	0.00	$0.00
MVOH - HEO	$25.71	4.00	$102.85
MVOH - HAZWAT	$25.71	4.00	$102.85
QA - Performance/QA	$37.30	0.50	$18.65
Total Labor/Container	$27.99	10.00	$279.92

Material

Description	Rate	Qty	Total
Misc - Caulk, banding	$12.79	5	$63.93
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00
Reconditioned L-WMB Container	$4,779.37	1	$4,779.37
Total Material/Container			$4,843.30

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.25	$9.71
Tractor	$38.84	0.25	$9.71
Forktruck	$10.79	0.25	$2.70
Flatbed trailer	$16.19	0.25	$4.05
Total Equipment/Container			$26.17
Total Container Purchase & Preparation			$5,149.38

CONTAINER PACKAGING

Labor — 2 PER DAY

Description	Rate	Hours	Total
MAINT - Ops Supv	$36.69	1.00	$36.69
WASTE - Waste Tech	$37.12	4.00	$148.47
CLRK - MC&A Clerk	$19.62	0.25	$4.90
RAD - Rad Tech	$28.56	4.00	$114.24
MVOH - HEO	$25.71	8.00	$205.70
MVOH - HAZWAT	$25.71	8.00	$205.70
QA - Performance/QA	$37.30	1.00	$37.30
Total Labor/Container	$28.69	26.25	$753.01

PPE Material $'s

Description	Rate	Qty/day/wkr	Total
Protec Coveralls	$5.72	4	$22.87
Protec shoe covers	$0.42	4	$1.68
Powdered latex gloves	$0.07	4	$0.28
Cotton glove liners	$0.41	4	$1.64
Leather Gloves	$3.05	4	$12.21
Respirator Catridges	$4.75	4	$18.99
Total PPE Material/wkr/day			$57.68
Total PPE Material/container	6	wkrs	$173.05

Equipment

Description	Rate/Day	Days	Total
Trackhoe w/grappler	$38.84	0.5	$19.42
Forktruck	$10.79	0.5	$5.40
Total Equipment/Container			$24.82
Total Packaging			$950.87

CONTAINER STAGING

Labor

Description	Rate	Hours	Total
CLRK - Data Entry Clerk	$19.62	0.25	$4.90
CLRK - MC&A Clerk	$19.62	2.00	$39.23
QA - Performance/QA	$37.30	1.00	$37.30
MAINT - Shipping Supv	$36.69	0.50	$18.34
WASTE - Waste Tech	$37.12	4.00	$148.47
RAD - Rad Tech	$28.56	2.00	$57.12
WASTE - Shipping Coord	$37.12	1.00	$37.12
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	4.00	$102.85
Total Labor per Truckload	$29.99	15.25	$457.41
Total Labor per Container	1	/truck	$457.41

Material

Description	Rate	Qty	Total
Barcode labels	$0.30	2	$0.60
Container seals	$0.28	1	$0.28
Laminate for labels	$0.46	2	$0.93
Total Material/Container			$1.81

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Staging			$474.76

CONTAINER SHIPPING PREPARATION

Labor

Description	Rate	Hours	Total
MAINT - Traffic Coord	$36.69	2.00	$73.37
CLRK - MC&A Clerk	$19.62	3.00	$58.85
QA - Performance/QA	$37.30	4.00	$149.20
RAD - Rad Tech	$28.56	3.17	$90.54
WASTE - Shipping Coord	$37.12	0.10	$3.71
MAINT - Transportation	$36.69	1.50	$55.03
UTIL - Warehouse Attendant	$24.14	0.50	$12.07
MVOH - HAZWAT	$25.71	0.75	$19.28
MVOH - MVO	$25.71	1.50	$38.57
CRFT - Carpenter	$27.32	0.50	$13.66
UTIL - Laborer	$24.14	1.00	$24.14
MVOH - HEO	$25.71	1.00	$25.71
UTIL - Mechanic	$24.14	0.33	$7.97
Total Labor/Truckload	$29.57	19.35	$572.10
Total Labor per Container	1	/truck	$572.10

Material

Description	Rate	Qty	Total
Placards	$0.38	4	$1.51
Trailer seals	$0.28	1	$0.28
Wood bracing 2x4 - LF	$0.65	40	$25.90
Paint	$17.26	0.1	$1.73
Banding	$0.05	20	$1.08
Total Material/Container			$30.49

Equipment

Description	Rate/Day	Days	Total
Taylor - forktruck	$38.84	0.2	$7.77
Tractor	$38.84	0.2	$7.77
Total Equipment/Container			$15.54
Total Shipping Preparation			$618.13

CONTAINER SHIPPING - FREIGHT

Flatbed to Nevada Test Site			$3,452.80
Total Freight per Container	1	/truck	$3,452.80

Total Waste Mgmt. Cost/TOP LOADING ISO	$10,645.94

Container Burial - NTS	Rate	Vol cu ft	Total
Top Loading L-WMB Container	$7.50	1,280	$9,600.00

****All costs are in stated in FY99 Dollars.****

Multiply these dollars by 0.9268 to = FY96 $'s for Input to MF.
Performed by Estimating Services

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

LOE SUMMARY INPUT - DEESCALATED TO FY96 DOLLARS

Labor Description	FY99 Rate	Hours	FY99 Total	0.9268	FY96 $'s	NO. of CONTAINERS	536	TOTAL FY96 $'s
MAINT - Ops Supv	$36.69	1.25	$45.86		$42.50			
MAINT - Shipping Supv	$36.69	0.50	$18.34		$17.00			
MAINT - Traffic Coord	$36.69	2.00	$73.37		$68.00			
MAINT - Transportation	$36.69	1.50	$55.03		$51.00			
MAINT		5.25	$192.60		$178.50	536		$95,677.65
WASTE - Mgr LLW Packaging	$37.12	0.25	$9.28		$8.60			
WASTE - Planner	$37.12	1.00	$37.12		$34.40			
WASTE - Waste Tech	$37.12	8.00	$296.94		$275.20			
WASTE - Shipping Coord	$37.12	1.10	$40.83		$37.84			
WASTE		10.35	$384.17		$356.05	536		$190,840.72
IH - Industrial Hygiene	$25.93	0.00	$0.00		$0.00			
Industrial Hygiene		0.00	$0.00		$0.00			
QA - Performance/QA	$37.30	6.50	$242.46		$224.71			
QA		6.50	$242.46		$224.71	536		$120,443.95
RAD - Rad Tech	$28.56	9.17	$261.91		$242.73			
RAD		9.17	$261.91		$242.73	536		$130,105.46
CRFT - Carpenter	$27.32	0.50	$13.66		$12.66			
CRFT		0.50	$13.66		$12.66	536		$6,785.88
MVOH - HEO	$25.71	13.00	$334.26		$309.80			
MVOH - HAZWAT	$25.71	16.75	$430.69		$399.16			
MVOH - MVO	$25.71	1.50	$38.57		$35.75			
MVOH		31.25	$803.52		$744.70	536		$399,159.37
UTIL - Warehouse Attendant	$24.14	1.00	$24.14		$22.37			
UTIL - Laborer	$24.14	1.00	$24.14		$22.37			
UTIL - Mechanic	$24.14	0.33	$7.97		$7.38			
UTIL		2.33	$56.24		$52.12	536		$27,937.93
CLRK - MC&A Clerk	$19.62	5.25	$102.99		$95.45			
CLRK - Data Entry Clerk	$19.62	0.25	$4.90		$4.55			
CLRK		5.50	107.89		$99.99	536		$53,595.56
TOTAL LABOR HOURS & DOLLARS		70.85	$2,062.44		$1,911.47	536		$1,024,546.51
Misc. Material								
Description	Rate	Qty	Total					
			$0.00		$0.00			
Misc - Caulk, banding	$12.79	5	$63.93		$59.25			
4' x 20' Rad Pad Roll Sheets	$0.00	10	$0.00		$0.00			
Barcode Labels	$0.30	2	$0.60		$0.56			
Container Seals	$0.28	1	$0.28		$0.26			
Laminate for Labels	$0.46	2	$0.93		$0.86			
Placards	$0.38	4	$1.51		$1.40			
Trailer Seals	$0.28	1	$0.28		$0.26			
Wood bracing 2x4 - LF	$0.65	40	$25.90		$24.00			
Paint	$17.26	0.1	$1.73		$1.60			
Banding	$0.05	20.0	$1.08		$1.00			
TOTAL MISC. MATERIAL DOLLARS		85.10	$96.23		$89.19	536		$47,804.78
Container Purchase - Material								
Reconditioned L-WMB Container	$4,779.37	1.00	$4,779.37		$4,429.52			
TOTAL CONTAINER PURCHASE DOLLARS		1.00	$4,779.37		$4,429.52	536		$2,374,220.68
Equipment								
Description	Rate/Day	Days	Total					
Taylor - forktruck	$38.84	0.65	$25.25		$23.40			
Tractor	$38.84	0.65	$25.25		$23.40			
Forktruck	$10.79	0.75	$8.09		$7.50			
Flatbed Trailer	$16.19	0.25	$4.05		$3.75			
Trackhoe w/grappler	$38.84	0.50	$19.42		$18.00			
TOTAL EQUIPMENT DOLLARS		2.80	$82.06		$76.05	536		$40,763.50
PPE MATERIAL COST								
Description	WKR/DAY	$/DAY	Total					
Total PPE Material/container	6	57.68	$173.05		$160.38			
					$160.38	536		$85,965.18
CONTAINER SHIPPING - FREIGHT								
Flatbed to Nevada Test Site			$3,452.80		$3,200.06	536		$1,715,229.50
TOTAL FDF WASTE MGMT. COSTS		FY99	$10,645.94		FY96 $'s	536		$5,288,530.14
TOTAL DOE NTS BURIAL FEE COSTS		1280.00	686080	cu.ft.		536	$6.95	$4,788,942.08

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Waste Management Costs

TOP-LOADING LWMB & ISO CONTAINER

ASSUMPTIONS

CONTAINER PREPARATION:

a. Four containers can be prepared per day.
b. Containers are reconditioned and the prices reflect the current acquisition contract costs.

CONTAINER PACKAGING:

a. Two containers can be packaged per day.
b. PPE quantities are for six workers.
c. PPE pricing is based on unit costs from the Lab Safety catalog and escalated to FY98 dollars.

CONTAINER STAGING:

a. The labor to stage containers to load on a flatbed truck. Divide by containers / truck load. For this study, assume 1 container per truck load.
b. The material and equipment costs are for one container.

CONTAINER SHIPPING PREPARATION:

a. The labor to prepare and load a flatbed truck. Divide by containers per truck load. For this study assume 1 container per truck load. (42,000# gross weight)
b. The material and equipment costs are for one container.

CONTAINER SHIPPING FREIGHT:

a. Shipping charges are based on an avg. of three carrier contract rates currently being used at the site.
b. NTS burial costs are the anticipated FY98 rates that include shipping scrap copper volumes. If this does not happen, rates could be as high as $12.50 per cubic foot.

LABOR:

a. These costs are for direct field/operations costs. Project management costs are excluded.
b. Labor dollars are based on the FY99 Replan rates and are considered FY98 dollars.

EQUIPMENT:

a. Equipment dollars are for maintenance costs only. Any purchase cost and fuel usage have been excluded.

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D & D Chemical Stabilization

Unbulked Material Estimates (ft3)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
D&D Chemical Stabilization	106,773		135,262					5,442		247,477
Total	**106,773**		**135,262**				**0**	**5,442**		**247,477**

D & D Chemical Stabilization

Bulked Material Estimates (ft3)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
D&D Chemical Stabilization	363,028		175,841					10884		549,753
Total	**363,028**		**175,841**				**0**	**10,884**		**549,753**
Container	ROB		ROB				ROB			
Quantity	448.18296		434.174					13.437		
Disposition	OSDF		OSDF				OSDF	OSDF		

549,753 / 1,025 = 536 ALL BOXES TO NTS

D & D Chemical Stabilization

Material Weight Estimates (Tons)

Category	A,B & D	C	E	F	G	H	I		J	
Component Designation	Metals	Process Related Metals	Concrete	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. I-2	Misc. I-4	Lead Flashing	Component Total
D&D Chemical Stabilization	4,538		8,792				0	82		13,412
Total	**4,538**		**8,792**				**0**	**82**		**13,412**

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DEBRIS BULKING FACTORS

* A - Accessible Metals (OSDF 2)
  Bulking Factor 3

* B - Inaccessible Metals (OSDF 2)
  Bulking Factor 3

* C - Process-Related Metals
  Bulking Factor 3

* D - Light-Gauge Metals (OSDF 2)
  Bulking Factor 2

* E - Concrete (OSDF 2)
  Bulking Factor 1.3

* G - Non-Regulated ACM (OSDF 2/3)
  Bulking Factor 1.2

* H - Regulated ACM (OSDF 5)
  Bulking Factor 3

* I - Miscellaneous Debris (OSDF 2/4)
  Bulking Factor 3.5

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilizaton Cost				820						17,400		13,800	800	$32,000
	Below Grade Product Hand'l&Storage				5,026						101,780				$101,780
	Below Grade Analytical Lab				54						1,090				$1,090
	Below Grade Mech/Elect				550						11,140				$11,140
	Below Grade Warehouse				724						14,660				$14,660
	Below Grade Additive Storage				331						6,710				$6,710
	Below Grade On-Site Storage				2,906						58,840				$58,840
	Below Grade Site Work				228						4,610				$4,610
	Below Grade Interconnecting Facility				166						3,370				$3,370
	Above Grade Product Hand'l&Storage				14,354						290,650				$290,650
	Above Grade Analytical Lab				594						12,020				$12,020
	Above Grade Mech/Elect				1,704						34,510				$34,510
	Above Grade Warehouse				506						10,230				$10,230
	Above Grade Control Room				80						1,610				$1,610
	Above Grade Additive Storage				3,477						70,410				$70,410
	Above Grade On-Site Storage				3,814						77,230				$77,230
	Above Grade Site Work				1,819						36,830				$36,830
	Above Grade PPE Trailer				90						1,810				$1,810
	Equipment				7,807						158,000				$158,000
	Piping Systems				484						9,800				$9,800
	Instrumentation				317						6,420				$6,420
	Electrical				3,416						69,170				$69,170
	Demobilization Cost				1,780						36,400	8,200	2,500	4,900	$52,000
	Total Direct Cost				51,047						$1,034,690	$8,200	$16,300	$5,700	$1,064,890

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Temporary Utilities	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		1000	20.27			1500	3.50	$20,270		$1,500	$3,500	$25,270
D	Remove Temporary Utilitries	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000			$3,240	$8,220			$11,460
	Total				1,780						$36,400	$8,200	$2,500	$4,900	$52,000

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Product Hand'l														
	Concrete Below grade														
mC	SOG	1140	cy	1.08	2358	20.25					$47,750				$47,750
mC	Structural footings	325	cy	1.08	672	20.25					$13,610				$13,610
mC	Wall footings	735	cy	1.08	1520	20.25					$30,780				$30,780
mC	Equipment foundations	230	cy	1.08	476	20.25					$9,640				$9,640
	Product Hand'l														
	Concrete Above grade														
mC	Grout	300	cf	0.04	23	20.25					$470				$470
mC	Walls	1565	cy	1.08	3237	20.25					$65,550				$65,550
mC	Elevated floor	1030	cy	1.08	2130	20.25					$43,130				$43,130
mC	Tilt up walls 14,600sf x 1' thick	14600	cf	0.04	1118	20.25					$22,640				$22,640
mC	Columns for mod. walls	150	cy	1.08	310	20.25					$6,280				$6,280
	Product Hand'l														
	Structural Steel														
mC	Metal roofing 20guage 1.5#/sf	19160	sf	0.008	294	20.25					$5,950				$5,950
mC	Light steel	38	ton	5.00	364	20.25					$7,370				$7,370
mC	Medium steel	52	ton	5.00	498	20.25					$10,080				$10,080
mC	Heavy steel	58	ton	5.00	555	20.25					$11,240				$11,240
mC	Crane rails	5	ton	5.00	48	20.25					$970				$970
mC	Checkered plate 3450 sf 5/16" 12.75#/sf	22	ton	5.00	211	20.25					$4,270				$4,270
mC	Ladders 6#/lf 345 lf	1.00	ton	5.00	10	20.25					$200				$200
mC	Stairs 50#/riser 34 risers	0.85	ton	5.00	8	20.25					$160				$160
mC	Handrail 2runs 2" cs pipe=7.3#/lf 230 lf	0.82	ton	5.00	8	20.25					$160				$160
mC	Davits 0 ea		ton	5.00		20.25									
mC	Crane rail box beam		ton	5.00		20.25									
mC	Pre-engineered struct 9240 sf * 9#	42.0	ton	5.00	402	20.25					$8,140				$8,140
	Product Hand'l														
	Architectural/Buildings/Finishes														
mC	Metal stud w/ gyp. board 3/8"	2410	sf	0.05	212	20.25					$4,290				$4,290
mC	Siding 1/8" metal	40585	sf	0.02	1555	20.25					$31,490				$31,490
mC	Membrane roofing 1/16" sealant	19160	sf	0.02	734	20.25					$14,860				$14,860
mC	Roof insulation 1/2"	19160	sf	0.02	661	20.25					$13,390				$13,390
mC	Fiberboard 1/2"	19160	sf	0.02	661	20.25					$13,390				$13,390
mC	Batten insulation 1/2"	19160	sf	0.02	661	20.25					$13,390				$13,390
mC	Double ext. doors metal	3	ea	0.67	4	20.25					$80				$80
mC	Single ext. drs. mtl.	4	ea	0.50	4	20.25					$80				$80
mC	Roll-up dr. 14'x14' mtl.	2	ea	3.20	12	20.25					$240				$240
mC	Double interior dr mtl.	5	ea	0.67	6	20.25					$120				$120
mC	Single interior dr. mtl	4	ea	0.50	4	20.25					$80				$80

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
mC	HVAC Duct galv. steel. medium	42	ton	5.00	402	20.25					$8,140				$8,140
mC	HVAC dampers	1	ton	5.00	10	20.25					$200				$200
mC	HVAC accessories	1	ton	5.00	10	20.25					$200				$200
mC	HVAC supports	1	ton	5.00	10	20.25					$200				$200
mC	Building sprinklers	2500	lf	0.040	192	20.25					$3,890				$3,890
	Analytical Lab														
	Concrete Below grade														
mC	SOG 26cy * 27	702	cf	0.040	54	20.25					$1,090				$1,090
	Analytical Lab														
	Concrete Above grade														
mC	Walls 28cy *27	756	cf	0.040	58	20.25					$1,170				$1,170
mC	Elevated slab 18cy *27	486	cf	0.040	37	20.25					$750				$750
	Analytical Lab														
	Structural steel														
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf 62 lf	0.11	ton	5.00	1	20.25					$20				$20
	Analytical Lab														
	Architectural/Buildings/Finishes														
mC	Metal stud w/gyp brd 3/8"	4380	sf	0.05	386	20.25					$7,820				$7,820
mC	Skirt trailers 1/8" metal	684	sf	0.02	24	20.25					$490				$490
mC	Stairs and ramps metal	2	ton	5.00	19	20.25					$380				$380
mC	Single ext. dr. mtl.	4	ea	0.40	3	20.25					$60				$60
mC	Single int. dr. mtl.	19	ea	0.40	15	20.25					$300				$300
mC	Building sprinklers	500	lf	0.04	38	20.25					$770				$770
mC	HVAC Duct	1.4	ton	5.00	13	20.25					$260				$260
	Mech/Elect														
	Concrete below grade														
mC	SOG 175cy * 27	4725	cf	0.04	362	20.25					$7,330				$7,330
mC	Structural footings 60cy * 27	1620	cf	0.04	124	20.25					$2,510				$2,510
mC	Equipment foundations30cy * 27	810	cf	0.04	62	20.25					$1,260				$1,260
mC	Grout	30	cf	0.04	2	20.25					$40				$40
	Mech/Elect														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	5610	sf	0.01	86	20.25					$1,740				$1,740
mC	Light steel	8	ton	5.00	77	20.25					$1,560				$1,560
mC	Medium steel	11	ton	5.00	105	20.25					$2,130				$2,130
mC	Heavy steel	13	ton	5.00	124	20.25					$2,510				$2,510
mC	Ladders 28 lf 6#/lf	0.1	ton	5.00	1	20.25					$20				$20

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mech/Elect														
	Architectural														
mC	Siding 1/8"mtl.	11620	sf	0.02	445	20.25					$9,010				$9,010
mC	Roof insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Wall insulation 1/2"	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Membrane roofing 1/16" sealant	5610	sf	0.02	193	20.25					$3,910				$3,910
mC	Fiber board 1/2"	5610	sf	0.018	193	20.25					$3,910				$3,910
mC	Single ext. dr. mtl.	2	ea	0.400	2	20.25					$40				$40
mC	Double ext. dr. mtl.	3	ea	0.67	4	20.25					$80				$80
mC	Roll-up door 14'x14' mtl.	1	ea	3.20	6	20.25					$120				$120
mC	Double int. dr. mtl.	2	ea	0.67	3	20.25					$60				$60
mC	HVAC Duct galv. steel. medium	2.8	ton	5.00	27	20.25					$550				$550
mC	HVAC dampers	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC accessories	0.25	ton	5.00	2	20.25					$40				$40
mC	HVAC supports	0.25	ton	5.00	2	20.25					$40				$40
mC	Building sprinklers	600	lf	0.040	46	20.25					$930				$930
	Warehouse														
	Concrete Below grade														
mC	SOG 330cy * 27	8910	cf	0.04	683	20.25					$13,830				$13,830
mC	Structural footings 20cy * 27	540	cf	0.04	41	20.25					$830				$830
	Warehouse														
	Structural steel														
mC	Pre-engineered struct. 9600sf 9#/sf	43	ton	5.00	414	20.25					$8,380				$8,380
	Warehouse														
	Architectural														
mC	Metal stud w/ gyp bd.	100	sf	0.05	10	20.25					$200				$200
mC	Single ext. dr. mtl.	6	ea	0.40	5	20.25					$100				$100
mC	Double exterior door metal	1	ea	0.67	1	20.25					$20				$20
mC	Roll-up door metal 14'x14'	3	ea	3.20	18	20.25					$360				$360
mC	Single interior door metal	1	ea	0.40	1	20.25					$20				$20
mC	Building sprinklers	750	lf	0.040	57	20.25					$1,150				$1,150
	Control Room														
	Architectural														
mC	Metal stud w/ gyp bd.	560	sf	0.05	54	20.25					$1,090				$1,090
mC	Skirting 1/8" metal	348	sf	0.02	13	20.25					$260				$260
mC	Metal ramp & stairs	0.5	ton	5.00	5	20.25					$100				$100
mC	Single interior door metal	4	ea	0.40	3	20.25					$60				$60
mC	HVAC duct, supports, dampers & acces.	0.50	ton	5.00	5	20.25					$100				$100

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CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Additive Storage														
	Concrete Below grade														
mC	SOG 110cy * 27	2970	cf	0.04	228	20.25					$4,620				$4,620
mC	Structural footings 30cy * 27	810	cf	0.04	62	20.25					$1,260				$1,260
mC	Equipment foundation 20cy * 27	540	cf	0.04	41	20.25					$830				$830
	Additive Storage														
	Structural steel														
mC	Metal roofing 20guage 1.5#/sf	2515	sf	0.01	39	20.25					$790				$790
mC	Light steel	17	ton	5.00	163	20.25					$3,300				$3,300
mC	Medium steel	23	ton	5.00	220	20.25					$4,460				$4,460
mC	Heavy steel	26	ton	5.00	249	20.25					$5,040				$5,040
mC	Checkered plate 4576 sf 5/16" 12.75#/sf	30	ton	5.00	287	20.25					$5,810				$5,810
mC	Stairs 50#/riser 110 risers	3	ton	5.00	26	20.25					$530				$530
mC	Bin loading lines =<2 1/2"	325	lf	0.05	33	20.25					$670				$670
	Additive Storage														
	Architectural														
mC	Siding 1/8"mtl.	39550	sf	0.02	1515	20.25					$30,680				$30,680
mC	Roof insulation 1/2"	2515	sf	0.02	87	20.25					$1,760				$1,760
mC	Wall insulation 1/2"	19775	sf	0.02	682	20.25					$13,810				$13,810
mC	Membrane roofing 1/16" sealant	2515	sf	0.02	87	20.25					$1,760				$1,760
mC	Fiber board 1/2"	2515	sf	0.018	87	20.25					$1,760				$1,760
mC	Single ext. dr. mtl.	1	ea	0.40	1	20.25					$20				$20
mC	Double ext. dr. mtl.	1	ea	0.67	1	20.25					$20				$20
	On-Site Storage														
	Concrete Below grade														
mC	SOG 895 cy * 27	24165	cf	0.04	1851	20.25					$37,480				$37,480
mC	Structural footing 200 cy * 27	5400	cf	0.04	414	20.25					$8,380				$8,380
mC	Continuos footing 310 cy * 27	8370	cf	0.04	641	20.25					$12,980				$12,980
	On-Site Storage														
	Concrete Above grade														
mC	Tilt-up walls 22780 sf * 1ft thick	22780	cf	0.04	1745	20.25					$35,340				$35,340
mC	Columns for mod. wall 285 cy * 27	7695	cf	0.04	589	20.25					$11,930				$11,930
	On-Site Storage														
	Structural steel														
mC	Light steel	111	ton	5.00	1063	20.25					$21,530				$21,530
mC	Medium steel	2	ton	5.00	19	20.25					$380				$380
mC	Heavy steel	7	ton	5.00	67	20.25					$1,360				$1,360
mC	Crane rail box beam stl.	14	ton	5.00	134	20.25					$2,710				$2,710
mC	Supports for box beam	1	ton	5.00	10	20.25					$200				$200
mC	Crane rail stops	1	ton	5.00	10	20.25					$200				$200

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	On-Site Storage														
	Architectural														
mC	Single ext. dr. mtl.	8	ea	0.40	6	20.25					$120				$120
mC	Roll-up door metal 14'x14'	3	ea	3.20	18	20.25					$360				$360
mC	Building sprinklers	2000	lf	0.040	153	20.25					$3,100				$3,100
	Site Work														
	Pipe rack / Below grade concrete														
mC	Structural footings 35cy *27	945	cf	0.040	72	20.25					$1,460				$1,460
	Site Work														
	Pipe rack / Structural steel														
mC	Light steel	4	ton	5.00	38	20.25					$770				$770
mC	Medium steel	5	ton	5.00	48	20.25					$970				$970
mC	Heavy steel	6	ton	5.00	57	20.25					$1,150				$1,150
	Site Work														
	Contam'd water/Below grade concrete														
mC	SOG 60cy *27	1620	cf	0.04	124	20.25					$2,510				$2,510
	Site Work														
	Contam'd water/Above grade concrete														
mC	Walls 150 cy * 27	4050	cf	0.04	310	20.25					$6,280				$6,280
mC	Concrete blocks	270	cf	0.04	21	20.25					$430				$430
mC	Angle iron 2-1/2"x2-1/2"x1/4" 3.62#/lf 112lf	0.2	ton	5.00	2	20.25					$40				$40
mC	Double contained pipe HDPE	2100	lf	0.20	804	20.25					$16,280				$16,280
	Site Work														
	Storm water														
mC	Catch Basins	108	cf	0.04	8	20.25					$160				$160
	Site Work														
	HVAC Stack Below grade														
mC	Structural footings 3cy *27	81	cf	0.04	6	20.25					$120				$120
mC	Stack Base 2cy	54	cf	0.04	4	20.25					$80				$80
mC	Duct footings 3cy	81	cf	0.04	6	20.25					$120				$120
mC	Guy anchors 4cy	108	cf	0.04	8	20.25					$160				$160

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DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Site Work														
	Off-Gas & HVAC Stack Above grade														
mC	Stack structure	2	ton	5	19	20.25					$380				$380
mC	Ladder 55 lf 6#/lf	0.165	ton	5	2	20.25					$40				$40
mC	Grating 43 sf 10#/sf	0.215	ton	5	2	20.25					$40				$40
mC	Platform steel	0.22	ton	5	2	20.25					$40				$40
mC	Davit 1ea	0.25	ton	5	2	20.25					$40				$40
mC	Kickplate	24	lf	0.016	1	20.25					$20				$20
mC	Duct to Stack 100 lf	100	lf	0.143	27	20.25					$550				$550
mC	Duct support 2 ea	0.25	ton	5	2	20.25					$40				$40
mC	Handrail 24 lf 2runs 2"cs pipe 7.3#/lf	0.1	ton	5	1	20.25					$20				$20
	Site Work														
	Poten. Contam. Water														
C	Drain lines	1500	lf	0.16	481	20.25					$9,740				$9,740
	PPE Trailer														
	Architectural														
mC	Metal stud w/ gyp bd.	605	sf	0.05	58	20.25					$1,170				$1,170
mC	Single ext. dr. mtl.	2	ea	0.40	2	20.25					$40				$40
mC	Single interior door metal	4	ea	0.40	3	20.25					$60				$60
mC	Skirting 1/8" metal	324	sf	0.02	12	20.25					$240				$240
mC	Building sprinklers	200	lf	0.040	15	20.25					$300				$300
	Interconnecting Facility														
	Concrete Below Grade														
mC	SOG	60	cy	1.08	124	20.25					$2,510				$2,510
mC	Structural footing	10	cy	1.08	21	20.25					$430				$430
mC	Equipment foundations	10	cy	1.08	21	20.25					$430				$430

23 2000

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	15-ag-001waste rec. tnk. agitator	0.2	tn	20	8	20.25					$160				$160
C	15-ag-003,04,05 Slurry batch tank agitator	0.6	tn	20	24	20.25					$490				$490
C	15-ag-008 Supernatant tank agitator	0.2	tn	20	8	20.25					$160				$160
C	15-pm-001 Rec. tank trans pump A & B	0.2	tn	20	8	20.25					$160				$160
C	15-pm-002 thickener trans pump A & B	0.2	tn	20	8	20.25					$160				$160
C	15-pm-003 Slurry batch trans pump A & B	0.5	tn	20	20	20.25					$410				$410
C	15-pm-004,05 Slurry batch trans pump A & B	1	tn	20	40	20.25					$810				$810
C	15-pm-008 Supt.sump tnk agitator A & B	2.5	tn	20	100	20.25					$2,030				$2,030
C	15-tk-001 Receipt tank	6	tn	20	241	20.25					$4,880				$4,880
C	15-tk-002 Setting tank	2.75	tn	20	110	20.25					$2,230				$2,230
C	15-tk-003,04,05 Sluury batch tank	9	tn	20	361	20.25					$7,310				$7,310
C	15-tk-006 Filt. cake weight & hopper	0.4	tn	20	16	20.25					$320				$320
C	15-tk-008 Supernt. sump tank	1	tn	20	40	20.25					$810				$810
C	15-fl-001 Auto. filter press	25	tn	20	1002	20.25					$20,290				$20,290
C	17-mx-001 Batch mixer	5	tn	20	200	20.25					$4,050				$4,050
C	19-bl-001& 002 PW blower	0.4	tn	20	16	20.25					$320				$320
C	25-cy-001..021 Roller conveyors	20	tn	20	802	20.25					$16,240				$16,240
C	25-cy-003 Fill station conveyor	1	tn	20	40	20.25					$810				$810
C	25-hd-001 Container handlg forklift	1	tn	20	40	20.25					$810				$810
C	26-bn-001 Recycle weight hopper	0.8	tn	20	32	20.25					$650				$650
C	26-bn-002 Rework batch bin	1.3	tn	20	52	20.25					$1,050				$1,050
C	26-cn-001 Rework bridge crane	12	tn	20	481	20.25					$9,740				$9,740
C	26-cy-001..005 Rework conveyors	5	tn	20	200	20.25					$4,050				$4,050
C	26-cy-006 Rubble conveyor	1	tn	20	40	20.25					$810				$810
C	26-fl-001 Rework fac. vacuum	1	tn	20	40	20.25					$810				$810
C	26-gb-001 Rework glove box	0.4	tn	20	16	20.25					$320				$320
C	26-me-001 Rework head station	0.2	tn	20	8	20.25					$160				$160
C	26-me-004 Remote contrl jack hammer	0.5	tn	20	20	20.25					$410				$410
C	26-me-007 Rubble jaw recycle crusher	0.4	tn	20	16	20.25					$320				$320
C	30-xt-001 Main transformer	0.4	tn	20	16	20.25					$320				$320
C	31-mc-001 MCC	0.2	tn	20	8	20.25					$160				$160
C	31-mc-002 MCC	0.2	tn	20	8	20.25					$160				$160
C	31-sg-001 Volt switchgear	0.75	tn	20	30	20.25					$610				$610
C	33-up-001 UPS	0.5	tn	20	20	20.25					$410				$410
C	40-cm-001 Air comp. package	0.5	tn	20	20	20.25					$410				$410
C	40-dr-001 Air comp. dryer	0.2	tn	20	8	20.25					$160				$160
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		4,099	20.25					$83,000				$83,000

000733

8113

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	40-ve-001 Air rec. tank	0.8	tn	20	32	20.25					$650				$650
C	40-cm-002 Inst. air comp.	0.3	tn	20	12	20.25					$240				$240
C	40-dr-002 Instr. air comp. dryer	0.2	tn	20	8	20.25					$160				$160
C	40-ve-002 Instr. air receiving tank	0.3	tn	20	12	20.25					$240				$240
C	41-cm-001 Breathing air sys. A & B	4	tn	20	160	20.25					$3,240				$3,240
C	43-ag-001 Flocculant addit. tnk agitator	0.2	tn	20	8	20.25					$160				$160
C	43-bn-001 Lime addit. bag dump station	0.3	tn	20	12	20.25					$240				$240
C	43-bn-002 Lime addit. filter receiver	0.4	tn	20	16	20.25					$320				$320
C	43-pm-002 Lime addit. trans. pump	0.4	tn	20	16	20.25					$320				$320
C	43-tk-002 Lime addit. slurry tank	0.2	tn	20	8	20.25					$160				$160
C	44-bn-001,004 Cement storage bin	8	tn	20	321	20.25					$6,500				$6,500
C	44-bn-002,003 additive storage bin	11.2	tn	20	449	20.25					$9,090				$9,090
C	44-bl-001..04 Add. exh. blower	2	tn	20	80	20.25					$1,620				$1,620
C	44-bn-005 Additive weight bin delivery	0.5	tn	20	20	20.25					$410				$410
C	44-bn-006 Cement mix del. hopper	1	tn	20	40	20.25					$810				$810
C	44-bn-007 Absorb storage bin	1	tn	20	40	20.25					$810				$810
C	44-cy-001,02,03,04 Air slides	0.4	tn	20	16	20.25					$320				$320
C	44-fl-001..006 Addit. bin baghouse filter	0.6	tn	20	24	20.25					$490				$490
C	44-rv-001..004 Bin rotary valves	0.4	tn	20	16	20.25					$320				$320
C	44-pm-001 Cement/additive trans. pump	0.1	tn	20	4	20.25					$80				$80
C	44-pm-002 Absorbent trans. pump	0.1	tn	20	4	20.25					$80				$80
C	44-vb-001 Cement bin vibrator A & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-002 additive bin vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-003 additive bin vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-004 additive bin vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-005 additive hopper vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	44-vb-006 addit. del. hopper vibratorA & B	0.2	tn	20	8	20.25					$160				$160
C	50-pm-001 Process water pump A & B	0.2	tn	20	8	20.25					$160				$160
C	50-tk-001 Process water tank	0.5	tn	20	20	20.25					$410				$410
C	56-pm-001 Recyl. water line pump	0.3	tn	20	12	20.25					$240				$240
C	63-tk-001, 002 Lab waste tank	0.4	tn	20	16	20.25					$320				$320
C	73-ah-001,03 Cont. process air handlg.	1	tn	20	40	20.25					$810				$810
C	73-ah-002 Cont. process air handlg.	1	tn	20	40	20.25					$810				$810
C	73-ah-005 Stabiliz. fac. air handlg. unit	0.4	tn	20	16	20.25					$320				$320
C	73-ah-004 Rework air handlg. unit	0.5	tn	20	20	20.25					$410				$410
C	73-fa-001 Cont. process area exh fan A & B	0.4	tn	20	16	20.25					$320				$320
C	73-fa-005 Stabiliz. fac. exh. fan	0.2	tn	20	8	20.25					$160				$160
	Take-off Allowance														
	Subtotal Direct Cost	1.51	LOT		1,542	20.23					$31,200				$31,200

000234

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Equipment														
	Equip. No. Description														
C	73-fl-001,02,03 Cont. prs air filt. housing	0.2	tn	20	8	20.25					$160				$160
C	73-fl-004 Rework filter housing	0.4	tn	20	16	20.25					$320				$320
C	73-fl-005 Stabiliz. fac. filt. housing	0.4	tn	20	16	20.25					$320				$320
C	73-he-001 Unit heater A..F	0.6	tn	20	24	20.25					$490				$490
C	73-me-001 Press. contrl. damp A..C	0.3	tn	20	12	20.25					$240				$240
C	76-ah-001 Warehouse air handlg. A & B	0.2	tn	20	8	20.25					$160				$160
C	76-ah-002 Maint. room air handler	0.4	tn	20	16	20.25					$320				$320
C	76-fa-001 Warh./curing exh. fan A & B	0.2	tn	20	8	20.25					$160				$160
C	76-fa-002 Maint. rm exh. fan	0.1	tn	20	4	20.25					$80				$80
C	76-fa-003 Elect. rm. exh. fan	0.1	tn	20	4	20.25					$80				$80
C	76-fa-004 Pipeway exh. fan	0.1	tn	20	4	20.25					$80				$80
C	76-fl-001 Warh. filt. housing A & B	0.1	tn	20	4	20.25					$80				$80
C	76-me-001 Wall louver	0.1	tn	20	4	20.25					$80				$80
C	76-fl-002 Maint. rm. filt. housing	0.2	tn	20	8	20.25					$160				$160
C	80-cn-002 Maint. monorail A..E	5	tn	20	200	20.25					$4,050				$4,050
C	80-cn-003 Maint. shop crane	5	tn	20	200	20.25					$4,050				$4,050
C	80-se-001 Machine shop equip.	5	tn	20	200	20.25					$4,050				$4,050
C	80-se-002 Weld shop equip.	1	tn	20	40	20.25					$810				$810
C	80-se-003 Elect. shop equip.	1	tn	20	40	20.25					$810				$810
C	80-se-004 Pipe fab. shop equip.	1	tn	20	40	20.25					$810				$810
C	80-se-005 Instr. shop equip.	1	tn	20	40	20.25					$810				$810
C	81-cn-001,002 Bridge crane	5	tn	20	200	20.25					$4,050				$4,050
C	82-cn-001 Bridge crane and robot arm	2	tn	20	80	20.25					$1,620				$1,620
C	82-cn-002 Monorail hoist	8	tn	20	321	20.25					$6,500				$6,500
C	82-cn-003 Bridge crane	8	tn	20	321	20.25					$6,500				$6,500
C	82-me-001,02,03 Fill stations	3	tn	20	120	20.25					$2,430				$2,430
C	82-me-004 Shield wall port A..E	0.5	tn	20	20	20.25					$410				$410
C	83-sd-001,002,009..012,020..025 Shield doors	1.2	tn	20	48	20.25					$970				$970
C	83-sd-003..008,013..019 Air lock door	1.2	tn	20	48	20.25					$970				$970
C	83-sw-001 Shield window A..H	0.8	tn	20	32	20.25					$650				$650
C	84-me-001 Mix sample station	1	tn	20	40	20.25					$810				$810
C	85-nd-001 Radio inspec. station	0.1	tn	20	4	20.25					$80				$80
C	85-tv-001 CCTV inspec. station	0.1	tn	20	4	20.25					$80				$80
C	90-sw-001 Control software, train.	0.1	tn	20	4	20.25					$80				$80
C	93-sa-001..005 Emerg. eyewash/ shower	0.5	tn	20	20	20.25					$410				$410
C	44-bn-008 Absorb day bin	0.2	tn	20	8	20.25					$160				$160
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		2,166	20.22					43,800				$43,800

000235

8113

CONTRACTOR - Stated in FY99 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Piping Systems														
15	PIPNIG SYSTEMS														
C	Remove 1/2" c.s. gate valve	11	EA	Included											
C	Remove 3/4" c.s. gate valve	10	EA	Included											
C	Remove 2" c.s. gate valve	10	EA	Included											
C	Remove 1/2" s.s. gate valve	31	EA	Included											
C	Remove 3/4" s.s. gate valve	2	EA	Included											
C	Remove 2" s.s. gate valve	2	EA	Included											
C	Remove 1-1/2" s.s. check valve	6	EA	Included											
C	Remove 3" s.s. check valve	4	EA	Included											
40															
C	Remove 1/2" c.s. gate valve	2	EA	Included											
C	Remove 3/4" c.s. gate valve	4	EA	Included											
43															
C	Remove 1/2" s.s. gate valve	8	EA	Included											
C	Remove 3/4" s.s. gate valve	4	EA	Included											
C	Remove 2" s.s. gate valve	4	EA	Included											
C	Remove 3" s.s. check valve	4	EA	Included											
50															
C	Remove 1/2" c.s. gate valve	7	EA	Included											
C	Remove 3/4" c.s. gate valve	2	EA	Included											
C	Remove 2" c.s. gate valve	2	EA	Included											
53															
C	Remove 1/2" c.s. gate valve	3	EA	Included											
C	Remove pipe 4" & <	4500	LF	0.053	478	20.25					$9,680				$9,680
C	Piping material bulk	282	CF	0.01	6	20.25					$120				$120
	Pipe:$100K/($140.46*.60)*(308.2cf)=355.7cf/$100K														
	$79,160/$100,00=.7916*355.7=281.6cf														
	6 inch diameter pipe														
	1 feet long														
	0.2 cubic feet														
	1 LF = .053 man-hours / LF = .2 CF														
	.053 MH/LF * .2 CF = .0106 MN/CF = 1 LF														
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT		484	20.25					9,800				$9,800

000736

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
15	**Instrumentation**														
C	Remove level transmitter	18	EA	Included											
C	Remove process level transmitter	18	EA	Included											
C	Remove pressure indicator	6	EA	Included											
18															
C	Remove element/ transmitter	2	EA	Included											
C	Remove differential press. transmitter	4	EA	Included											
C	Remove instr. piping for transmitter	4	EA	Included											
44															
C	Remove 8" pinch valves	6	EA	Included											
90															
C	Remove process station control	1	EA	Included											
C	Remove DCS	1	EA	Included											
C	Remove motor operated valves	4	EA	Included											
92															
C	Remove fire alarm and evacuation system	1	LOT	Included											
93															
C	Remove real time SOx monitor	1	EA	Included											
C	Remove hps control station	1	EA	Included											
C	Remove auto radio counter	2	EA	Included											
C	Remove passive radon monitor	9	EA	Included											
C	Remove radonn wkg. level monitor	6	EA	Included											
C	Remove body frisker	3	EA	Included											
C	Remove air sampling station (CAM)	11	EA	Included											
C	Remove tool comtamination monitor	2	EA	Included											
C	Remove 8" butterfly valves	30	EA	Included											
C	Remove pneumatic actuated valves	76	EA	Included											
C	Remove piping for pneumatic valves	76	EA	Included											
C	Remove conduit	2000	LF	0.033	132	20.25					$2,670				$2,670
C	Remove cable tray	600	LF	0.021	25	20.25					$510				$510
C	Pipe tubing	1000	LF	0.04	80	20.25					$1,620				$1,620
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT												

8113

000237

DETAIL ESTIMATE WORKSHEETS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
18	**Instrumentation**														
C	Remove temperature indicator/ transmitter	6	EA	Included											
C	Remove instr. piping for valves	18	EA	Included											
C	Remove process pipe for level trans.	5	EA	Included											
C	Remove instr. pipe for flow transmitter	3	EA	Included											
C	Remove indicator	6	EA	Included											
C	Remove temperature indicator	2	EA	Included											
C	Remove flow indicator	5	EA	Included											
73															
C	Remove HVAC controls	1	LOT	20	40	20.25					$810				$810
78															
C	Remove HVAC controls	1	LOT	20	40	20.25					$810				$810
	Electrical														
	Electrical														
mC	480v pr. &mtr. feeders 19ea*500#	4.75	tn	20	182	20.25					$3,690				$3,690
mC	Conduit & wiring 4" & <	94290	lf	0.016	2889	20.25					$58,500				$58,500
mC	480v distribution MCC 1000# * 5ea	2.5	tn	20	96	20.25					$1,940				$1,940
mC	Transformer 3750kv 1ea * 2000#	1	tn	20	38	20.25					$770				$770
mC	Utility metering cabinet 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Generator 700kw 1ea * 1ton	1	tn	20	38	20.25					$770				$770
mC	Transfer switch 1ea * 500#	0.25	tn	20	10	20.25					$200				$200
mC	Stl. pole <18"dia 40'long 20ea.	4	tn	20	153	20.25					$3,100				$3,100
	Take-off Allowance														
	Subtotal Direct Cost	1	LOT												

Estimate No.: C4981203R2
Project: D&D Chemical Stabilization
Client: DOE
WBS: 2.1.3.G.P

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Date: 20-Aug-99
Estimator: Wagner
Location: FERNALD
TASK NO.: 4S11B

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
$4,892,510	Mobilizaton Cost labor		Mobilizaton Cost matl		Mobilizaton Cost equip		Below Grade labor		Below Grade ppe		Above Grade labor	
Cost Drivers	Base $	$58,690	Base $	$124,590	Base $	$147,830	Base $	$682,070	Base $	$0	Base $	$2,626,710
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor							-5%	15%			-5%	20%
Material Pricing			-5%	15%								
Equipment Rental					-5%	15%						
Subcontract $'s												
Quantity Variation			-5%	10%	-5%	10%						
Contamination							-5%	15%	-5%	15%		
Environmental												
Schedule												
Project Definition	-10%	25%					-5%	10%	-5%	10%	-5%	10%
Range - %	-10%	25%	-10%	25%	-10%	25%	-15%	40%	-10%	25%	-10%	30%
Range - $	$52,821	$73,363	$112,131	$155,738	$133,047	$184,788	$579,760	$954,898	$0	$0	$2,364,039	$3,414,723
Distribution	U		U		U		U		U		U	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Demobilization Cost labor		Demobilization Cost s/c		Demobilization Cost matl		Demobilization Cost equip					
Cost Drivers	Base $	$122,790	Base $	$201,810	Base $	$22,570	Base $	$905,450	Base $	$0	Base $	$0
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity/labor	-5%	20%			-5%	15%						
Material Pricing												
Equipment Rental							-5%	15%				
Subcontract $'s			-5%	15%								
Quantity Variation												
Contamination												
Environmental												
Schedule	-5%	10%										
Project Definition			-5%	10%	-5%	10%	-5%	10%				
Range - %	-10%	30%	-10%	25%	-10%	25%	-10%	25%	0%	0%	0%	0%
Range - $	$110,511	$159,627	$181,629	$252,263	$20,313	$28,213	$814,905	$1,131,813	$0	$0	$0	$0
Distribution	U		U		U		U					
Correlation Rank												

Analyst: _____

Client: _____

000239

81113

08/20/99

CONTRACTOR - Stated in FY99 DOLLARS

AP. .DIX "A"

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

SITE SPECIFIC

EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

	PERCENT OF INFLUENCE ON CHART MANHOURS											
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			80.0%	20.0%	0.16
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
WORK WEEK	<--- MULTIPLE SHIFTS-											
50 HOUR WORK WEEK	//////	//////	//////	OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS	4-10s / 5-8s			100.0%	15.0%	0.15
60 HOUR WORK WEEK	//// MULTIPLE-SHIFT ////		OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS					0.0%	0.0%	0
SHIFTWORK										0.0%	0.0%	0
2ND SHIFT					2ND SHIFT		OR ONE SHIFT ONLY			100.0%	3.0%	0.03
3RD SHIFT			3RD SHIFT							100.0%	5.0%	0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
											100.0%	89.4%

NOTES.....
1. TURNOVER HAS BEEN CONSIDERED
2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 89.4%

MULTIPLIER (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.12

CONTRACTOR: Stabilite EX22 POLLARD

APPENDIX "B"

EFFICIENCY FACTORS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	12%	12.0
S/T = BASE UNIT MANHOURS		112
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		112
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		112

• PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	23.00%	26	71.00%	80	79.00%	88	147.00%	165	326.00%	365
AS A MULTIPLIER)/TOTAL HRS	1.23	137.8	1.71	191.5	1.79	200.5	2.47	276.6	4.26	477.1
TOTAL MULTIPLIER w/SITE PROD.	1.3776		1.9152		2.0048		2.7664		4.7712	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

	14.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	48.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.81	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.23	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg.
Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DA 4 - 10's		600	600	600	600	600
ADDITN'L SITE SAFETY MEETINGS NOT INCLD. IN BASE	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING	QUANTITY	0	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS	QUANTITY	2	2	2	2	3
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		30	30	30	30	45
MOBILIZATION - ROUND TRIPS	QUANTITY	4	4	4	4	4
(ADJUST LEVEL D per WORK PLAN)	MINUTES	15	15	15	15	15
TOTAL		60	60	60	60	60
COOLDOWNS PER DAY	QUANTITY	N/A	4	4	8	8
** (4 OUT OF 12 MONTHS) 33.33%	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		485	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.81	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

PPE"s - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY	Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)			
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CA		$'s	*	MAN DAYS	MAT'L.$'s	PPE LEVEL	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1034	$13,835	C / C+/ B	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISP	EA	4.46	3	1034	$13,835	C / C+/ B	(DOUBLE PPE)
GLOVE LINER - DISPOSABLE	PR	0.24	3	1034	$744	C / C+/ B	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	1034	$807	C / C+/ B	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	1034	$3,164	C / C+/ B	
APR CARTRIDGES - DISPOSABLE	PR	11.74	3	1034	$36,417	C / C+/ B	
SUB-TOTAL		22.18	3		$68,802		
				$/MD =	$66.54		

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		$'s		MAN DAYS	MAT'L.$'s	PPE LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & B	PR	4.46	3	3936	$52,664	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	3936	$2,834	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	3936	$3,070	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	3936	$12,044	mC
SUB-TOTAL		5.98	3		$70,612	
				$/MD =	$17.94	

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	$0	C
SCBA	EA	1894.00	2	0	$0	B
COOL VESTS	EA	137.50	6	0	$0	C/B
THERMO STRIPS	EA	50.00	6	0	$0	C/B
SUB-TOTAL					$0	

MAT'L.$'s
$139,400

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDE AS PART OF PROJECT COSTS AT THIS TIME.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

FLUOR DANIEL FERNALD

DATE: 20-A
ESTIMATOR: Wag
LOCATION: FERNALD
TASK NO.: 4S11B

--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC. PHYSICAL (3hrs), IN-VIVO (1hr)	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BASELINE PHYSICALS	1	4	52	208	$20.27	$4,220
ANNUAL PHYSICALS	0	4	52	0	$20.27	$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	52	52	$20.27	$1,050
SUB-TOTAL						$5,270

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR $
BI-MONTHLY BIOASSAY	6	1	52	289	$20.27	$5,860
SUB-TOTAL						$5,860

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR $'s
	47	2	94	$20.27	$1,900

NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.004274	52	0.2222	210

		LABOR $'s THRU SAFETY	LABOR $'s
WORK DELAYS CAUSED BY MONITORING	1.0%	$1,586,390	$15,900
			LABOR $'s
WORK DELAYS CAUSED BY RAD CHECKING	1.0%	$1,586,390	$15,900

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	$44,800	$139,400	$184,200

..:\ESTIMATE\SILOS\CEMENT_1\CMENT1R2.WK4

APPENDIX "D"

ACTIVITY DURATIONS

FLUOR DANIEL FERNALD

PROJECT: D&D Chemical Stabilization
ESTIMATE NO.: C4981203R2
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: Wagner
LOCATION: FERNALD
TASK NO.: 4S11B

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	29-Dec-98	01-Jan-2009	19-Jun-2009	05-Dec-2009	11.12	MONTHS
					0	MONTHS
TOTAL					11.1	MONTHS

	DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	125.8	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS					0	MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

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000745

RISK ANALYSIS INPUT DATA TABLE

D&D Chemical Stabilization

Estimate No.:C4981203R2

Item No.	Cost Element Description	Estimated Base $	Distribution Range Width Low %	Low $	High %	High $	Dist. Type	Corr. Rank
01	mob labor	$58,450	-10%	$52,605	25%	$73,063	U	-
02	mob matl	$124,060	-10%	$111,654	25%	$155,075	U	-
03	mob equip	$147,200	-10%	$132,480	25%	$184,000	U	-
04	below grade labor	$679,180	-15%	$577,303	40%	$950,852	U	-
05	below grade ppe	$282,980	-10%	$254,682	25%	$353,725	U	-
06	above grade labor	$2,615,260	-10%	$2,353,734	30%	$3,399,838	U	-
07	demob labor	$122,270	-10%	$110,043	30%	$158,951	U	-
08	demob s/c	$10,830	-10%	$9,747	25%	$13,538	U	-
09	demob matl	$22,470	-10%	$20,223	25%	$28,088	U	-
10	demob equip	$901,600	-10%	$811,440	25%	$1,127,000	U	-
11				$0		$0		
12				$0		$0		
13				$0		$0		
14				$0		$0		
15				$0		$0		
16				$0		$0		
17				$0		$0		
18				$0		$0		
19				$0		$0		
20				$0		$0		
21				$0		$0		
22				$0		$0		
23				$0		$0		
24				$0		$0		
25				$0		$0		
26				$0		$0		
27				$0		$0		
28				$0		$0		
29				$0		$0		
30				$0		$0		
31				$0		$0		
32				$0		$0		
33				$0		$0		
34				$0		$0		
35				$0		$0		
36				$0		$0		
37				$0		$0		
38				$0		$0		
39				$0		$0		
40				$0		$0		
41				$0		$0		
42				$0		$0		
43				$0		$0		
44				$0		$0		
45				$0		$0		
Total	D&D Chemical Stabilization	$4,964,300		$4,433,911		$6,444,129		

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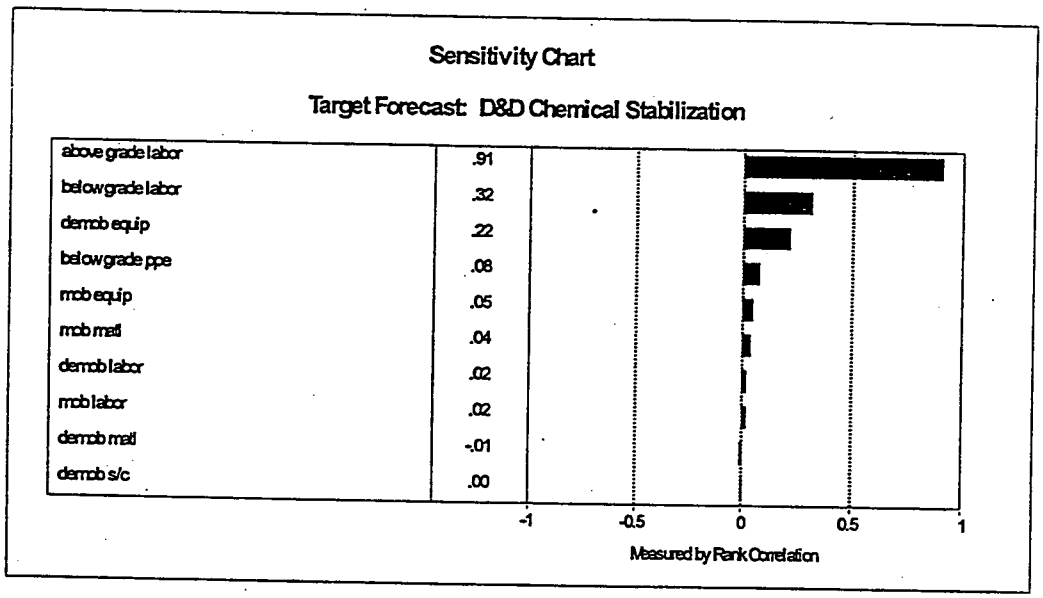
8113

Crystal Ball Report



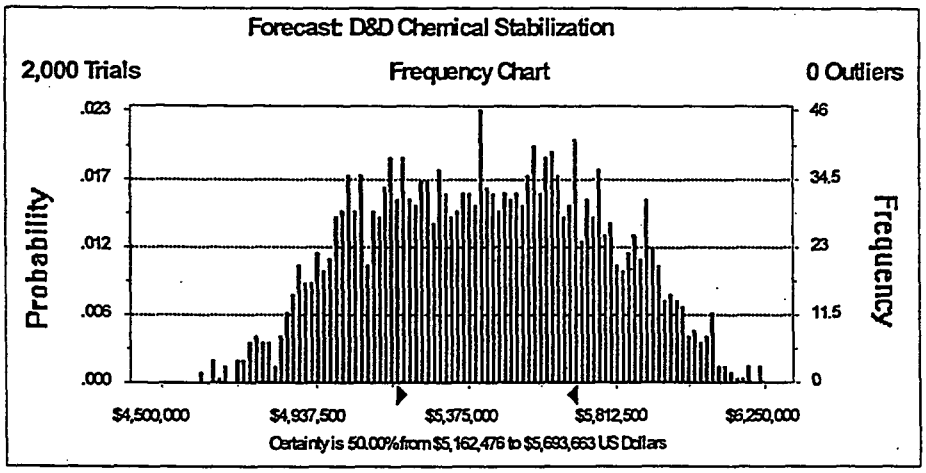
000747

Forecast: D&D Chemical Stabilization **Cell: C52**

Summary:

Certainty Level is 50.00%
Certainty Range is from $5,162,476 to $5,693,663 US Dollars
Display Range is from $4,500,000 to $6,250,000 US Dollars
Entire Range is from $4,609,056 to $6,247,271 US Dollars
After 2,000 Trials, the Std. Error of the Mean is $7,540

Statistics:	Value
Trials	2000
Mean	$5,431,554
Median	$5,431,970
Mode	—
Standard Deviation	$337,193
Variance	1E+11
Skewness	0.01
Kurtosis	2.17
Coeff. of Variability	0.06
Range Minimum	$4,609,056
Range Maximum	$6,247,271
Range Width	$1,638,214
Mean Std. Error	$7,539.86



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Forecast: D&D Chemical Stabilization (cont'd) **Cell: C52**

Percentiles:

Percentile			US Dollars
0.0%			$4,609,056
2.5%			$4,828,746
5.0%			$4,897,566
50.0%	Risk Budget	9.4%	$5,431,970
95.0%	Contingency	10.9%	$5,970,339
97.5%			$6,045,406
100.0%			$6,247,271

End of Forecast

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ESTIMATE SUMMARY SHEET

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

8113

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
ITEM NO.7	Premobilization/Mobilization	820		$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System	1,140		$23,100				$23,100
II	RCS Phase I, II, & III	1,743		$35,300				$35,300
III	Silo Waste Retrieval System	2,204		$44,600				$44,600
IV	Transfer Tank Area	4,520		$91,500				$91,500
	Demobilization Cost	1,400		$28,800	$8,200	$2,500	$3,500	$43,000
DIRECT FIELD COSTS TOTAL		11,827	$20.35	$240,700	$8,200	$16,300	$4,300	$269,500
SUPERVISION - CONTRACTOR - STAFF		8,960		$209,800				$209,800
SMALL TOOLS & CONSUMABLES @ 3%						$7,200		$7,200
MISC. EQUIP. RENTAL (See Equipment Schedule)							$278,400	$278,400
PERDIEM / SUBSISTANCE					$76,800			$76,800
TEMPORARY FACILITIES & UTILITIES		532		$10,800		$10,800		$21,600
JOB CLEAN-UP 6%		532		$10,800		$3,600		$14,400
SAFETY 3%		231		$4,700		$2,500		$7,200
HEALTH PHYSICS S/C		1,145		$23,300		$11,000		$34,300
ERCLA - 40 HRs/FTE		760		$15,500				$15,500
ET/SITE ACCESS & JOB SPECIFIC TRAINING		380		$7,700				$7,700
PAYROLL BURDENS & BENEFITS		-	-	$298,300				$298,300
OVERHEAD & PROFIT		-	-		$248,100			$248,100
BOND		-	-		$14,900			$14,900
SALES TAX		-	-			$3,100	$17,000	$20,100
INDIRECT FIELD COSTS TOTAL		12,540		$580,900	$339,800	$38,200	$295,400	$1,254,300
DIRECT & INDIRECT FIELD COSTS TOTAL		24,367	$33.72	$821,600	$348,000	$54,500	$299,700	$1,523,800
WASTE DISPOSITION - MGMT. - FD FERNALD				$1,431,356	$2,396,284	$3,503,822	$56,950	$7,388,411
WASTE MANAGEMENT COSTS TOTAL				$1,431,400	$2,396,300	$3,503,800	$56,900	$7,388,400
PROJECT MANAGEMENT - FLUOR DANIEL FERNALD				$963,200	$117,300	$26,600		$1,107,100
FIELD PREPARATION								
PROJECT CLOSE OUT				$94,200	$3,100			$97,300
FD-FERNALD FIELD SUPPORT COSTS TOTAL				$1,057,400	$120,400	$26,600		$1,204,400
ENGINEERING, PLANNING, PROCUREMENT - FLUOR DANIEL FERNALD				$123,800	$9,500	$6,700		$140,000
ENGINEERING, PLANNING & PROCUREMENT COSTS TOTAL				$123,800	$9,500	$6,700		$140,000
SALES TAX - FLUOR DANIEL FERNALD						$212,200		$212,200
SUB-TOTAL (BASE ESTIMATE)								$10,468,800
RISK BUDGET 7.0%								$106,700
TARGET ESTIMATE ITEM NO.7				(FY 99 DOLLARS)				$10,575,500
NTS BURIAL FEE ITEM NO.30								$6,662,514

ESTIMATE PERFORMED BY ESTIMATING SERVICES

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST / UNIT Labor	COST / UNIT S/C	COST / UNIT Mat'l	COST / UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost				820						$17,400		$13,800	$800	$32,000
I	Full Scale Mock-up System				1,140						$23,100				$23,100
II	RCS Phase I, II, & III				1,743						$35,300				$35,300
III	Silo Waste Retrieval System				2,204						$44,600				$44,600
IV	Transfer Tank Area				4,520						$91,500				$91,500
	Demobilization Cost				1,400						$28,800	$8,200	$2,500	$3,500	$43,000
	Subtotal Direct Cost	1	LOT		11,827						$240,700	$8,200	$16,300	$4,300	$269,500

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Mobilization Cost														
D	Misc. Site Requirements, Barriers Etc.	1	lot		300	21.41			3500	2.50	$6,420		$3,500	$800	$10,720
D	Install barrier fencing and sign's	1	lot		40	20.27			300		$810		$300		$1,110
D	Install Utilities to Building	1	lot		480	21.12			10000		$10,140		$10,000		$20,140
	Total				820						$17,400		$13,800	$800	$32,000
	Demobilization Cost														
C	Punch list items	1	lot		300	20.27			1000	3.50	$6,080		$1,000	$1,080	$8,160
C	Decontaminate equipment	1	lot		500	20.27			1500	3.50	$10,140		$1,500	$1,800	$13,440
D	Remove Electrical to Trailer	1	lot		120	21.12				300	$2,530			$310	$2,840
D	Remove Utilitries to Building	1	lot		320	21.12				300	$6,760			$310	$7,070
D	Load Out Equipment	1	lot		160	20.27		8000.00			$3,240	$8,220			$11,460
	Total				1,400						$28,800	$8,200	$2,500	$3,500	$43,000

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.	Sub Item	Description	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
I	Full Scale Mock-up System						20.25									
D	A	Blower Skid	0.2	tn	150	41	20.25					$830				$830
D	B	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
	C	Waste Retrieval Equipt					20.25									
D		- Pipe Bridge from Silo 4 to TTA	15	tn	9	186	20.25					$3,770				$3,770
D		Sluicer Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Deployment Equipment	3	tn	40	165	20.25					$3,340				$3,340
D		Retrieval Equipment	1.5	tn	40	83	20.25					$1,680				$1,680
D		Discrete Object Housing	1.5	tn	40	83	20.25					$1,680				$1,680
D		CATS Housing	1	tn	60	83	20.25					$1,680				$1,680
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
D		Piping	700	lf	0.105	101	20.25					$2,050				$2,050
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		CAmera System	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	104						$2,100				$2,100
		Subtotal Direct Costs	1	LOT		1,140	20.26					23,100				$23,100

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II; & III															
D	A	Building - Concrete (380lf	355	cy	1.400	685	20.25					$13,870				$13,870
C	B	Equipt - Carbon Beds	9.2	tn	7	129	20.25					$2,610				$2,610
C		- Fans	0.4	tn	7	6	20.25					$120				$120
C		- HEPA Filters	0.7	tn	7	10	20.25					$200				$200
C		- Chillers	4	tn	7	56	20.25					$1,130				$1,130
C		- Condensate Pumps	0.4	tn	7	6	20.25					$120				$120
C		- Holdup Tank	2	tn	7	28	20.25					$570				$570
C		- Transfer Pump	0.6	tn	7	8	20.25					$160				$160
D		Metal Platform	1	tn	7	10	20.25					$200				$200
D		Ext'l Metal Ladder	0.2	tn	7	2	20.25					$40				$40
C	C	Ductwork - HVAC - 6"	400	lf	0.127	102	20.25					$2,070				$2,070
C		- Stack - 24"	150	lf	0.151	45	20.25					$910				$910
C		- Climate Control Unit Htrs	0.6	tn	7	8	20.25					$160				$160
C	D	Electrical - MCC	0.4	tn	7	6	20.25					$120				$120
C		- Local Load Cntr	0.1	tn	7	1	20.25					$20				$20
C		- 480 V SWGR	0.3	tn	7	4	20.25					$80				$80
C		- Lighting	0.1	tn	7	1	20.25					$20				$20
C		- Alarms	0.1	tn	7	1	20.25					$20				$20
C		- Rad Detectors	0.1	tn	7	1	20.25					$20				$20
C		Conduit (small)	500	lf	0.021	21	20.25					$430				$430
C		Cable Trays	100	lf	0.033	7	20.25					$140				$140
		Take-off Allowance			10%	114						$2,300				$2,300
		Subtotal Direct Cost	1	LOT		1,251	20.22					25,300				$25,300

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
II	RCS Phase I, II, & III con't.														
C	E Piping - 4" avg	600	lf	0.053	64	20.25					$1,300				$1,300
D	Concrete Slab @ Grade @1'	111	cy	0.459	70	20.25					$1,420				$1,420
D	Concrete Slab Elevated @ 1'	50	cy	3.603	248	20.25					$5,020				$5,020
D	Coated Concrete Walls 2"	37	cy	0.400	20	20.25					$410				$410
D	Footers	90	cy	0.366	45	20.25					$910				$910
	Take-off Allowance			10%	45						$910				$910
	Subtotal Direct Cost	1	LOT		492	20.33					$10,000				$10,000

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III	Silo Waste Retrieval System															
D	A	Pivoting Bridge	11	tn	7	106	20.25					$2,150				$2,150
D	B	Center Foundation	26	cy	0.400	14	20.25					$280				$280
D	C	Curved Plate Foundations	67	cy	0.400	37	20.25					$750				$750
D	D	Structural Truss & Tower	11	tn	7	106	20.25					$2,150				$2,150
D		Tower #2	2	tn	10	28	20.25					$570				$570
D		Curved Plate for Glide Track	12	tn	7	116	20.25					$2,350				$2,350
	E	Retrieval Equipt & Housing:					20.25									
C		- Sluicer Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		- Deployment Equipment	3	tn	40	241	20.25					$4,880				$4,880
C		- Retrieval Equipment	1.5	tn	40	120	20.25					$2,430				$2,430
C		- Discrete Object Housing	1.5	tn	40	120	20.25					$2,430				$2,430
C		- CATS Housing	1	tn	7	14	20.25					$280				$280
D		Test Bed I/S Steel	13.4	tn	7	129	20.25					$2,610				$2,610
C		Piping	700	lf	0.053	74	20.25					$1,500				$1,500
D		Conduit	500	lf	0.033	23	20.25					$470				$470
D		Pipe Bridge @35'h w/ 40' spans conc ftg	15	tn	7	145	20.25					$2,940				$2,940
C		RCS Round Duct	600	lf	0.127	153	20.25					$3,100				$3,100
C	F	Transfer Line (Silo to TTA) - 2"	300	lf	0.040	24	20.25					$490				$490
C	G	Air Equipt (for Air Track) - 2"	500	lf	0.040	40	20.25					$810				$810
C		Air Compressor	0.2	tn	7	3	20.25					$60				$60
C	H	Water Supply System 2"	500	lf	0.040	40	20.25					$810				$810
C		Hydraulic Line 2"	200	lf	0.040	16	20.25					$320				$320
D		Conduits	900	lf	0.033	41	20.25					$830				$830
		Take-off Allowance			10%	171						$3,460				$3,460
		Subtotal Direct Cost	1	LOT		1,881	20.26					$38,100				$38,100

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

FLUOR DANIEL FERNALD

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
III	Silo Waste Retrieval System con't.															
D	I	Control Trailer	6	tn	7	58	20.25					$1,170				$1,170
D	J	Trailers - Decon	6	tn	7	58	20.25					$1,170				$1,170
D		- Storage	6	tn	7	58	20.25					$1,170				$1,170
D		- Office	6	tn	7	58	20.25					$1,170				$1,170
D		- Break	6	tn	7	58	20.25					$1,170				$1,170
D	L	Camera System	0.4	tn	7	4	20.25					$80				$80
		Take-off Allowance			10%	29						$590				$590
		Subtotal Direct Cost	41	LOT		323	20.12					6,500				6,500

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DETAIL ESTIMATE WORKSHEETS

FLUOR DANIEL FERNALD

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4981003
CLIENT: DOE
WBS NO.: 2.1.3.G.0

DATE: 20-Aug-99
ESTIMATOR: T Wagner
LOCATION: FERNALD
TASK NO.: 4SWRA

ITEM NO.			QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
IV	Transfer Tank Area															
C	A	Storage Tanks 66'dia x 30'h	220	tn	2.700	1191	20.25					$24,120				$24,120
C	B	Decant Tank 38'dia x 30'h	34.2	tn	2.700	185	20.25					$3,750				$3,750
D	C	Structure w/Metal Roof	112.5	tn	2.700	418	20.25					$8,460				$8,460
D		w/ 12" concrete Floor	833	cy	0.459	527	20.25					$10,670				$10,670
D		w/ 2' concrete Walls	1600	cy	0.400	882	20.25					$17,860				$17,860
D		w/ 9" R/I conc Slab - Operating Deck (Par	625	cy	0.459	395	20.25					$8,000				$8,000
D		Concrete footers	266	cy	0.366	134	20.25					$2,710				$2,710
D	D	Sampling System Enclosure @2' thick	104	cy	0.400	57	20.25					$1,150				$1,150
D		Slurry Sample & Storage Bldg (3 Walls &	55	cy	0.400	30	20.25					$610				$610
D	E	Raw Water Tank	3.2	tn	3	12	20.25					$240				$240
	F	Mechanical Systems - Pumps														
C		TTA Transfer	0.4	tn	7	6	20.25					$120				$120
C		Makeup Water	0.1	tn	7	1	20.25					$20				$20
C		Sump	0.1	tn	7	1	20.25					$20				$20
C		Sluice	0.1	tn	7	1	20.25					$20				$20
C		HPU Pump	0.1	tn	7	1	20.25					$20				$20
C		Piping	750	lf	0.053	80	20.25					$1,620				$1,620
D	G	Electrical - MCC #2	3	cy	0.459	2	20.25					$40				$40
D	H	Lighting , Conduit	2000	lf	0.033	91	20.25					$1,840				$1,840
D		Cable Tray	500	lf	0.021	14	20.25					$280				$280
D	J	Heat (personal) Unit Htrs	0.4	tn	7	4	20.25					$80				$80
C	K	Ductwork	300	lf	0.127	76	20.25					$1,540				$1,540
C	M	Decant Sump	0.1	tn	7	1	20.25					$20				$20
		Take-off Allowance			10%	411						$8,320				$8,320
		Subtotal Direct Cost	1	LOT		4,520	20.24					$91,500				$91,500

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NO: C4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO. 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
	Operations & Maintenance Manpower														
21	Manpower	1	ls	3.50			10,713,216				37,496,256				$37,496,256
26	Spare Parts/Consumables	1	ls	3.00					302,769				908,307		$908,307
27	Health Physics	1	ls	1.00			486,300		3,491,100		486,300		3,491,100		$3,977,400
25	Electrical	1	ls	3.00					928,866				2,856,260		$2,856,260
25	Water	1	ls	3.00											
28	Subcontractor Support	1	ls	1.00				2,208,960				2,264,180			$2,264,180
24	Startup costs	1	ls	1.00				1,154,322	0			1,183,180			$1,183,180

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NC4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO. 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
22	WASTE DISPOSAL	6078	ea	1.00				1,590	5,275	2,100		9,905,621	32,862,986	13,082,895	$55,851,502

CONTRACTOR

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DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Cement Stabilization(FS)
ESTIMATE NC4981005
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 20-Aug-99
ESTIMATOR: J. ELLIS
LOCATION: FERNALD
TASK NO. 4S11B

ITEM NO.		QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
23	PROJECT MANAGEMENT														
	Project Manager	1	ea	20,800	20800	100.00					2,080,000				$2,080,000
	Adminstration Assistand	2	ea	20,800	41600	49.00					2,038,400				$2,038,400
	Contract Adminstrator	1	ea	20,800	20800	43.00					894,400				$894,400
	Contract Technical Repres	1	ea	20,800	20800	49.00					1,019,200				$1,019,200
	Site Integration	1	ea	20,800	20800	49.00					1,019,200				$1,019,200
	Environmental Compliano	1	ea	20,800	20800	45.00					936,000				$936,000
	Clerical	2	ea	20,800	41600	23.00					956,800				$956,800
	Quality Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Quality Engineer	2	ea	20,800	41600	44.00					1,830,400				$1,830,400
	Project Controls Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Project Controls Schedule	1	ea	20,800	20800	42.00					873,600				$873,600
	Project Controls Cost	1	ea	20,800	20800	42.00					873,600				$873,600
	Project Engineering Mana	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Project Engineers	2	ea	20,800	41600	54.50					2,267,200				$2,267,200
	Readiness Coordinator	1	ea	20,800	20800	42.50					884,000				$884,000
	Training Coordinator	1	ea	20,800	20800	42.50					884,000				$884,000
	Material Cost	1	lot						830,000				850,750		$850,750
	Take-off Allowance														
	Total Cost ITEM NO. 23	1	LOT		416,000	$48.80					20,300,800		850,800		$21,151,600

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CONTRACTOR

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COST IMPACT MATRIX SHEET

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Estimate No.: C4981004
Project: Silos 1 & 2 Chemical Stabilization (FS)
Client: DOE
WBS: 2.1.3.G.P

Est. Chg. No.: 4S11B
Date: 23-Aug-99
Estimator: J. ELLIS
Location: Fernald

Base Estimate Total	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Civil & Excav. All Facilities		Civil & Excav. All Facilities		Civil & Excav. All Facilities		Concrete All Facilities		Concrete All Facilities		Chemical Stabilization	
$37,810,860	Labor		Material				Labor		Material		PPE (Material)	
	Base $	$416,590	Base $	$79,850	Base $	$0	Base $	$4,737,700	Base $	$1,731,240	Base $	$73,650
Cost Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			0%	0%	-1%	15%				
Material Pricing			-1%	10%					-1%	10%	-1%	15%
Contamination	-1%	10%					-1%	10%				
Technology												
Regulations/Laws											-1%	10%
Quantity Variation	-1%	10%	-1%	15%	0%	0%	0%	10%	-1%	10%		
Project Definition	-1%	10%					-1%	5%				
Other												
Range - %	-4%	40%	-2%	25%	0%	0%	-3%	40%	-2%	20%	-2%	25%
Range - $	$399,926	$583,226	$78,253	$99,813	$0	$0	$4,595,569	$6,632,780	$1,696,615	$2,077,488	$72,177	$92,063
Distribution	Uniform		U		U		U		U		Uniform	
Correlation Rank												

[redacted]	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Structural Steel All Facilities		Structural Steel All Fac.		Arch./Buildings/Finishes All Fac.		Arch./Building/Finishes All Fac.		Equipment Systems 15 - 94		Equipment Systems 15 - 94	
	Labor		Material		Labor		Material		Labor		Equipment	
	Base $	$863,470	Base $	$1,301,110	Base $	$1,938,170	Base $	$2,101,400	Base $	$1,166,650	Base $	$13,882,540
Cost Drivers	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	15%			-1%	15%			-1%	20%		
Material Pricing			-1%	10%			0%	10%			-1%	20%
Contamination												
Technology												
Regulations/Laws												
Quantity Variation			-1%	10%			-1%	10%			-1%	10%
Project Definition	-1%	10%			-1%	15%			-1%	15%	-1%	10%
Other												
Range - %	-2%	25%	-2%	20%	-2%	30%	-1%	20%	-2%	35%	-3%	40%
Range - $	$846,201	$1,079,338	$1,275,088	$1,561,332	$1,899,407	$2,519,621	$2,080,386	$2,521,680	$1,143,317	$1,574,978	$13,466,064	$19,435,556
Distribution	Uniform		U		U		U		U		U	
Correlation Rank												

Analyst: _____

Client: _____

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COST IMPACT MATRIX SHEET

FLUOR DANIEL FERNALD
ESTIMATING SERVICES

Estimate No.: C4981004
Project: Silos 1 & 2 Chemical Stabilization (FS)
Client: DOE
WBS: 2.1.3.G.P

Est. Chg. No.: 4S11B
Date: 23-Aug-99
Estimator: J. ELLIS
Location: Fernald

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Piping Labor		Piping Material		Electrical Labor		Electrical Material		Electrical Equipment		Instrumentation Labor	
Cost Drivers	Base $	$547,780	Base $	$438,880	Base $	$2,853,790	Base $	$1,772,980	Base $	$1,349,620	Base $	$339,230
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity	-1%	10%			-1%	10%					-1%	10%
Material Pricing			-1%	15%			-1%	10%	-1%	20%		
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	5%	0%	10%			0%	10%	-1%	10%		
Project Definition	0%	5%			0%	10%			-1%	10%	0%	5%
Other												
Range - %	-1%	20%	-1%	25%	-1%	20%	-1%	20%	-3%	40%	-1%	15%
Range - $	$542,302	$657,336	$434,491	$548,600	$2,826,252	$3,424,548	$1,755,250	$2,127,576	$1,309,131	$1,889,468	$335,838	$390,116
Distribution	Uniform		U		U		U		U		Uniform	
Correlation Rank												

	Cost Element		Cost Element		Cost Element		Cost Element		Cost Element		Cost Element	
	Instrumentation Material		Paint / Insulation Labor		Paint/ Insulation Material							
Cost Drivers	Base $	$1,622,080	Base $	$467,660	Base $	$126,470	Base $	$0	Base $	$0	Base $	$0
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Productivity			0%	10%	-1%	10%						
Material Pricing	0%	15%										
Contamination												
Technology												
Regulations/Laws												
Quantity Variation	0%	5%										
Project Definition	0%	5%	0%	5%	0%	5%						
Other												
Range - %	0%	25%	0%	15%	-1%	15%	0%	0%	0%	0%	0%	0%
Range - $	$1,622,080	$2,027,600	$467,660	$537,809	$125,205	$145,441	$0	$0	$0	$0	$0	$0
Distribution	Uniform		U		U							
Correlation Rank												

Analyst: _____

Client: _____

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C.5.6 Project Management Estimate Basis: Chemical Stabilization — Other

C.5.6.1 Introduction

The project management cost estimate is summarized in **Table C.5.6-1**.

The project management cost for the Chemical Stabilization — Other alternative was prepared as detailed estimates based on Silos Project FY98 actuals, and the current Silos Project organizational charts.

TABLE C. 5.6-1
TOTAL PROJECT MANAGEMENT COST

Annual FDF Project Management Cost	$2,113,080
Silos 1 and 2 Remediation Schedule Duration	10 years
Total Project Management Cost	$21,130,800

<END OF PAGE>

C.5.6.2 Estimate Basis

The cost estimate basis for the project management cost of the Chemical Stabilization — Other alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.5.6.2.1 Assumptions

The following general assumptions were used to prepare the project management estimates:

1. Costs are expressed in FY99 dollars.
2. FDF project management labor is based on the current Silos Project organizational structure.
3. Throughout the project, FDF project management labor is dedicated 100% to supporting the Silos1 and 2 material full-scale remediation project.
4. Labor cost is based on a 40-hr/week schedule.
5. FDF project management for the Silos 1 and 2 material full-scale remediation project is a level-of-effort support throughout the project duration from FY00 thru FY10.

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C.5.6.2.2 Inclusions

The project management cost estimate includes the following cost elements:

- Project management labor; and
- Project management office supplies.

C.5.6.2.3 Exclusions

The following elements of cost are excluded from the project management cost estimate:

- Silos 1 and 2 material full-scale treatment facility capital cost;
- D&D cost;
- Premium time cost for overtime;
- Cost of operation of the FEMP AWWT and other site support functions (security, fire department, etc.);
- Waste shipping and transportation cost (container cost, transportation cost, burial cost);
- Silos 1 and 2 material full-scale remediation O&M; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.5.6.2.4 Format and Coding

The project management cost estimates are compiled and summarized into the following cost centers:

- FDF labor; and
- Material.

The following discussion provides a brief description of the cost centers.

FDF Labor Cost

FDF labor cost is the cost for FDF labor associated with project oversight and project management of the Silos 1 and 2 material full-scale remediation activities. This cost includes wages, benefits, and burdens. The FDF labor cost is based on the DOE approved FY99 planning labor rates.

Material Cost

Material cost is the cost for office supplies.

C.5.6.2.5 Methodology

The following methods were used to prepare the project management cost estimate:

FDF Labor Cost

An activity-based level-of-effort support estimate was developed using Silos Project FY98 actuals and the current Silos Project organizational structure. The FY99 plan labor rates were then applied to the labor resources to obtain the FDF project management labor cost estimate.

Material Cost

The material cost estimate is based on the Silos Project FY98 project management actual material cost.

C.5.6.2.6 References

The following references were used to prepare the project management cost estimate:

- Silos Project Organization Charts, dated July 23, 1999; and
- FY98 12-month spread for control account 4PM1A, "Project Management" from the FEMP project control system.

C.5.6.2.7 Attachment

The detailed project management cost summary for the Chemical Stabilization — Other (CHEM2) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.5.6.I

Project Management Cost Estimate Summary for

Chemical Stabilization — Other

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE N C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Project Management	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
23	PROJECT MANAGEMENT														
	Project Manager	1	ea	20,800	20800	100.00					2,080,000				$2,080,000
	Adminstration Assistand	2	ea	20,800	41600	49.00					2,038,400				$2,038,400
	Contract Adminstrator	1	ea	20,800	20800	43.00					894,400				$894,400
	Contract Technical Represent	1	ea	20,800	20800	49.00					1,019,200				$1,019,200
	Site Integration	1	ea	20,800	20800	49.00					1,019,200				$1,019,200
	Environmental Compliance	1	ea	20,800	20800	45.00					936,000				$936,000
	Clerical	2	ea	20,800	41600	23.00					956,800				$956,800
	Quality Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Quality Engineer	2	ea	20,800	41600	44.00					1,830,400				$1,830,400
	Project Controls Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Project Controls Scheduler	1	ea	20,800	20800	42.00					873,600				$873,600
	Project Controls Cost	1	ea	20,800	20800	42.00					873,600				$873,600
	Project Engineering Manager	1	ea	20,800	20800	60.00					1,248,000				$1,248,000
	Project Engineers	2	ea	20,800	41600	54.50					2,267,200				$2,267,200
	Readiness Coordiinator	1	ea	20,800	20800	42.50					884,000				$884,000
	Training Coordinator	1	ea	20,800	20800	42.50					884,000				$884,000
	Material Cost	1	lot						830,000				830,000		$830,000
	Take-off Allowance														
	Total Cost for ITEM NO. 23	1	LOT		416,000	$48.80					20,300,800		830,000		$21,130,800

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C.5.7 Waste Disposal Cost Estimate

C.5.7.1 Introduction

The waste disposal costs for the Chemical Stabilization — Other (CHEM2) alternative are summarized in Table C.5.7-1.

TABLE C. 5.7-1
WASTE DISPOSAL COST
CHEMICAL STABILIZATION — OTHER

Waste Disposal Containers Cost	$32,056,500
Transportation Cost	$12,822,600
Risk Budget	$1,694,010
NTS Burial Cost	$8,792,640
Total Waste Disposal Cost Estimate	$55,365,750

The waste disposal cost estimate for the CHEM2 alternative was prepared based on the waste loading assumptions documented in the **Basis of Design and Description (Appendix G)**, quotes for containers and transportation services, and FY99 NTS volumetric burial fees.

<END OF PAGE>

C.5.7.2 Estimate Basis

The cost estimate basis for the waste disposal cost of the Chemical Stabilization — Other (CHEM2) alternative is comprised of the following six sections:

- Assumptions,
- Inclusions,
- Exclusions,
- Format and coding,
- Methodology, and
- References.

C.5.7.2.1 Assumptions

The following general assumptions were used to prepare the estimates:

1. Costs are expressed in FY99 dollars.
2. The wasteform produced by the Chemical Stabilization — Other process is a monolith with 2% air pockets in the monolith.
3. Waste loading of the grout is 24 wt%.
4. Mode of transportation to the NTS is via truck.
5. Truckload capacity is 42,000 lb.
6. The wasteform produced by the Chemical Stabilization — Other process will have 1% of out of specification glass requiring rework.
7. The treated Silos 1 and 2 material is disposed at the NTS.
8. The treated Silos 1 and 2 material meets the NTS WAC.

C.5.7.2.2 Inclusions

The waste disposal cost estimate includes the following cost elements:

- Shipping containers;
- Shipment of the treated waste via truck to the NTS; and
- Disposal at the NTS.

C.5.7.2.3 Exclusions

The waste disposal cost estimate excludes the following elements:

- Silos 1 and 2 full-scale treatment facility capital cost;
- D&D cost;
- Disposal cost of D&D debris;
- Cost of operation of AWWT and other site support functions (security, fire department, etc.);
- Silos 1 and 2 material full-scale treatment facility O&M cost; and
- Cost of FEMP project management oversight (human resource, project control, environmental monitoring, etc.).

C.5.7.2.4 Format and Coding

The waste disposal cost estimate is compiled and summarized into the following cost centers:

- Waste disposal container;
- Transportation;
- NTS burial; and
- Risk budget.

C.5.7.2.4.1 Waste Disposal Container Cost

Waste disposal container costs are the costs for shipping containers with liners.

C.5.7.2.4.2 Transportation Cost

Transportation cost is FDF's cost for transporting the treated Silos 1 and 2 material to the NTS.

C.5.7.2.4.3 NTS Burial Cost

Burial costs are the costs for the burial and management of the material disposed at the NTS.

C.5.7.2.4.4 Risk Budget

Risk budget is added to the estimate for risk and uncertainties associated with waste loading, packaging and transportation.

C.5.7.2.5 Methodology

The methods used to prepare the waste disposal cost estimate are discussed next.

Waste Disposal Container Cost

The shipping container cost estimate is based on quotes from the POP contractor.

Table C.5.7-2 presents a summary of the containers required to dispose the treated Silos 1 and 2 material at the NTS.

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TABLE C. 5.7-2
WASTE DISPOSAL CONTAINER SUMMARY

Container	Quantity	Unit Cost	Total Cost
Shipping/disposal	6,106	$5,250 ea	$32,056,500

Transportation Cost

A total of 3,053 truck shipments is required to transport the treated Silos 1 and 2 material to the NTS. The transportation cost estimate is based on FY99 average shipping costs, via truck, to the NTS. The transportation cost estimate is $4,200 per truck shipment.

NTS Burial Cost

The burial cost estimate is based on the FY99 burial rate negotiated between the FEMP and the NTS. The burial cost estimate is based on a volumetric rate of $7.50 per cubic feet of waste disposed.

Risk Budget

The risk budget was calculated based on the potential risk associated with waste loading, shipping and waste disposal. The risk factor was determined by the FDF team based on technology, historical data and professional judgement (see **Table C.5.4-9**).

C.5.7.2.6 References

- **Basis of Design** and **Description (Appendix G)**.
- *POP Final Report* (**Appendix H, Attachment H4**).

C.5.7.2.7 Attachments

Detailed waste disposal cost summaries for the Chemical Stabilization — Other (CHEM2) alternative, prepared by the FDF cost estimating team, are attached to this section.

<END OF PAGE>

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Attachment C.5.7.I

Waste Disposal Cost Estimate Summary for

Chemical Stabilization — Other

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (FS)
ESTIMATE N C4981004
CLIENT: DOE
WBS NO.: 2.1.3.G.P

DATE: 22-Nov-99
ESTIMATOR J. ELLIS
LOCATION: FERNALD
TASK NO.: 4S11B

ITEM NO.	Waste Disposal	QTY	UNIT	MAN-HOURS Unit	MAN-HOURS Total	MAN-HOURS Rate	COST/UNIT Labor	COST/UNIT S/C	COST/UNIT Mat'l	COST/UNIT Equip	LABOR	S/C	MAT'L	EQUIP	TOTAL
22	WASTE DISPOSAL	6106	ea	1.00					5,250				32,056,500		$32,056,500
22	TRANSPORTATION	6106	ea	1.00				2,100				12,822,600			$12,822,600
31	NTS BURIAL FEE	6106	ea	1.00				1,440				8,792,640			$8,792,640

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Cement Stabilization
WASTE DISPOSAL

ITEM	BASIS		AMOUNT
NO. OF CONTAINER		6106	
CONTAINER COST		5250	$ 32,056,500.00
TRANSPORTATION	$2100 EACH		$ 12,822,600.00
DISPOSAL	192 CU. FT. EACH @ $7.50/CU. FT.		$ 8,792,640.00
TOTAL			$ 53,671,740.00

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C.5.8 Cost of Money Estimate

C.5.8.1 Cost of Money Analysis

Cost of money is the cost incurred by the Silos 1 and 2 material full-scale remediation contractor to finance the engineering cost, start-up cost, and capital cost. This cost assumes that the contract for the Silos 1 and 2 material full-scale remediation project will be structured similar to the Silo 3 project contract, which shifts the financial liability and risk of the project to the contractor. Thus, the contract requires the contractor to finance engineering, capital, and start-up cost and be reimbursed for these activities on a predetermined, pay-item schedule once operations are successful.

The cost of money in **Table C.5.8-1** was calculated by establishing a contractor's cash output and cash input schedule and applying a finance rate of 8.0%. The Silos 1 and 2 project remediation schedule in **Figure 3.5-2** was used as the basis for activity durations.

TABLE C. 5.8-1
COST OF MONEY FOR CHEMICAL STABILIZATION – OTHER

Cost of Money	$27,625,550

C.5.8.2 Attachment

The cost of money analysis summary for the Chemical Stabilization — Other (CHEM2) alternative, prepared by the FDF cost estimating team, is attached to this section.

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Attachment C.5.8.I

Cost of Money Estimate for

Chemical Stabilization — Other

Chemical Stabilization (cement other)

FLUOR DANIEL FERNALD
FULL SCALE REMEDIATION
COST OF MONEY MODEL
SILO 1 & 2 CHEMICAL STABILIZATION (other) F/S
SUBCONTRACTOR "PAY OUT" SCHEDULE

Pay Item Number	Description	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 Dollars)	$24,186,630	$8,162,287	$8,162,287	$8,162,287						
	TOTAL 1.0 (in ESCALATED Dollars)	$27,316,519	$8,850,825	$9,100,463	$9,365,231	$0	$0	$0	$0	$0	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 Dollars)	$51,257,943			$25,628,972	$25,628,972					
	TOTAL 2.0 (in ESCALATED Dollars)	$59,643,609	$0	$0	$29,406,128	$30,237,481	$0	$0	$0	$0	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 Dollars)	$1,164,320				$1,164,320					
	TOTAL 3.0 (in ESCALATED Dollars)	$1,361,886	$0	$0	$0	$1,361,886	$0	$0	$0	$0	$0
4.0	PRE-OPERATIONAL ASSESSMENT										
	TOTAL 4.0 (in 99 Dollars)										
	TOTAL 4.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 Dollars)	$32,293,830					$10,764,610.00	$10,764,610.00	$10,764,610.00		
	TOTAL 5.0 (in ESCALATED Dollars)	$40,355,511	$0	$0	$0	$0	$13,069,399	$13,448,511	$13,837,600	$0	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Dollars)										
	TOTAL 6.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Dollars)	$24,548,400								$24,548,400	
	TOTAL 7.0 (in ESCALATED Dollars)	$32,466,329	$0	$0	$0	$0	$0	$0	$0	$32,466,329	$0
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Dollars)										
	TOTAL 8.0 (in ESCALATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN 99 DOLLARS	$133,741,353	$8,162,287	$8,162,287	$33,791,258	$26,783,292	$10,764,610	$10,764,610	$10,764,610	$24,548,400	$0
	TOTAL FOR "SPEND OUT" FOR PAY ITEMS IN ESCALATED DOLLARS	$161,143,854	$8,850,825	$9,100,463	$38,771,360	$31,599,367	$13,069,399	$13,448,511	$13,837,600	$32,466,329	$0
			$8,162,287	$16,324,573	$50,115,831	$76,899,123	$87,663,733	$98,428,343	$109,192,953	$133,741,353	$133,741,353

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hemical Stabilization (cement other)

SUBCONTRACTOR "PAY IN" SCHED JLE

Pay Item Number	Descrip ion	Total Amount	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
1.0	PRE-MOBILIZATION										
	TOTAL 1.0 (in 99 D lars)	$24,486,660		$0	$0	$0	$6,121,716	$6,121,715	$12,243,430		
	TOTAL 1.0 (in ESCA LATED Dollars)	$30,819,025	$0	$0	$0	$0	$7,432,423	$7,648,020	$15,738,582	$0	$0
2.0	MOBILIZATION & CONSTRUCTION										
	TOTAL 2.0 (in 99 D lars)	$51,257,943				$0	$ 12,814,486	$ 12,814,486	$ 25,628,972		
	TOTAL 2.0 (in ESCA LATED Dollars)	$64,512,960	$0	$0	$0	$0	$15,558,170	$16,009,475	$32,945,315	$0	$0
3.0	START-UP PREPARATIONS										
	TOTAL 3.0 (in 99 D lars)	$1,154,820				$0	$288,580	$288,580	$577,161		
	TOTAL 3.0 (in ESCA LATED Dollars)	$1,452,821	$0	$0	$0	$0	$350,367	$360,531	$741,923	$0	$0
4.0	PRE-OPERATIONAL ASSES SMENT										
	TOTAL 4.0 (in 99 Do lars)										
	TOTAL 4.0 (in ESCA ATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5.0	WASTE TREATMENT										
	TOTAL 5.0 (in 99 D lars)	$32,293,830					$8,073,458	$8,073,458	$16,146,915	$0	
	TOTAL 5.0 (in ESCA ATED Dollars)	$40,644,834	$0	$0	$0	$0	$9,802,049	$10,086,384	$20,756,401	$0	$0
6.0	FINAL WASTE TREATMENT										
	TOTAL 6.0 (in 99 Do lars)										
	TOTAL 6.0 (in ESCA ATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7.0	FACILITY SHUTDOWN AND DISMANTLEMENT										
	TOTAL 7.0 (in 99 Do lars)	$24,548,400								$24,548,400	
	TOTAL 7.0 (in ESCA ATED Dollars)	$32,466,329	$0	$0	$0	$0	$0	$0	$0	$32,466,329	$0
8.0	DEMOBILIZATION										
	TOTAL 8.0 (in 99 Do lars)										
	TOTAL 8.0 (in ESCA ATED Dollars)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL FOR "PAY IN" FOR PAY ITEMS	IN 99 DOLLARS	$133,741,353	$0	$0	$0	$0	$27,298,238	$27,298,238	$54,596,477	$24,548,400	$0
TOTAL FOR "PAY IN" FOR PAY ITEMS	IN ESCALATED DOLLARS	$169,895,968	$0	$0	$0	$0	$33,143,009	$34,104,410	$70,182,220	$32,466,329	$0
			$0	$0	$0	$0	$27,298,238	$54,596,477	$109,192,953	$133,741,353	$133,741,353

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Chemical Stabilization (cement other)

COST OF MONEY CALCULATION	COST OF MONEY RATE/YR		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10
MONTHLY "PAY OUT" AMOUNTS	Prime Rate 8/4/99		$8,162,287	$8,162,287	$33,791,258	$26,783,292	$10,764,610	$10,764,610	$10,764,610	$24,548,400	$0
PLUS - YEARLY COST OF MONEY INCREME	8.00%		0	$652,983	$1,358,205	$4,170,162	$6,646,438	$5,855,463	$5,001,209	$1,894,757	$2,046,337
LESS - YEARLY " PAY IN" AMOUNTS			$0	$0	$0	$0	$27,298,238	$27,298,238	$54,596,477	$24,548,400	$0
OUTSTANDING YEARLY INCREMENTAL VALUES			$8,162,287	$8,815,270	$35,149,463	$30,953,453	($9,887,190)	($10,678,166)	($38,830,657)	$1,894,757	$2,046,337
OUTSTANDING CUMULATIVE VALUES			$8,162,287	$16,977,556	$52,127,019	$83,080,472	$73,193,281	$62,515,116	$23,684,458	$25,579,215	$27,625,552
CUMULATIVE COST OF MONEY FY99		**$ 27,625,552**	**$0**	**$652,983**	**$2,011,187**	**$6,181,349**	**$12,827,787**	**$18,683,249**	**$23,684,458**	**$25,579,215**	**$27,625,552**
CUMULATIVE COST OF MONEY		**$ 91,159,280**									

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