MASTER

ACTINIDE PARTITIONING-TRANSMUTATION PROGRAM

FINAL REPORT.

**V. PRECONCEPTUAL DESIGNS AND COSTS OF PARTITIONING
FACILITIES AND SHIPPING CASKS (APPENDIX 4)**

**FFP-WTF
COST ESTIMATES**

Report prepared by

The Ralph M. Parsons Company

Engineers/Constructors

Pasadena, California 91124

for

OAK RIDGE NATIONAL LABORATORY

Oak Ridge, Tennessee 37830

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

The following pages are an exact
representation of what is in the original
document folder.

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

*ACTINIDE PARTITIONING-TRANSMUTATION PROGRAM
FINAL REPORT.*

*V. PRECONCEPTUAL DESIGNS AND COSTS OF PARTITIONING
FACILITIES AND SHIPPING CASKS (APPENDIX 4)*

FFP-WTF
COST ESTIMATES

JUNE 1980

Report prepared by

THE RALPH M. PARSONS COMPANY
Pasadena, California 91124
Under Purchase Order No. 85B31056X-01

for

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830

operated by

UNION CARBIDE CORPORATION
NUCLEAR DIVISION

for the

DEPARTMENT OF ENERGY
Under Contract No. W-7405-eng-26

Job No. 5872-1

CONTENTS

Account		<u>PAGE</u>
--	Introduction.	iii
--	Cost Summaries.	1
2000	Land Improvements	4
3000	Building	
	Electrical	8
	Civil, Architectural, Mechanical	23
	Office, Guard House	44
5000	Other Structures	
	General.	50
	Mock-Up Facility	53
6000	Special Facilities	
	Equipment.	54
	Cation Exchange Chromatography (SK-MP-1).	55
	CMP Extraction (SK-MP-2 & 3).	70
	Nitric Acid Recovery (SK-MP-4).	102
	Salt Waste Treatment (SK-MP-5 & 6).	122
	Solid Alpha Waste Treatment (SK-MP-7)	151
	Service Utilities (SK-MP-40, 40A, 41)	173
	Piping	223
	Instruments.	224
	Computer	226
	Insulation	227
7000	Utilities	
	Shipping Cask Haulers.	228
	Tunnel Piping.	229
	Electrical	230
	Tunnels and Railroads.	240
	Shipping Cask.	243

INTRODUCTION

This Appendix contains cost estimate documents for the Fuels Fabrication Plant Waste Treatment Facility. Plant costs are summarized by Code of Accounts and by Process Function. Costs contributing to each account are detailed.

Process equipment costs are detailed for each Waste Treatment Process. Service utility costs are also summarized and detailed. Shipping cask costs are provided.

TABLE 5.5
FFP-WTF COST ESTIMATE BY CODE OF ACCOUNTS
Mid-1979 Dollars

<u>Account</u>	<u>Material Expense</u>	<u>Labor</u>	<u>Total</u>
2000 Land Improvement	1,030,600	945,700	1,976,300
3000 Building	49,846,400	41,292,600	91,139,000
5000 Other Structures	12,357,300	4,684,400	17,041,700
6000 Special Facilities	36,641,200	14,246,900	50,888,100
7000 Utilities	<u>7,399,300</u>	<u>11,325,900</u>	<u>18,725,200</u>
Sub-Total	107,274,800	72,495,500	179,770,300
Field Indirects and S/C's OH&P			<u>72,495,500</u>
Sub-Total			252,265,800
Engineering/Design/Project Management Conceptual, Titles I, II, III (28%)			<u>70,634,400</u>
Sub-Total			322,900,200
Contingency (35%)			<u>113,099,800</u>
TOTAL			436,000,000

TABLE 5.6
FFP-WTF COST ESTIMATE - BY FUNCTION
Mid-1979 Dollars

	<u>Material Expense</u>	<u>Labor</u>	<u>Total</u>
Land Improvement Including Railroad	1,180,600	1,049,200	2,229,800
Process Canyon/Mechanical Support Facilities	85,976,100	55,128,700	141,104,800
Tunnel and Piping	5,790,100	10,850,100	16,640,800
Support Facilities and Utilities	<u>14,378,000</u>	<u>5,467,500</u>	<u>19,795,500</u>
Sub-Total	107,274,800	72,495,500	179,770,300
Field Indirects and S/C's OH&P			<u>72,495,500</u>
Sub-Total			252,265,800
Engineering/Design/Project Management Conceptual, Titles I, II III (28%)			<u>70,634,400</u>
Sub-Total			322,900,200
Contingency (35%)			<u>113,099,800</u>
TOTAL			436,000,000

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE <u>8-3-79</u>		SHEET <u> </u> OF <u> </u>				
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>LN</u>				
UNIT/AREA	QUANTITY	UNIT	COST OR M/HR PER UNIT			SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION			MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY										
ACCNT										
	<u>SUMMARY</u>									
2000	LAND IMPROVEMENTS					1030600		78878	945700	1976300
3000	BUILDING - ELECTRICAL					2821500		76250	1223100	4044600
3000	BUILDING - CIVIL, ARCHITECTURAL MECHANICAL					46564900		2702475	39672300	86237200
3000	BUILDING - OFFICE, GUARD HOUSE					460000		27060	397200	857200
5000	OTHER STRUCTURES - GENERAL					1395300		148396	1997400	3392700
5000	OTHER STRUCTURES - MOCK-UP FACILITY					10962000		170582	2687000	13649000
6000	SPECIAL FACILITIES - EQUIPMENT					17170200		102984	1706900	18877100
6000	SPECIAL FACILITIES - PIPING					12620000		549199	9600000	22220000
6000	SPECIAL FACILITIES - INSTRUMENTS					3365000		64423	1083000	4448000
6000	SPECIAL FACILITIES - COMPUTER					2366000		31608	507000	2873000
6000	SPECIAL FACILITIES - INSULATION					1120000		81720	1350000	2470000
7000	UTILITIES - SHIPPING CASK HAULERS					410000		462	7700	417700
7000	UTILITIES - TUNNEL PIPING					1150000		51490	900000	2050000
7000	UTILITIES - ELECTRICAL					1049200		22730	364600	1413800
7000	UTILITIES - TUNNELS & RAILROAD					4790100		746922	10053600	14843700
	SUBTOTAL					107274800		4855179	72495500	179770300
	FIELD INDIRECTS & S/C'S OH&P									72495500
	SUBTOTAL									252265800
	CONCEPTUAL TITLE I, II, III ENGINEERING & PROJECT MANAGEMENT - 28%									70634400
	SUBTOTAL									322900200
	CONTINGENCY - 35%									113099800
	TOTAL									436000000

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

CES-4903-0

DATE _____

SHEET 1 OF 4MTO BY _____
PRICED BY _____

JOB NO.: 5872-1 CLIENT: DOE

TYPE OF ESTIMATE:

CHECKED BY: *RL*

PROJECT: OAKRIDGE NATIONAL LAB - TENN.

Acct. No.

FFP-WTF

Qty

Unit

Cost/Unit

Matl

Hr

Labor
\$Materials
&
Expense

Subcontract

Hours

Dollars

Labor

Hours

Dollars

Total
Dollars

2000

LAND IMPROVEMENT - SUMMARY

RESERVIOR - WATER PONDS and
LLL LEACH BED

267 100

31 149

EXCAVATED MAT'L HAULING

—

7368

LANDSCAPING and SPRINKLER

114 100

5914

ROADS, PARKING, FENCING
and ETC.

649 400

18 671

SUB TOTAL

PROD. (63 102 ÷ 80 % LESS

63 102)

1 030 600

63 102

15 776

TOTAL, 2000 - FFP

11.99

1 030 600

78 878

945 700

1 976 300

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF	
ZIGGY Z		4P		JUL. 79		4		4	
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:			
5872-1		DOE		PRE-CONCEPT		MC			
UNIT/AREA		DESCRIPTION		CAPACITY		ACCNT			
DAKRIDGE NATIONAL LAB.		FFP-WTF							
QUANTITY		UNIT		COST OR M/HR PER UNIT		MATERIAL EXPENSE		SUBCONTRACT	
				MATL M/H LAB \$				LABOR	
								M/HR DOLLARS	
								M/HR DOLLARS	
								TOTAL LLARS	
2000	LAND IMPROVEMENT								
	CONCRETE RAMP - 6" TK	65	CY	61.-	5.-		4 000		325
	CONC. WALK / PAVING - 4" TK	185	/	61.-	5.-		11 300		925
	ROADS and PARKING 4" A.C. ON 12" AGG. BASE	656 100	SF	.70	.02		459 300		13 122
	OVERFLOW BASIN 2" A.C. ON 6" AGG. BASE	63 200	SF	.40	.01		25 300		632
	FENCE and GATES								
	CHAIN LINK FENCE 8' HIGH w/ 6 - V STRAND BARB WIRE	11 700	LF	8.-	.25		93 600		2925
	SLIDING ELEC. GATES :								
	- 60' OPENING - DOUBLE	2	PR	3400	32		6 800		64
	- 80' " - "	5	/	4200	40		21 000		206
	- 40' " - "	-	/	-	-				
	- 40' " - SINGLE	1	EA	2600	24		2 600		24
	- 20' " - "	4	EA	1800	16		7 200		64
	- 20' " - "	2	/	1800	16		3 600		32
	- 30' " - "	1	/	2200	20		2 200		20
	VERTICAL LIFT ELEC. GATES								
	- 20' OPENING - SINGLE	2	/	2500	24		5 000		48
	FLAG POLES 60' HIGH w/ CONC. FT'G	2	EA	2000	20		4 000		40
	REMOVE SHRUB / TREES and STUMP 1" φ	100	EA	35.	2.5		3 500		250
	TOTAL, MISC. ITEMS						649 400		18 671

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>F.J.M</u>		PRICED BY		DATE <u>6-13-79</u>				SHEET <u>3</u> OF <u>15</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>ORNL/UCC</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>				CKD BY: <u>THS</u>						
UNIT/AREA <u>P&T - FEP - WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE			SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>NEW BUILDING - 3000</u>				MATL	M/H	LAB \$				M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY														
ACCNT														
3201	LIGHTING													
	COLD AREA LIGHTING BASED UPON		LS				67000				2232			
	372,000 ft ² @ 2 W/ft ²													
	(FLUORESCENT & HPS)													
	INCLUDE 80 EXIT LIGHTS													
	(SAME AS FRP PRICING)													
*	CANYON & ALCOVE LIGHTING, 277V, HPS	205	E	1200	8.00		246000				1640			
*	LIGHTING PENETRATIONS TO HOT AREAS	265	LS				265000				530			
	WIRING EXTERNAL TO CELLS FOR													
	255 FIXTURES - 277VOLTS													
	BALLASTS 2/BOX HPS	127	E	1500	1.50		1910				191			
	AREA LIGHTING MTD ON BLDG													
	400W HPS WP FLOODLIGHTS	18	E	350	2.00		6300				36			
	1" RSS	3400	FT	.83	.10		2820				340			
	1" SUPPORTS	587	E	1.29	.25		730				142			
	1" FITTINGS (10% OF CONE)	1	LS	-	-		360				48			
	#6 AWG 600V	11000	FT	.20	.014		2200				154			
	QA LEVEL II *only													
							592320				5313			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>F.J.M.</u>		PRICED BY		DATE <u>6-12-79</u>		SHEET <u>4</u> OF <u>15</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>ORNL/UEC</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>THS</u>						
UNIT/AREA <u>P&T FFP-WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>NEW BUILDING - 3000</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>ELECTRICAL</u>												
<u>3702</u>	<u>POWER DISTRIBUTION</u>											
	<u>MCC-F-1 2400V</u>	<u>1</u>	<u>E</u>	<u>26K</u>	<u>130</u>		<u>26 000</u>			<u>130</u>		
	<u>MCC-F-2 480V</u>	<u>1</u>	<u>E</u>	<u>26K</u>	<u>130</u>		<u>26 000</u>			<u>130</u>		
	<u>MCC-F-3 480V</u>	<u>1</u>	<u>E</u>	<u>36SK</u>	<u>182</u>		<u>36 500</u>			<u>182</u>		
	<u>MCC-F-4 480V</u>	<u>1</u>	<u>E</u>	<u>33K</u>	<u>165</u>		<u>33 000</u>			<u>165</u>		
	<u>MCC-F-5 480V</u>	<u>1</u>	<u>E</u>	<u>21K</u>	<u>105</u>		<u>21 000</u>			<u>105</u>		
	<u>MCC-F-6 480V</u>	<u>1</u>	<u>E</u>	<u>61K</u>	<u>305</u>		<u>61 000</u>			<u>305</u>		
	<u>MCC-F-7 480V</u>	<u>1</u>	<u>E</u>	<u>61K</u>	<u>305</u>		<u>61 000</u>			<u>305</u>		
<u>*</u>	<u>MCC-F-E1 480V</u>	<u>1</u>	<u>E</u>	<u>45K</u>	<u>225</u>		<u>45 000</u>			<u>225</u>		
	<u>DIST PNL DP-F-1</u>	<u>1</u>	<u>E</u>	<u>3500</u>	<u>18</u>		<u>3 500</u>			<u>18</u>		
	<u>- F-2</u>	<u>1</u>	<u>E</u>	<u>3200</u>	<u>16</u>		<u>3 200</u>			<u>16</u>		
	<u>- F-3</u>	<u>1</u>	<u>E</u>	<u>3500</u>	<u>18</u>		<u>3 500</u>			<u>18</u>		
<u>*</u>	<u>- F-E1</u>	<u>1</u>	<u>E</u>	<u>2100</u>	<u>11</u>		<u>2 100</u>			<u>11</u>		
	<u>LIGHTING PANELS F-1 to F-28</u>	<u>28</u>	<u>E</u>	<u>900</u>	<u>5.00</u>		<u>25 200</u>			<u>140</u>		
	<u>RECEPTACLE PNLS F-1 to F-30</u>	<u>30</u>	<u>E</u>	<u>600</u>	<u>4.00</u>		<u>18 000</u>			<u>120</u>		
	<u>QA Level II * only</u>						<u>365 000</u>			<u>1870</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>F.J.M</u>		PRICED BY		DATE <u>6-12-79</u>		SHEET <u>5</u> OF <u>15</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>ORNL/UCL</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>THH</u>						
UNIT/AREA <u>P&T FEP-WTF</u>		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>NEW BUILDING - 3000</u>				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCT												
<u>ELECTRICAL</u>												
<u>3202</u>	<u>POWER DISTRIBUTION</u>											
	<u>RECEPTACLES - 480V, 3P CH ARE 3372</u>	<u>60</u>	<u>E</u>	<u>58.10</u>	<u>1.00</u>		<u>3490</u>			<u>60</u>		
	<u>60A-3P - 4500 SW</u>	<u>60</u>	<u>E</u>	<u>34.10</u>	<u>1.50</u>		<u>2050</u>			<u>90</u>		
	<u>RECP WIRING - 3/4" C 3#8 @ 150 FT</u>	<u>5100</u>	<u>FT</u>	<u>1.80</u>	<u>.22</u>		<u>9180</u>			<u>1122</u>		
	<u>" " - 1" C 6#8 @ 150 FT</u>	<u>2100</u>	<u>FT</u>	<u>2.78</u>	<u>.29</u>		<u>5840</u>			<u>609</u>		
	<u>150 AMP</u>											
	<u>480V FDR CKTS - 15A 3/4" C 4#12</u>	<u>10</u>	<u>E</u>	<u>230-</u>	<u>32</u>		<u>2300</u>			<u>320</u>		
	<u>- 30A</u>											
	<u>- 50A 1" C 3#6 d 1#10</u>	<u>26</u>	<u>E</u>	<u>352-</u>	<u>41-</u>		<u>9100</u>			<u>1066</u>		
	<u>- 100A 1 1/2" C 3#1/0 d 1#6</u>	<u>3</u>	<u>E</u>	<u>744-</u>	<u>60</u>		<u>2230</u>			<u>180</u>		
	<u>- 150A 2" C 3#2/0 d 1#4</u>	<u>4</u>	<u>E</u>	<u>962-</u>	<u>82</u>		<u>3850</u>			<u>328</u>		
	<u>- 200A 2" C 3#4/0 d 1#4</u>	<u>2</u>	<u>E</u>	<u>1199-</u>	<u>76-</u>		<u>2400</u>			<u>152</u>		
	<u>- 225A 2 1/2" C 3-250MCM 1#3</u>	<u>2</u>	<u>E</u>	<u>1647</u>	<u>96</u>		<u>3290</u>			<u>192</u>		
	<u>LIGHTING XFMRs - 15KVA, 480-208/120</u>	<u>10</u>	<u>E</u>	<u>532-</u>	<u>12-</u>		<u>5500</u>			<u>120</u>		
	<u>- 30KVA, 480-208/120</u>	<u>20</u>	<u>E</u>	<u>920-</u>	<u>14-</u>		<u>18400</u>			<u>280</u>		
	<u>PAR CKTS</u>	<u>11</u>	<u>E</u>									
	<u>2" C, 25#12 EA 150 FT</u>	<u>11</u>	<u>E</u>	<u>818-</u>	<u>88</u>		<u>9000</u>			<u>968</u>		
	<u>3/4" C, 4#10 EA 150 FT</u>	<u>11</u>	<u>E</u>	<u>255-</u>	<u>43-</u>		<u>2810</u>			<u>473</u>		
	<u>PENETRATIONS 11 @ 800</u>	<u>11</u>	<u>E</u>	<u>800-</u>	<u>2.00</u>		<u>8800</u>			<u>22</u>		
	<u>TAG LINK 150'</u>	<u>1</u>	<u>LS</u>	<u>-</u>	<u>-</u>		<u>350</u>			<u>12</u>		
	<u>2nd LEVEL IT * ONLY</u>						<u>88590</u>			<u>5994</u>		

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY F.J.M.		PRICED BY		DATE C-13-79		SHEET 8 OF 15						
JOB NO.: 5872-1		CLIENT: ORNL/UCC		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: TMS						
UNIT/AREA P & T FFP-INTF		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION NEW BUILDING - 3000				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCNT												
ELECTRICAL												
3202	POWER DISTRIBUTION											
	RECEPTACLES & WIRING - COLD AREAS - BASED ON 372,000 FT ² @ 1 WATT/FT ² (.12 MTL & .01 M/H)	LS					44640				3720	
	MISC POWER CKTS - 120V 144 CKTS AVERAGE LENGTH 100' 3/4" C-4#12	144	E	150	20		21600				2880	
	POWER SUPPLY FOR WTE-FFP-HEPA 1200A @ 40V 1200A-BUS 1/2 Sump (100') Cove. SHED	1	LS				16200				100	
		1	LS				6000				30	
		1	LS				500				40	
	POWER SUPPLY FOR WTE-FFP-ASH 2400A @ 40V	1	LS				25500				50	
	2400A BUS ASSEMBLY Cove. SHED	1	LS				15000				100	
		1	LS				500				40	
							129940				6960	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>FJM</u>		PRICED BY		DATE <u>6-13-79</u>		SHEET <u>9</u> OF <u>15</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>ORNL/UCL</u>		TYPE OF ESTIMATE:		CKD BY: <u>ms</u>						
UNIT/AREA <u>P&T FFP-WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUECONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>NEW BUILDING - 3000</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
3202	POWER DISTRIBUTION											
	BLDS GROUNDING GRID											
	#4/0	5200	FT	1.004	.036		5220			187		
	THERMOWELDS	100	E	1.80	.80		180			80		
	INSTR GROUND 1" C #4/0	300	FT	2.99	.04		900			12		
	INSTR GROUND TERMINAL BAR	2	E	10-	2.00		20			4		
	LIGHTNING PROTECTION 263,000 ft ²											
	(PERIMETER = 3000 FT)											
	AIR TERM 3000 FT PERIMETER + CENTER)	380	E	30-	1.50		11400			570		
	CABLE PERIM + CROSS RUNS	6000	FT	1.004	.036		6020			216		
	18.75 #/1000 FT, 29 STRAND											
	DOWN CONDUCTORS SD @ 60 FT	3000	FT	1.004	.036		3010			108		
	18.75 #/1000 FT, 29 STRAND											
	MASTER LABEL	145	-	-	-		200			10		
	CHECKOUT POWER SYSTEM COMPLETE	145	-	-	-		-			100		
	END RODS 3/4 x 10'	570	E	15-	1.50		750			75		
							27700			1362		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY F.J.M.		PRICED BY		DATE 6-13-79		SHEET 12 OF 15						
JOB NO.: 5872-1		CLIENT: ORNL/UCC		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: MS						
UNIT/AREA P&T EEP-WTF		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION NEW BUILDING - 3000				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
ELECTRICAL												
3303	FIRE ALARM & SECURITY											
	INTEGRATED FA & SECURITY SYS	1	LS	200K			200,000			1000		
	OPERATOR CONTROL CONSOLE WITH											
	DISPLAY MODULE & PRINTER.											
	DOOR SWITCHES, WINDOW MONITORS,											
	INFRARED DETECTORS,											
	MANUAL FA STA, PULS DETECTORS											
	IONIZATION DETECTORS, & ALARM BELLS											
	SYSTEM TO USE MULTIPLEX TRANSMISSION.											
	TOTAL 470 FIELD DEVICES											
	3/4" RGS	7000	FT	.62	.08		4340			560		
	" SUPPORTS	1167	E	1.26	.24		1470			280		
	" FITTINGS	1	LS	-	-		580			84		
	1" C RGS	2000	FT	.83	.10		1660			200		
	" SUPPORTS	333	E	1.29	.25		430			83		
	" FITTINGS	1	LS	-	-		210			28		
	WIRE 2/C #18	70,000	FT	.043	.010		3010			700		
	CHECKOUT	1	LS				-			16		
							211700			2951		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY F.J.M.		PRICED BY		DATE 6-13-79		SHEET 13 OF 15						
JOB NO.: 5872-1		CLIENT: ORNL/UCC		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: JMA						
UNIT/AREA P&T FFP-WTF		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION NEW BUILDING				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
3303 SECURITY TV SYSTEM												
TV CAMERAS w/P&TILT		4	E	3200	3.00		12800			12		
14" MONITORS		4	E	835	1.50		3340			6		
TV CABLE - RG-11		1500	F7	1.50	.008		2250			12		
MULTIPLEX CRT		4	E	1700	3.00		6800			12		
TP CABLE 2/C #18		1500	F7	.043	.010		60			15		
3/4" RGS		3000	F7	.62	.08		1860			240		
1 SUPPORTS		500	E	1.26	.24		630			120		
1 FITTINGS		1	LS	-	-		280			36		
EQUIPMENT RACK ASSEMBLED		1	LS				3000			18		
CANYON CCTV SYS												
1 1/2" RGS		400	F7	1.28	.14		510			56		
1 SUPPORTS		67	E	1.45	.25		100			17		
1 FITTINGS		1	LS	-	-		60			7		
TV CABLE MULTI CONDUCTOR		500	F7	2.44	.05		1220			25		
EQUIP RACK ASSEMBLED		1	LS				2000			18		
QA LEVEL II							34880			594		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

BUILDING-CIVIL
ARCH., MECH. (3000)

ESTIMATE WORKSHEET

DATE JULY '79SHEET 1 OF 13

MTO BY _____

PRICED BY 1JOB NO.: 5872-1CLIENT: DOETYPE OF ESTIMATE: PRE-CONCEPTCHECKED BY: ALPROJECT: OAKRIDGE NATIONAL LAB. - TENN

Acct. No.

BUILDINGS MAIN FFP-WTF

Qty

Unit

Cost/Unit

Matl

Hr

Labor
\$Materials
&
Expense

Subcontract

Hours

Dollars

Labor

Hours

Dollars

Total
Dollars

3000

SUMMARY

SF

EARTHWORK

CONCRETE WORK

MASONRY

METALS

WOOD and PLASTICS

MOISTURE PROTECTION

DOORS and WINDOWS

FINISHES

BUILDING SPECIALTIES

EQUIPMENT

SPECIAL CONSTRUCTION

CONVEYING SYSTEM

MECHANICAL - PLUMBING

- FIRE PROTECTION

SUB-TOTAL

PROD. (2 089 857 ÷ 80 %

H V A C

SUB-TOTAL

ELECTRICAL

TOTAL, MAIN BLDG, FFP

20 757 000

238 800

1 284 800

45 000

514 400

200 000

1 591 500

90 500

116 400

15 138 800

2 654 400

240 000

390 000

20 756

1 727 752

24 205

22 095

1 250

17 707

3 713

96 828

942

1 400

150 177

7 100

8 000

7 032

43 311 600

2 089 857

522 464

90 154

2 702 475

14.68

46 564 900

39 672 300

86 237 200

(EXCLUDED IN THIS ACCT)

46 564 900

39 672 300

86 237 200

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY Z.Z. AL WEAVER		PRICED BY 4P		DATE JULY '79		SHEET 2 OF 13						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: LW						
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
ACCNT												
3000	MAIN BLDG -											
	<u>EARTHWORK</u>											
	EXCAVATION	119 400	CY	-	.10						11 940	
	BACKFILL	55 100	CY	-	.16						8 816	
	SURPLUS -	122 800	CY	-	-		(INCLUDED IN	2000 ACCT)				
	TOTAL EARTHWORK										20 756	
	<u>CONCRETE WORK</u>											
	WALLS - INT/EXT, 3 rd TK AVE	69 400	CY	97.-	15.5		6 731 800				1 075 700	
	SLAB ON GRADE	14 000	/	61.-	5.-		854 000				70 000	
	SUSPENDED SLAB	45 000	/	66.-	5.-		2 970 000				225 000	
	COLUMNS OVER 24" ϕ	460	/	120.-	18.7		55 200				8 602	
	REBAR 128 860 CY @ 270 #	128 860	CY									
		17 400	TN	400.	20.		6 960 000				348 000	
	PENETRATIONS @ CELL WALLS, S.S., 2" ϕ X 6' LG (AVE) PIPE, Z TYPE W/ 1 FLANGE + 1 GRAYLOC HUB @ ENDS	900	EA	3540	.5		3 186 000				450	
	ELEC. PENETRATIONS						(INCLUDED IN	ELEC.)				
	TOTAL, CONC. WORK	128 860		161	13.4 ⁰		20 757 000				172 752	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
Z.Z. AL WEAVER		4P		JUL '79		3		13				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
		DOE		PRE-CONCEPT		LW						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
3000	MAIN BLDG.											
	MASONRY											
	CONC. MASONRY BLK.	107 500	SF	1.50	.13		161 300				13 975	
	FACE BRICKS	31 000	/	2.50	.33		77 500				10 230	
	TOTAL, MASONRY						238 800				24 205	
	METALS											
	METAL DECKING, ROBERTSON 3-18	65 000	SF	1.-	.025		65 000				1625	
	STRUCT'L STL- AT IN-CELLS, S.S.	85	TN	1000	21.-		85 000				1785	
	- MECH. SUPPT AREA	185		1000	21.-		185 000				3885	
	MISC. STEEL											
	- STAIRS, 3" W. W/ HANDRAIL, GALV	6400	RIS	60.-	.70		384 000				4 480	
	- " LANDING, 3" W	6000	SF	4.50	.20		27 000				1 200	
	- EQPT. PLATFORM / SUPPORT	400	TN	1000-	21.-		400 000				8 400	
	- LADDERS W/ CAGES	12	TN	900.	35.-		10 800				420	
	- GRATING	100	TN	1280	12.-		128 000				1200	
	S.S. LINER PLATES						(INCLUDED IN SPECIAL CONST.)					
	PIPE PENETRATION, S.S. ON CELL WALLS						(" IN CONC. WORK)					
	TOTAL, METALS						1 284 800				22 995	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY ZIGGY / AL WEAVER		PRICED BY 4P		DATE JULY '79		SHEET 4 OF 13						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: LW						
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
ACCNT												
3000	MAIN BLDG. -											
	WOOD and PLASTICS											
	RO-CARPENTRY - MISC. BLK'G, ETC	5000	BF	1.-	.10		5 000			500		
	WORK BENCHES	500	LF	80	1.5		40 000			750		
	TOTAL, WOOD						45 000			1250		
	MOISTURE PROTECTION											
	ROOFING - BUILT UP	2750	SQ	50.-	2.-		137 500			5500		
	- ELASTOMERIC	400	/	100.-	5.-		40 000			2 000		
	METAL SIDINGS - SANDWICH PANEL	12 300	SF	3.-	.16		36 900			1968		
	INSULATIONS - RIGID, ROOF 6" TK	120 000	SF	1.20	.02		144 000			2 400		
	3" /	65 000	/	.70	.012		45 500			780		
	- BATT, FIBERGLASS 6" /	151 000	/	.20	.006		30 200			906		
	- VAPOR BARRIER	151 000	/	.05	.003		7 600			453		
	WATERPROOFING - MEMBRANE	38 000	/	.20	.03		7 600			1 140		
	- CELOTEX BD 1/2" TK	38 000	/	.35	.005		13 300			190		
	SHEET METAL - PARAPET CAP GALV	3 500	LF	2.00	.07		7 000			245		
	- REGLET / FLASHING "	4 500	/	2.50	.09		11 300			405		
	ROOF DRAIN 4" Ø	210	EA	100.-	4.-		21 000			840		
	SCUPPER 4" Ø	210	/	50	4.-		10 500			840		
	ROOF HATCHES 30" x 30" GALV	10	/	200.-	4.-		2 000			40		
							514 400			17 707		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY 2.2 / AL WEAVER		PRICED BY 4P		DATE JULY '79		SHEET 5 OF 13						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE - CONCEPT		CKD BY: DL						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT	3000	MAIN BLDG.										
DOORS and WINDOWS												
WINDOWS, STL FRM, PROJECTED OUT W/ SCREEN (2°-5°) ELEC. OP.		7700	9F	7.-	.25		53 900				1925	
DOORS W/ FRM, CLOSER and HARDWARE												
S.G. WOOD W/ HM FRM 1 3/4 3°-7°		100	EA	350.-	4-		35 000				400	
H.M. DOOR / / /		100	EA	400.-	4.-		40 000				400	
/ / / / / 6°-7°		25	EA	700.	8-		17 500				200	
ROLL-UP DOORS, MOTOR OP, STEEL												
10° x 18°		20	EA	1600	25		32 000				500	
20° x 20°		8	EA	2700	36		21 600				288	
SHIELDED and BLAST PROOF DOORS							(INCLUDED IN SPECIAL CONST.)					
TOTAL , DOORS / WINDOWS							200 000				3 713	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY Z.Z. AL WEAVER		PRICED BY 4P		DATE JUL 79		SHEET 6 OF 13						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: <i>AL</i>						
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HFS	DOLLARS	M/HR\$	DOLLARS	
ACCNT												
3000	MAIN BLDG.											
	<u>FINISHES</u>											
	METAL STUDS 6" TK	274 300	SF	.48	.022		131 700				6 035	
	4" /	17 325	SF	.38	.02		6 600				347	
	CEMENT PLASTER W/ MTL LATH-WALL	17 025	SY	5.-	.72		85 100				12 258	
	GYPSUM BOARD 5/8" TK	17 550	SF	.16	.01		2 800				176	
	CEILING - SUSPENSION SYSTEM ONLY	25 800	SF	.31	.04		8 000				1 032	
	- CEM. PL. W/ MTL LATH	1700	GY	5.-	1.-		8 500				1700	
	- ACOUSTICAL TILE	10 500	SF	.60	.016		6 300				168	
	RESILIENT FLR'G - V A TILES	16 800	SF	1.-	.015		16 800				252	
	- TOP SET BASE	3 100	UF	.25	.03		800				93	
	CARPETING	120	GY	7.-	.20		900				24	
	CERAMIC TILE - FLOORS	3 200	SF	2.-	.01		6 400				32	
	- WALLS	6 000	SF	2.-	.01		12 000				60	
	VINYL WALL COVERING	4 100	SF	.50	.02		2 100				82	
	PAINTING - AMERCOAT - HEAVY	791 000	SF	1.36	.05		1 075 800				39 550	
	PAINTING - LIGHT	791 000	'	.22	.03		174 000				23 730	
	- ARCH'L - INTERIOR	407 700	SF	.10	.022		40 700				8 969	
	- EXTERIOR	85 000	SF	.10	.022		8 500				1 870	
	- DOORS / FRM	225	EA	20.	2.-		4 500				450	
	TOTAL, FINISHES						1 591 500				96 828	

ESTIMATE WORKSHEET

M.T.O. BY 2.2 AL WEAVER		PRICED BY 4P		DATE		SHEET 8 OF 13						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE:		CKD BY: AC						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
3000	MAIN BLDG.											
	EQUIPMENT											
	LAB. COUNTER TOP S.S. W/											
	BASE CAB											
	S.S. SINK											
	FUME HOODS, S.S. W/ BASE CAB. ETC											
	96" H x 72" L x 36" D											
	STORAGE BOXES, METAL											
	8' x 6' x 8' H											
	TOTAL, EQUIPMENT											

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

8

M.T.O. BY		ZIGGY Z / DOUGHERTY		PRICED BY		4P / DOUGHERTY		DATE		JUL '79		SHEET		9		OF		13	
JOB NO.:		5872-1		CLIENT:		DOE		TYPE OF ESTIMATE:		PRE CONCEPTUAL		CKD BY:							
UNIT/AREA		OAKRIDGE NATIONAL LAB.		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT			LABOR			TOTAL DOLLARS			
DESCRIPTION		EEP - WTF				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS						
CAPACITY																			
ACCNT																			
3000	MAIN BLDG. -																		
SPECIAL CONSTRUCTION																			
ACCESS FLOOR SYSTEM		2400	SF	7.2	.06			16 800					144						
TORNADO PROOF DOORS																			
- SAME AS FAST PROJECT																			
- TORQUE LIMITER OPERATOR																			
- INCLUDES ALL HARDWARE																			
- 3' 7" SINGLE		30	EA	-	-			(SAME AS SHIELDED DOORS				BELOW)							
- 20' x 20' DOUBLE		4	EA	200 000	200			800 000					800						
SHIELDED WINDOWS		35	EA	75000	200			2 625 000					7000						
TELESCOPING DOORS @ CRANE MAINT.		2	EA	215000	950			430 000					1900						
SHIELDED DOOR, PERSONNEL		30	EA	36 700	35			1 101 000					1050						
P-T CASK		25	EA	232 000	135			5 800 000					3375						
SHIPPING CASK - 25 DIFF. CASK		1	LOT					110 000					500						
MANIPULATOR - P&R 3000		11	EA	110 000	500			1 210 000					5500						
- MODEL G		25	PR	30 000	150			750 000					3750						

ESTIMATE WORKSHEET

M.T.O. BY DOUGHERTY		PRICED BY DOUGHERTY		DATE JULY '79		SHEET 10 OF 13	
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: [Signature]	

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

10

M.T.O. BY ZIGGY Z		PRICED BY 4P		DATE JUL '79		SHEET 11 OF 13					
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE CONCEPT		CKD BY: AC					
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS	
ACCNT											
3000	MAIN BLDG.										
	CONVEYING SYSTEM										
	PASSENGER ELEVATOR - GEARED TYPE	1	EA				100 000	S/C	*		
	PLATFORM SIZE										
	CAPACITY										
	TRAVEL										
	STOPS										
	SPEED										
	SERVICE ELEVATOR - GEARED TYPE	1	EA				125 000	S/C	*		
	PLATFORM SIZE										
	CAPACITY										
	TRAVEL										
	STOPS										
	SPEED										
	FREIGHT ELEVATOR - GEARED TYPE	—	EA				—				
	PLATFORM SIZE										
	CAPACITY										
	TRAVEL										
	STOPS										
	SPEEDS										
*	ABOVE S/C AMT FURNISHED BY OTIS	ELEV.	CO.								

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

11

M.T.O. BY DOUGHERTY		PRICED BY DOUGHERTY		DATE JULY '79		SHEET 12 OF 13						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: [initials]						
UNIT/AREA OAKRIDGE NATIONAL LAB		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LABS		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCENT												
3000 MAIN BUILDING												
CONVEYING SYSTEM - (CONT'D)												
MONORAILS 2 TON - PROCESS AREA		1	EA	5700	200		5700			200		
- MAINT. "		1	EA	5700	200		5700			200		
10 TON		3	EA	15000	250		45000			750		⊕
CRANES 5 TON		5	EA	45300	250		226500			1250		
135 "		1	EA	736500	1200		736500			1200		
25 " - 60' SPAN		1	EA	130000	700		130000			700		⊕
- 36' SPAN		4	EA	320000	700		1280000			2800		⊕
30 TON - " "		-	EA	326300	700		-			-		
⊕ MAT'L UNIT COST USED - DOUGHERTY'S ESTIMATE												
OTHERS USE FAST EST. (7-20-78) + 10%												
MHR " " " "												
TOTAL, CONVEYING SYSTEM							2654400			7100		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

4/12

M.T.O. BY		PRICED BY 4P		DATE JUL '79		SHEET 13 OF 13						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: [Signature]						
UNIT/AREA OAKRIDGE NATIONAL LAB.		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCENT												
3000 MAIN BLDG. -												
PLUMBING												
WATER CLOSETS 130												
URINALS 100		400	EA	600	20		240,000			8,000		
LAVATORIES 130												
STAINLESS STL LAB. SINK - 20												
ELEC. WATER COOLER - ALLOW 20												

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>MG MERREDO</u>		PRICED BY <u>MGM/WDC</u>		DATE <u>6-19-79</u>		SHEET <u>1</u> OF <u>10</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AC</u>						
UNIT/AREA <u>PPD - WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>HVAC</u>												
<u>OUTDOOR AIR SUPPLY SYSTEM</u>												
• PLENUM - CONSISTING OF PF, HEF, STM COILS & COOLING COILS. 42333 CF CAPACITY, GALV. HOUSING. SC III		3	EA	2100	60.		63000				180	
• FANS - CENTRIFUGAL WITH VIV, 63500 CF CAP. AT 10" S.P. 125 HP MOTOR. SC III		3	EA	1900	55.		57000				165	
<u>RECIRCULATING AIR SYSTEM</u>												
• PLENUM - CONSISTING OF 2-STAGES OF HEPA FILTERS AND COOLING COIL, CARBON STEEL HOUSING, MIN 7 GA. WALK-IN TYPE WITH A CAP. OF 31533 CF. SC II		3	EA	11000	180		330000				240	
• FANS - CENTRIFUGAL WITH VIV 47300 CF CAP AT 10" SP, 75 HP MOTOR		3	EA	1700	40.		51000				120	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>M.G. MERCADO</u>		PRICED BY <u>MGM/WDC</u>		DATE <u>6-19-79</u>		SHEET <u>2</u> OF <u>10</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>MC</u>						
UNIT/AREA <u>FFP - WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>HVAC</u>												
<u>FINAL FILTRATION SYSTEM</u>												
• PLENUM - F.W. DELUGE & 3-STAGE HEPA FILTERS BAG-IN - BAG-OUT TYPE, WITH PROVISIONS FOR IN-PLACE TESTING, 25940 CF CAP. S.S. HOUSING, SC I		5	EA	104000	90.		520000			450		
• FANS - CENTRIFUGAL WITH VIB. 48850 CF CAP. AT 14" SP. 150 HP. MOTOR S.C. I		3	EA	24000	50.		72000			150		
• DEEP BED GLASS FIBER FILTERS * 3 BAYS, 20 FT DEEP. S.S. LINER 3/16" TK PLATE ALL WELDED CONSTRUCTION INCL. FILT. HOLDING FRAMES. 11000 FT ² (7.65 #/ft ²) 1/2		101000	LB	266	.20		268660			20200		
* DBCF 0.7 #/FT ³ SIZE 2'x4' 15" DEEP 130000 CF @ 50 FPM VEL. 4-STAGES. S.S. FILTER FRAMES WITH S.S. WIRE MESH.		1300	EA	200	1.3		260000			1690		
* WATER SPRAY - 400 HEADS DELUGE SYSTEM, ALL S.S. CONSTRUCTION		1	LS.				24000			1200		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF							
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY									
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS		
DESCRIPTION				MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS					
CAPACITY															
ACCNT															
HVAC.															
IN-CELL PRE-FILTRATION - S.S. WIRE GRID OR MESH, WEDGE TYPE FILTERS FOR REMOTE SERVICE BY MANI- PULATOR. FILTER CAP. 32000¢ (5100 + 72000 = 123200¢)		62	EA	300	2.		18600					124			
CONTROL DAMPERS WITH AIR OPERATORS AVERAGE OF 30¢		40	EA	3500	30.		140000				1200				
HVAC CONTROLS - PNEUMATIC & ELECTRIC CONTRAS TO INCLUDE • FLOW MONITORS • PRESS. CONTROLLERS • TEMP. CONTROLLERS • PNEUMATIC TUBING. (24) • TESTING, ETC.		1	LS	-	-		150000				2000				
WATER COOLING COILS - 6 ROWS EACH APPROX. 24 FT ² .		10	EA	1800	20.		18000				200				
STM. REHEAT COILS - 4 ROWS EACH APPROX 20 FT ² .		15	EA	1500	15.		22500				225				

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
	HVAC											
	DUCTWORK —											
	• GALV. STEEL SHEET METAL 160,000 G @ 1#/G (1.2)	192000	LB	.97	.07		186240				13440	
	• S.S. DUCTWORK ALL WELDED CONSTRUCTION 16 GA. MIN. 130,000 G @ 1.5#/G (1.2)(1/3)	80000	LB	3.20	.10		256000				8000	
	QUANTITY ABOVE INCLUDES BDD'S, VOL. DAMPERS, & SCRAP.											
	• DUCT INSULATION — RIGID TYPE MIN. 1 1/2" THICK PROVIDE IN SUPPLY ONLY	40000	SF	1.33	.063		53200				2520	
	FILTERS —											
	• ZONE RETURN FILTERS 6" TK. MED. EFFICIENCY 1000 G CAPACITY EACH	90	EA	100	.50		9000				45	
	• INITIAL TEST AND REPLACEMENT FILTERS.											
	RF 75+90	165	EA	.50	.50		8250					
	HEF	75	EA	.50	.50		11250				408	
	HEPA	250	EA	2.00	.50		50000					
	DBGF	325	EA	2.00	.50		65000					

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>M.G. MORALES</u>		PRICED BY <u>MGM/WDC</u>		DATE <u>6-19-79</u>		SHEET <u>5</u> OF <u>10</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AC</u>						
UNIT/AREA <u>FPP-WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
	<u>HVAC</u>											
	<u>EXHAUST FILTRATION SYSTEM</u> <u>ZONE II:</u>											
	• PLENUM - CONSISTING OF WATER SPRAY DELUGE SYSTEM, 3 STAGES OF HEPA, CARBON STEEL HOUSING TGA, WALK-IN TYPE WITH A CAP OF 36300 CF EA. SC II.	2	EA	14000	90.		280000				180	
	• FANS - CENTRIFUGAL WITH VIV, 29300 CF CAP @ 10" SP, 75 HP. SC II	12	EA	19000	40.		38000				30	
	MACH. EQUIPT. P.H. FANS - COMPONENT, PF, COOLING COIL FAN SECTION, VERTICAL DRAW-THRU, 4000 CF AT 1" C.P. 5 HP MOTOR.	12	EA	3500	16		42000				192	
	BOILER ROOM VENT. - 10000 CF CAP. @ 1" SP. 10 HP MOTOR	4	EA	2500	40		10000				160	
	UNIT HEATER (STM.) 80000 BTUH CAP. 1/4 HP MOTOR.	4	EA	750	10.		3000				40	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF							
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY									
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS		
DESCRIPTION				MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS					
CAPACITY															
ACCNT															
FFP-WTF															
HVAC.															
BAT. RM/UPS EXH. FAN —		1	EA.	2000	12.		2000					12			
4000 CF @ 1.5" S.P.															
3 HP MOTOR															
UTILITY EQUIP. ROOM —		1	EA.	12000	40.		12000					40			
• HEATING & VENTL. UNIT															
WITH P.F. & STM. HEATING															
COIL 40000 CF @ 2" S.P.															
30 HP MOTOR SC-I															
• ODA PURGE UNIT WITH		1	EA.	5000	30.		5000					30			
P.F. HEATING COIL (20 KW)															
1000 CF CAP. @ 2" W.G.															
S.P. SC-I															
HEAT RECOVERY SYSTEM —															
• PUMP & MOTOR — 400 GPM		1	EA.	2500	15.		2500					15			
@ 70 FT. HEAD. 10 HP															
• HEAT RECOVERY COILS		2	EA.	3000	40.		6000					80			
APPROX. 60 A															
STM. UNIT HEATER —															
60000 BTUH. 1/4 HP MOTOR		8	EA.	600	10		4800					80			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
	HVAC											
	FACILITY CONTROL/COMP. ROOMS.											
	• AIR HANDLING UNITS - 30000 G CAPACITY AT 4.4 S.P. COMPONENTS TO INCLUDE: P.F. H.B.F. COOLING COIL (W/L/DX) STM. HTG. COIL FAN WITH VIV & OPERATOR S.C.I.	2	EA	1500	100.		30000				200	
	• AIR COOLED CONDENSING UNIT - 50 TON CAPACITY S.C.I.	1	EA	16000	30.		16000				30	
	• RETURN/EXHAUST FAN 25000 G CAP. AT 3" S.P. 30 HP MOTOR. PROVIDE VIV & OPERATOR	2	EA	7000	30.		14000				60	
	• LOCKER/TOILET EXH. FAN 5000 G CAP. @ 1" S.P. 3 HP MOTOR	1	EA	2000	12		2000				12	
	• DUCTWORK SHEETMETAL (GALV.)	32000	lbs	.97	.07		31040				2240	
	DUCT INSULATION	8000	FT ²	1.33	.063		10640				504	
	• STEAM HUMIDIFIER	1	EA	600	8.		600				8	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET						
M. G. MERCADO		MGM/WOC		6-19-79		8 OF 10						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
5872-1		DOE		CONCEPTUAL		H. H. H.						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
	HVAC											
	• ELECTRIC REHEAT COILS WITH CONTACTORS, SCR, & LOCAL CONTROL PANEL. 10 KW											
	10	EA	1500	8.		15000			80			
	BALANCING & TESTING OF HVAC SYSTEM FOR FFP.											
	1	LS	-	-		-			400			
	HVAC PIPING:											
	CHILLED WATER & STEAM											
	1	LS				50000			1600			
	SUB TOTAL HVAC											
	PRODUCTIVITY @ 65%											
	TOTAL HVAC											
						3 253280			58600			
									31554			
						3 253300			90154			

OFFICE, GUARD HOUSE
(3000)

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

CES-4903-0

DATE JUL 79SHEET 1 OF 6MTO BY ZIGGY
PRICED BY 4PJOB NO.: 5872-1CLIENT: DOETYPE OF ESTIMATE: PRE-CONCEPT

CHECKED BY:

PROJECT: <u>OAKRIDGE NATIONAL LAB - WTF</u>		Qty	Unit	Cost/Unit			Materials & Expense	Subcontract		Labor		Total Dollars
Acct. No.	BUILDINGS OFFICE / GUARD HOUSE			Matl	Hr	Labor \$		Hours	Dollars	Hours	Dollars	
3000	SUMMARY : FFP TOTAL AREA	19 864	SF									
	EARTHWORK						(INCLUDED	W/	MAIN	BLDG.)		
	CONCRETE WORK						82 000			6 994		
	MASONRY						21 400			2 546		
	METALS						70 700			1 423		
	WOOD and PLASTICS						18 100			310		
	MOISTURE PROTECTION						33 400			989		
	DOORS and WINDOWS						46 400			1 080		
	FINISHES						46 400			2 013		
	BLDG. SPECIALTIES						19 200			226		
	EQUIPMENT											
	SPECIAL CONSTRUCTION											
	CONVEYING SYSTEM											
	MECHANICAL - PLUMBING						39 000			1 300		
	- FIRE PROTECTION						13 900			795		
	- H V A C						69 500			3 972		
	SUB TOTAL						460 000			21 648		
	PROD. 80 %									5 412		
	SUB-TOTAL					14.68	460 000			27 060	397 200	
	ELECTRICAL					(EXCLUDED IN THIS ACCT)						
	TOTAL, OFFICE / GUARD HSE.						460 000			397 200	857 200	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HFS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCNT												
3000	A - OFFICE and GUARD HOUSE	19864	SF	(74' x 266')								
<u>CONCRETE WORK</u>												
	FOOTING, CONTINUOUS - EXC. INCL.	50	CY	65.-	3.7		3 250			185		
	SLAB ON GRADE - EXC. INCL	250	CY	61.-	5.0		15 250			1250		
	WALLS	192	CY	97.-	15.5		18 620			2976		
	ROOF SLAB 2" TK	123	CY	95.	7.5		11 680			923		
	615											
	REBAR 615 CY @ 270 #	83	TM	400.	20.		33 200			1660		
	TOTAL, CONCRETE	615	CY	133	11.31		82 000			6994		
<u>MASONRY</u>												
	CONC. BLK. WALL, 12" TK, CELLS FILLED	4100	SF	1.50	.13		6 150			532		
	FACE BRICK, 4" TK	6100	SF	2.50	.33		15 250			2013		
	TOTAL, MASONRY	10 200	SF	2.10	.25		21 400			2546		

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCNT												
3000	A - OFFICE and GUARD HOUSE											
	<u>METALS</u>											
	OPEN WEB STEEL JOIST											
	24 LH 09 X 40' LONG	30	TN	600	12.-		18 000			360		
	STRUCTURAL STEEL	20	TN	1000	21.-		20 000			420		
	METAL DECKING, ROBERTSON 3-18	19 700	SF	1.00	.025		19 700			493		
	MISC. METAL	10	TN	1300	15.-		13 000			150		
	TOTAL, METALS						70 700			1423		
	<u>CARPENTRY</u>											
	ROUGH CARPENTRY, P-TREATED	100	BF	1.00	.10		100			10		
	FINISH CARP- SHELVES, WORKBENCH ETC	500	SF	20	.30		10 000			150		
	CABINETS, BASE and WALL	100	LF	80-	1.5		8 000			150		
	TOTAL, CARPENTRY						18 100			310		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY ZIGGY Z		PRICED BY 4P		DATE JUL 79		SHEET 4 OF 6						
JOB NO.: 5272-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: AL						
UNIT/AREA OAKRIDGE NATIONAL LAB.		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
3000	A - OFFICE and GUARD HOUSE											
	MOISTURE PROTECTION											
	VAPOR BARRIER	40 700	SF	.05	.003		2 040				122	
	BUILT-UP ROOFING	210	SQ	50.-	2.-		10 500				420	
	FLASHING, ETC	1000	SF	2.50	.09		2 500				90	
	GUTTERS and DOWNSPOUT	800	LF	2.-	.07		1 600				56	
	INSULATION - RIGID. ROOF 3" TK	21 000	SF	.70	.012		14 700				252	
	WALL 2" TK	4 100	SF	.50	.012		2 050				49	
	TOTAL, MOISTURE PROTECTION						33 400				989	
	DOORS and WINDOW - (HARD, INCL.)											
	ALUM. STOREFRONT	4400	SF	6.-	.20		26 400				880	
	H.M. DOORS and FRM 1 3/4 x 3'-7"	50	EA	400	4.-		20 000				200	
	TOTAL - DOORS / WINDOWS						46 400				1080	
	FINISHES											
	CARPETS n.l. 4'	175	SY	7.-	.20		1 230				35	
	METAL STUDS 4" W/ GYP BD EA SIDE	9 000	SF	0.50	0.05		4 500				450	
	CERAMIC TILE - FLR and WALL	3800	SF	2.-	0.01		7 600				38	
	ACOUSTICAL TILE ON EXPOSED SUSP.											
	GRID - 2' x 4' x 1"	20 000	SF	0.03	.03		12 000				600	
	RESILIENT FLR - VAT	17 300	SF	1.-	.015		17 300				260	
	- BASE	3 000	LF	0.25	.03		750				90	
	PAINTING, WALLS - GYP BD and CMU	20 000	SF	0.10	.022		2 000				440	
	- DOORS / FRM	50	EA	20-	2.0		1 000				100	
	TOTAL, FINISHES						46 400				2013	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY ZIGGY Z.		PRICED BY 4P		DATE JUL 79		SHEET 5 OF 6						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: [Signature]						
UNIT/AREA OAKRIDGE NATIONAL LAB		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
3000	A - OFFICE and GUARD HOUSE											
	<u>BUILDING SPECIALTIES</u>											
	TOILET PARTITION, BAKED ENAMEL											
	CEILING HUNG, METAL	30	EA	350	3.5		10 500			105		
	URINAL SCREEN	6	EA	120	1.6		720			10		
	MIRRORS - 24" x 24" w/ S.S. FRM	15	EA	30	.40		450			6		
	DRINKING FOUNTAIN, SS, SURF. MTD.	4	EA	600	2.0		(INCLUDED IN PLUMBING)					
	PERSONAL TURNSTILE 5" Ø ELEC.	2	EA	1100	27		2 200			54		
	LOCKERS, SINGLE TIER 15" x 24" x 72"	14	EA	70	.7		980			10		
	<u>TOILET ACCESSORIES:</u>											
	PAPER HOLDER S.S.	30	EA	10-	.27		30			8		
	SEAT COVER HOLDER /	30	/	30	.50		900			15		
	SOAP DISPENSER /	15	/	25	.40		380			6		
	TOWEL DISP and WASTE DISP.	15	/	200	.80		3 000			12		
	<u>TOTAL, BLDG. SPECIALTIES</u>						19 200			226		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:								
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$	M/HR\$	DOLLARS	M/HR\$	DOLLARS				
CAPACITY														
ACCT														
3000 A - OFFICE and GUARD HOUSE														
<u>MECHANICAL</u>														
<u>PLUMBING - (FIXTURES and RO-INS)</u>														
- WATER CLOSET		30	EA											
- URINAL		6												
- LAVATORIES		15												
- DRINKING FOUNTAIN (RO-INS)		4												
- FLOOR DRAINS		10												
		65	EA	600	20		39 000				1300			
<u>FIRE PROTECTION</u>														
SPRINKLER SYSTEM, CONCEALED		19 864	SF	.70	.04		13 900				795			
<u>H V A C</u>		19 864	SF	3.5	.20		69 500				3 972			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

CES-4903-0

DATE JUL '79SHEET 1 OF 3MTO BY _____
PRICED BY _____JOB NO.: 5872-1 CLIENT: DOETYPE OF ESTIMATE: PRE - CONCEPTCHECKED BY: ØPROJECT: OAKRIDGE NATIONAL LAB. - TENN.

Acct. No.

FFP-WTF

Qty

Unit

Cost/Unit

Matl

Hr

Labor
\$Materials
&
Expense

Subcontract

Hours

Dollars

Labor

Hours

Dollars

Total
Dollars

5000

OTHER STRUCTURES - SUMMARY

CONCRETE WORK

958 800

115 292

MOISTURE PROTECTION

27 700

1 760

PAINTING

8 800

1 265

SPECIAL CONSTRUCTION

400 000

400

SUB-TOTAL
PRODUCTIVITY

80

%

118 717
29 679

TOTAL, 5000 - FFP

13.46

1 395 300

148 396

1 997 400

3 392 700

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>J.Z. AL WEAVER</u>		PRICED BY <u>4P</u>		DATE <u>JUL '79</u>		SHEET <u>2</u> OF <u>3</u>										
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>PRE-CONCEPT</u>		CKD BY: <u>LYN</u>										
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT			LABOR			TOTAL DOLLARS		
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS					
ACCNT																
5000	OTHER STRUCTURES															
	CONCRETE WORK															
	EXHAUST AIR - CONC. - STACK	921	CY	133.	27		122	500				24	867			
	- TUNNEL	1507	/	198.-	30		298	400				45	210			
	- EXCAVATION	10185	/	-	.10		-					10	19			
	- EARTH BACKFILL	3963	/	-	.10		-					6	34			
	- GRAVEL "	3000	/	9.-	.20		27	000				6	00			
	- 6"φ V.C. PIPE	2140	LF	2	.12		4	300				2	57			
		2428	CY													
	- REBAR 2428 @ 270 #	328	TM	400.	20.		131	200				6	500			
	TRANSFER TERMINAL															
	- WALLS	569	CY	97.-	13.5		55	200				7	681			
	- SLAB ON GRADE	88	/	61.-	5.-		5	400				4	40			
	- SUSPENDED SLAB	88	/	60.-	5.-		5	800				4	40			
		745	/													
	- REBAR 745 @ 270 #	100	TM	400	20		40	000				2	000			
	WATER TOWER	1200	CY	97.-	13.5		116	400				16	200			
	UTILITY TANK WALLS	44	/	97.-	13.5		4	300				5	94			
	TANK PADS - EARTH WORK INCL.	621	/	61.-	5.-		37	900				3	105			
	COOLING TOWER BASE	85		61.-	5.-		5	200				4	25			
		1950	CY													
	REBAR 1950 @ 270 #	263	TM	400	20.		105	200				5	260			
	TOTAL, CONCRETE	5123	CY	187.-	22.50		958	800				115	292			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE		SHEET _____ OF _____									
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY:									
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS			
DESCRIPTION	MATL			M/H	LAB \$	M/HR\$		DOLLARS	M/HR\$	DOLLARS					
CAPACITY															
ACCNT															
5000 OTHER STRUCTURES															
2800 Mock-UP FACILITY EQUIPMENT							9550000			94879	1575000	11125000			
4900 Mock-UP FACILITY BUILDING							1412000			75703	1112000	2524000			
(COSTS OF 2Q77 JOB 5686-1, HTGR FUEL RECYCLE COMMERCIALIZATION ESTIMATE ESCALATED TO 3Q79)															
PRODUCTIVITY INCLUDED															
TOTAL							10962000			170582	2687000	13649000			

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF										
JOB NO.		CLIENT:		TYPE OF ESTIMATE:		CKD BY:												
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			SUBCONTRACT			LABOR			TOTAL DOLLARS					
DESCRIPTION				MATL	M/H	LAB \$	EXPENSE			M/HRS	DOLLARS	M/HRS	DOLLARS					
CAPACITY																		
ACCNT																		
6000 SPECIAL FACILITIES-EQUIPMENT SUMMARY																		
SK-MP-1							1	827	100			3131	52	000	1	879	100	
" 2							1	808	000			3115	51	700	1	859	700	
" 3							1	326	800			2592	43	000	1	369	800	
" 4							2	671	300			4892	81	200	2	752	500	
" 5								871	300			2123	35	200		906	500	
" 6								923	600			3023	50	200		973	800	
" 7							2	083	900			3831	63	600	2	147	500	
" 40, 40A, 40-1							5	658	200			80123	1	330	000	6	988	200
TOTAL EQUIPMENT WTF-FFP							17	170	200			102984	1	706	900	18	877	100
NOTE: THIS IS A SUMMARY OF EQUIPMENT REQUIREMENTS FOR ALL FFP-WTF PROCESSES AND SERVICE UTILITIES.																		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE <u>7-20-79</u>				SHEET <u> </u> OF <u> </u>				
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>				CKD BY: <u>LW</u>				
UNIT/AREA <u>SK-MP-1</u>		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCNT												
6000	SPECIAL FACILITIES-EQUIPMENT SUMMARY											
1100	COLUMNS						331800			400		
1200	VESSELS						1370900			820		
1300	HEAT EXCHANGERS						26800			90		
1500	PUMPS						47800			505		
2200	SEPARATION EQUIPMENT						600			20		
2400	AGITATORS, MIXERS						4300			100		
2300	CONCENTRATION EQUIPMENT						44900			100		
	SUBTOTAL									2035		
	65% PRODUCTIVITY-(2035/.65)-2035									1096		
	TOTAL FOR SK-MP-1	3131	MH		16.60		1827100			3131	52000	1879100

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY <u>BW</u>		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT:		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u> </u>						
UNIT/AREA <u>SK-MP-1</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>1100</u>												
<u>COLUMNS</u>												
<u>FFP-WTF-COL 1-1A THRU COL 1-1E,</u>		<u>5</u>	<u>EA</u>	<u>4000</u>	<u>20</u>		<u>20000</u>			<u>100</u>		
<u>400#EA@10=\$4000EA</u>												
<u>304L OR 316L STAINLESS STEEL</u>												
<u>CEC COLUMN, 8"-SCH 160S</u>												
<u>PIPE 39" LONG T-T WITH 10"</u>												
<u>SCH 10S PIPE JACKET, SHELL</u>												
<u>DESIGN- 1750 PSIG @ 200°F.;</u>												
<u>JACKET- 100 PSIG @ 200°F.</u>												
<u>COLUMNS FILLED WITH ION-</u>												
<u>EXCHANGE RESIN. ASME</u>												
<u>CODE STAMPED.</u>												
<u>Q.A. LEVEL I</u>												
<u>COL 2-1A THRU 6"-8" AS ABOVE 275#EA</u>		<u>5</u>	<u>EA</u>	<u>3300</u>	<u>20</u>		<u>16500</u>			<u>100</u>		
<u>275#x12=\$3300EA</u>												
<u>FFP-WTF-COL 3-1A THRU</u>		<u>5</u>	<u>EA</u>	<u>2400</u>	<u>20</u>		<u>12000</u>			<u>100</u>		
<u>COL 3-1E</u>												
<u>160#EA@15</u>												
<u>304L OR 316L STAINLESS STEEL</u>												
<u>CEC COLUMN, 3" SCH 160S</u>												
<u>PIPE 6.3" LONG T-T WITH 4"</u>												
<u>SCH 10S PIPE JACKET, SHELL</u>												
<u>DESIGN- 1750 PSIG @ 200°F.;</u>												
<u>JACKET 100 PSIG @ 200°F.</u>												
<u>ASME CODE STAMPED. COLUMNS</u>												
<u>FILLED WITH ION-EXCHANGE</u>												
<u>RESIN.</u>												
<u>ION EXCHANGE RESIN FOR ABOVE</u>		<u>20</u>	<u>CF</u>	<u>600</u>	<u>5</u>		<u>12000</u>			<u>100</u>		
<u>Q.A. LEVEL I</u>		<u>48500</u>	<u>\$</u>	<u>.15</u>			<u>7300</u>					
<u>TOTAL</u>							<u>67800</u>			<u>400</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>ME</u>						
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
ACCNT												
1200	VESSELS											
	FFP-WTF-TK3-1											
	100L 1/8" TI CLAD 3/8" THK 304L OR 316L SS BOX TYPE 3'-3" x 3'-6" HIGH x 4" WIDE INSIDE W/15LF 1" SCH 80 TI COOLING COIL + 1/2" TI STIFFENERS ON 12" GRID	600	LB	50			30 000			30		
	QA LEVEL I	30 000	\$	.15			4 500					
	GRAYLOC HUBS - 1/2"	5	EA	2000			10 000					
	1"	5	EA	2200			11 000					
	1 1/2"	3	EA	2800			8 400					
	FFP-WTF - TK4-1											
	570L SAME AS ABOVE EXCEPT	2400	LB	35			84 000			40		
	8'-0" x 7'-3" HI W/75' COIL - 3/4" SPARGES 2											
	QA LEVEL I	84 000	\$	.15			12 600					
	GRAYLOC HUBS - 1/2"	7	EA	2000			14 000					
	1"	2	EA	2200			4 400					
	1 1/2"	5	EA	2800			14 000					
	TOTAL						192 900			70		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE		SHEET ____ OF ____						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY:						
UNIT/AREA <u>SK-MP-1</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1200 VESSELS</u>												
<u>FFP-WTF-TK31-1</u>		<u>3200</u>	<u>LB</u>	<u>8</u>			<u>25600</u>			<u>30</u>		
<u>1500L 304L OR 316L 15PSIG CODE STAMP</u> <u>FULL XR, 2" COILS, 42" Ø x 72" T-T VERT</u>												
<u>FFP-WTF-TK-16-1</u>		<u>1500</u>	<u>LB</u>	<u>8</u>			<u>12000</u>			<u>20</u>		
<u>625L 304L OR 316L 15PSIG CODE STAMP</u> <u>FULL XR, 1" COILS, 36" Ø x 40" T-T VERT</u>												
<u>FFP-WTF-TK33-1+17-1</u>		<u>2</u>	<u>EA</u>		<u>20</u>					<u>40</u>		
<u>950L EA 304L OR 316L 15PSIG CODE STAMP</u> <u>FULL XR, 1" COILS, 36" Ø x 3'-9" T-T VERT</u>		<u>3600</u>	<u>LB</u>	<u>8</u>			<u>28800</u>					
<u>FFP-WTF-TK 18-1, 19-1, 34-1 + 35-1</u>		<u>4</u>	<u>EA</u>		<u>45</u>					<u>180</u>		
<u>6000L EA 304L OR 316L 15PSIG CODE STAMP</u> <u>FULL XR, 2" COILS, 66" Ø x 96" T-T VERT</u>		<u>26800</u>	<u>LB</u>	<u>7</u>			<u>187600</u>					
<u>FFP-WTF-TK-152</u>		<u>1850</u>	<u>LB</u>	<u>8</u>			<u>14800</u>			<u>20</u>		
<u>2150L 304L OR 316L 15PSIG CODE STAMP</u> <u>FULL XR, 3/4" SPRAY, 48" Ø x 65" T-T VERT</u>												
<u>FFP-WTF-TK 32-1</u>		<u>2800</u>	<u>LB</u>	<u>10</u>			<u>28000</u>			<u>30</u>		
<u>200L 304L OR 316L 1750 PSIG CODE STAMP</u> <u>FULL XR 10" JACKET, 8" Ø SCH 160 x 27'-10" T-T VERT</u> <u>QA LEVEL I - ALL</u>		<u>296800</u>	<u>\$</u>	<u>.15</u>			<u>44600</u>					
<u>TOTAL</u>							<u>371400</u>			<u>320</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE		SHEET <u> </u> OF <u> </u>							
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>42</u>							
UNIT/AREA <u>SK-MP-1</u>		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$	M/HR\$	DOLLARS	M/HR\$	DOLLARS			
CAPACITY													
ACCNT													
<u>1200 VESSELS</u>													
<u>FFP-WTF-TK104,116,118,120,122 & 124</u>		<u>6</u>	<u>EA</u>		<u>20</u>						<u>120</u>		
		<u>960</u>	<u>LB</u>	<u>10</u>			<u>9600</u>						
<u>4 GAL 304L OR 316L 1750 PSIG CODE STAMP</u>													
<u>FULL XR, 8" SCH 160 x 22" T-T VERT</u>													
<u>QA LEVEL</u>		<u>9600</u>	<u>#</u>	<u>.15</u>			<u>1500</u>						
<u>TK-103,106,107,108,109 & 110</u>		<u>6</u>	<u>EA</u>		<u>35</u>						<u>210</u>		
		<u>28800</u>	<u>LB</u>	<u>7</u>			<u>201600</u>						
<u>6000L 304L 15 PSIG CODE STAMP FULL XR</u>													
<u>66" Ø x 96" T-T VERT INCL NOZZLES &</u>													
<u>PIPE COIL</u>													
<u>FFP-WTF-TK-111</u>		<u>4000</u>	<u>LB</u>	<u>7</u>			<u>28000</u>				<u>30</u>		
<u>6000L 304L 15 PSIG CODE STAMP FULL XR</u>													
<u>66" Ø x 96" T-T VERT INCL NOZZLES</u>													
<u>FFP-WTF-TK-145</u>		<u>1725</u>	<u>LB</u>	<u>8</u>			<u>13800</u>				<u>20</u>		
<u>2400L 304L 15 PSIG CODE STAMP FULL XR</u>													
<u>48" Ø x 66" T-T VERT INCL NOZZLES</u>													
<u>FFP-WTF-TK-127</u>		<u>2600</u>	<u>LB</u>	<u>8</u>			<u>20800</u>				<u>30</u>		
<u>6000L 304 OR 316 15 PSIG CODE STAMP</u>													
<u>FULL XR, 66" Ø x 96" T-T VERT INCL NOZZLES</u>													
<u>GRAYLOC HUBS FOR ABOVE - 1/2"</u>		<u>12</u>	<u>EA</u>	<u>1600</u>			<u>19200</u>				<u>INCL.</u>		
<u>TOTAL</u>							<u>294500</u>				<u>410</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE		SHEET _____ OF _____					
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE:		CKD BY: <u>MC</u>					
UNIT/AREA <u>SK-MP-1</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY											
ACCNT											
<u>1200 VESSELS</u>											
<u>GRAYLOC HUBS FOR VESSELS:</u>											
<u>204L + 216L SS</u>											
	<u>1/2"</u>	<u>19</u>	<u>EA</u>	<u>1600</u>		<u>30400</u>				<u>INCL W/ VESSELS</u>	
	<u>1"</u>	<u>20</u>	<u>EA</u>	<u>1700</u>		<u>34000</u>					
	<u>1 1/2"</u>	<u>58</u>	<u>EA</u>	<u>2200</u>		<u>127600</u>					
	<u>2"</u>	<u>48</u>	<u>EA</u>	<u>2900</u>		<u>139200</u>					
	<u>3"</u>	<u>10</u>	<u>EA</u>	<u>4100</u>		<u>41000</u>					
	<u>8"</u>	<u>2</u>	<u>EA</u>	<u>12100</u>		<u>24200</u>					
	<u>12"</u>	<u>6</u>	<u>EA</u>	<u>18600</u>		<u>111600</u>					
<u>TOTAL</u>						<u>508000</u>					
<u>GRAND TOTAL - SK-MP-1 VESSELS</u>						<u>1370900</u>				<u>820</u>	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCNT												
1300	HEAT EXCHANGERS											
	FFP-WTF-HE 12-1	1	EA				3800			30		
	HEAT EXCHANGER, 80,000 BTUH DUTY, 304L OR 316L SHELL AND TUBES, DESIGN PRESSURE: SHELL - 15 PSIG, TUBES - 100 PSIG, SURFACE - 25 SQ.FT. Q.A.-I											
	FFP-WTF-HE 13-1	1	EA				3000			30		
	HEAT EXCHANGER, 14,000 BTUH DUTY, AS ABOVE EXCEPT: SURFACE - 5 SQ.FT. Q.A.-I											
	HE-140, -151	1	EA				16500			30		
	HEAT EXCHANGER, 110,000 BTUH DUTY, AS ABOVE EXCEPT: SURFACE - 110 SQ.FT. Q.A.-I											
	QA LEVEL I	23300	\$	.15			3500					
	TOTAL						26800			90		
	GRAND TOTAL-SK-MP-1 HEAT EXCHANGERS						26800			90		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>Graham</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>KE</u>						
UNIT/AREA <u>SK-MP-1</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1500</u>												
<u>PUMPS.</u>												
<u>FFP-WTF-P-126, -128, -132</u>		<u>4</u>	<u>EA</u>	<u>2000</u>			<u>8000</u>			<u>80</u>		
<u>- 146</u>												
<u>316 STAINLESS POSITIVE DISPLACE-</u>												
<u>MENT ROTARY PUMP, 1-4 GPM</u>												
<u>CAPACITY @ 50 PSIG, WITH 15FT.</u>												
<u>SUCTION LIFT, VARIABLE SPEED</u>												
<u>DRIVE w/ REMOTE SPEED CONTROL,</u>												
<u>SPEED RANGE 50-350 RPM, 3/4</u>												
<u>HP., 460V, 3Φ, 60 HZ TEFC</u>												
<u>MOTOR., MECH. SEALS</u>												
<u>TUTHILL MODEL 8A</u>												
<u>Q. A. LEVEL I</u>												
<u>FFP-WTF-P-130, -139, -134, -135,</u>		<u>7</u>	<u>EA</u>	<u>1500</u>			<u>10500</u>			<u>140</u>		
<u>- 143, -144, -150</u>												
<u>316 STAINLESS POSITIVE DISPLACEMENT</u>												
<u>ROTARY PUMP, 0-1 GPM @</u>												
<u>50 PSIG w/ 15 FT. SUCTION LIFT,</u>												
<u>VARIABLE SPEED DRIVE w/ REMOTE</u>												
<u>SPEED CONTROL, SPEED RANGE</u>												
<u>45-150 RPM, 1/2 HP. 460V, 3Φ,</u>												
<u>60 HZ TEFC MOTOR, MECH. SEALS</u>												
<u>TUTHILL MODEL 4A</u>												
<u>Q. A. LEVEL I</u>		<u>18500</u>	<u>\$</u>	<u>.18</u>			<u>3400</u>					
<u>TOTAL</u>							<u>21900</u>			<u>220</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
2200 SEPARATION EQUIPMENT												
FFP-INTF - F1-1		1	EA	500	20		500				20	
TYPE 316 STAINLESS SINTERED METAL, 5 MICRON RATING, 1 GPM FLOW. WITH 1.0 PSI LOSS, 1/8" THICKNESS, 2 3/4" CYLINDRICAL SHAPE, 2 3/4" DIA X 9 3/4" LONG. FURNISHED WITH STAINLESS STEEL HOUSING.												
AMF CUND TYPE 1B1 HOUSING WITH ELEMENT # 50387. Q.A. I							100					
TOTAL							600				20	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>DC</u>						
UNIT/AREA <u>SK-MP-1</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
2400	AGITATORS, MIXERS											
	FFP-WTF-AG-112,113,-114,-115	4	EA	750	-20		3000			80		
	TOP-ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAINLESS WETTED PARTS, MOTOR IS 1 Hp. 460V, 3Φ, 60Hz TEFC CHEMINEER MODEL VMN-10											
	FFP-WTF-AG-147	1	EA	600	-		600			20		
	TOP ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAINLESS WETTED PARTS, MOTOR IS 3/4 HP, 460V, 3Φ, 60 Hz TEFC. CHEMINEER MODEL VHN-7											
	QA LEVEL I	3600	\$	.18			700					
	TOTAL						4300			100		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.: 5872-1		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LABS		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
2300	CONCENTRATION EQUIP'T.											
	FFP-WTF - CONC 1-1											
		1	EA	25,000			25000			50		
	TITANIUM CLAD 316 STAINLESS STEEL CONCENTRATOR, 6" DIA X 54" COLUMN WITH DISENGAGING SECTION, REBOILER. Q.A. LEVEL I											
		25000	#	.15			3800					
	FFP-WTF - CONC 9-1											
		1	EA	14,000			14000			50		
	VESSEL WT 800LB; HX WT 400LB											
		1200	LB	1.67								
	316 STAINLESS STEEL CONCENTRATOR 8" PIPE COLUMN 108" T-T WITH 12" DIA X 24" DISENGAGING SECTION, REBOILER WITH 15 SQ. FT. SURFACE. DESIGN FOR 100 PSIG @ 350°F. Q.A. LEVEL I											
		14000	#	.15			2100					
	TOTAL											
							44900			100		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE <u>7-20-79</u>				SHEET <u> </u> OF <u> </u>					
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>				CKD BY: <u>LW</u>					
UNIT/AREA <u>SK-MP-2</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION: <u>FFP-WTF</u>				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY													
ACCNT													
6000 SPECIAL FACILITIES-EQUIPMENT SUMMARY													
1100 COLUMNS							221 600				150		
1200 VESSELS							1 343 800				680		
1300 HEAT EXCHANGERS							48 300				170		
1500 PUMPS							34 100				425		
2300 CONCENTRATION EQUIPMENT							140 500				160		
2400 AGITATORS MIXERS							9 800				320		
2800 OTHER MAJOR EQUIPMENT							9 900				120		
SUB TOTAL							1 808 000				2025		
65% PRODUCTIVITY (2025 ÷ .65) - 2025											1090		
											3115		
		3115	MH			16.60						51 700	
TOTAL FOR SK-MP-2							1 808 000				3115	51 700	1 859 700

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE/UCC-ND		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: DC						
UNIT/AREA (SK-MP-2) CMP EXTRACTION		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
1100	COLUMNS											
	FFP-WTF - COL 6-2	1	EA	25,000			25000				50	
	304L OR 316L STAINLESS COLUMN, 24" DIA X 30" TOP VESSEL, 18" DIA X 24" BOTTOM VESSEL, 6" SCH 40 PIPE COLUMN W/ INTERNAL NOZZLE PLATES, O.A. HEIGHT = 27' ±. DESIGN PRESS., 30 PSIG, Q.A. LEVEL I	25000	\$	.15			3800					
	FFP-WTF - COL 7-2	1	EA	50,000			50000				50	
	HASTELLOY "C" STRIP COLUMN, 24" DIA X 30" TOP VESSEL, 18" DIA X 24" BOTTOM VESSEL, 6" SCH 40 PIPE COLUMN W/ INTERNAL NOZZLE PLATES, O.A. HEIGHT - 27' ± DESIGN PRESSURE - 30 PSIG, 1400 LB Q.A. LEVEL I	50000	\$	.15			7500					
	FFP-WTF - COL 5-2	1	EA	30,000			30000				50	
	304L OR 316L EXTRACTION COLUMN 24" DIA X 30" TOP VESSEL, 18" DIA X 24" BOTTOM VESSEL, 6" SCH 40 PIPE COLUMN W/ INTERNAL NOZZLE PLATES, O.A. HEIGHT - 35' ± DESIGN PRESSURE - 30 PSIG Q.A. LEVEL I	30000	\$	.15			4500					
	TOTAL						120800				150	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY: <u>GRAHAM</u>		PRICED BY:		DATE:		SHEET <u> </u> OF <u> </u>								
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE/UCC-ND</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AC</u>								
UNIT/AREA (SK-MP-2) <u>CMP EXTRACTION</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
<u>1200</u>	<u>VESSELS</u>													
	<u>FFP-WTF-TK 8-2, 29-2, 9-2,</u>													
	<u>27-2, & 28-2</u>													
	<u>6000 LITER CAPACITY, 304L OR</u>	<u>5</u>	<u>EA</u>		<u>40</u>						<u>200</u>			
	<u>316L STAINLESS, 15 PSIG DESIGN</u>	<u>33500</u>	<u>LB</u>	<u>7</u>			<u>234500</u>							
	<u>PRESSURE, ASME CODE STAMPED</u>													
	<u>WITH 2 INTERNAL COOLING COILS,</u>													
	<u>66" DIA X 96" T-T</u>													
	<u>Q. A. LEVEL I</u>	<u>234500</u>	<u>\$</u>	<u>.15</u>			<u>35200</u>							
	<u>FFP-WTF-TK 6-2</u>	<u>1</u>	<u>EA</u>											
	<u>10,600 LITER CAPACITY, 304L OR</u>	<u>10000</u>	<u>LB</u>	<u>7</u>			<u>70000</u>				<u>60</u>			
	<u>316L STAINLESS, 15 PSIG DESIGN</u>													
	<u>PRESSURE, ASME CODE STAMPED,</u>													
	<u>WITH 2 INTERNAL COOLING COILS.</u>													
	<u>78" DIA X 10'-0" T-T</u>													
	<u>Q. A. LEVEL I</u>	<u>70000</u>	<u>\$</u>	<u>.15</u>			<u>10500</u>							
	<u>FFP-WTF-TK-212 & 215</u>	<u>2</u>	<u>EA</u>		<u>20</u>						<u>40</u>			
	<u>140 LITER CAPACITY, 304L OR 316L</u>	<u>440</u>	<u>LB</u>	<u>9</u>			<u>4000</u>							
	<u>STAINLESS, 15 PSIG DESIGN PRESSURE,</u>													
	<u>ASME CODE STAMPED. 16" DIA X</u>													
	<u>40" T-T</u>													
	<u>Q. A. LEVEL II</u>	<u>4000</u>	<u>\$</u>	<u>.09</u>			<u>400</u>							
	<u>GRAYLOC HUBS FOR ABOVE 8 VESSELS - 1/2"</u>	<u>2</u>	<u>EA</u>	<u>1600</u>			<u>3200</u>				<u>INCL W/ VESSEL</u>			
	<u>3/4"</u>	<u>4</u>	<u>EA</u>	<u>1600</u>			<u>6400</u>							
	<u>1"</u>	<u>10</u>	<u>EA</u>	<u>1700</u>			<u>17000</u>							
	<u>1 1/2"</u>	<u>37</u>	<u>EA</u>	<u>2200</u>			<u>81400</u>							
	<u>2"</u>	<u>60</u>	<u>EA</u>	<u>2900</u>			<u>174000</u>							
	<u>3"</u>	<u>12</u>	<u>EA</u>	<u>4100</u>			<u>49200</u>							
	<u>12"</u>	<u>12</u>	<u>EA</u>	<u>18600</u>			<u>223200</u>				<u>300</u>			
	<u>TOTAL</u>						<u>909000</u>							

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1300	HEAT EXCHANGERS											
	FFP-WTF-HE-2-2, HE-3-2											
	DUTY: 11,000 BTU/HR; SHELL											
	15 PSIG, TUBES 100 PSIG DESIGN;											
	ALL 304L OR 316L STAINLESS,											
	PROCESS IN-86°F, OUT-72°F; COOLING											
	MEDIUM IN-65°F, SURFACE-20 FT ²											
	Q.A. LEVEL J											
	2	EA	3000		30	6000			60			
	FFP-WTF-HE-234, HE-242											
	DUTY 1.4 X 10 ⁶ BTU/HR; SHELL											
	15 PSIG TUBES 100 PSIG DESIGN											
	ALL 304L OR 316L STAINLESS,											
	PROCESS IN-212°F OUT-200°F											
	COOLING MEDIUM IN-110°, OUT-125°F											
	SURFACE: 225 FT ²											
	Q.A. LEVEL I											
	2	EA	17,400		40	34000			80			
	TOTAL											
						46000			140			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: AC						
UNIT/AREA (SK-MP-2) CMP EXTRACTION		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-WTF-P-219, P-220, P-222, P-223, P-230, P-232, P-236, P-238, P-240,	9	EA	2000			18000			180		
	316 STAINLESS POSITIVE DISPL. ROTARY PUMP, 1.4 GPM @ 50 PSIG w/ 15 FOOT SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 50 TO 350 RPM, 3/4 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH SEALS. TUTHILL MODEL 8A Q.A. LEVEL I	18000	\$	.18			3200					
	FFP-WTF-P-244	1	EA	1500			1500			20		
	316 STAINLESS POSITIVE DISPL. ROTARY PUMP, 3/8 - 3/4 GPM @ 50 PSIG w/ 15 FOOT SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 45-100 RPM, 1/2 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH SEALS, TUTHILL MODEL 4A Q.A. LEVEL I	1500	\$	.18			300					
	TOTAL						23000			200		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCNT	JET PUMPS											
1500												
	STEAM JET EJECTOR, 13 GPM											
	CAPACITY, 15 FT. SUCTION LIFT,											
	30 FT. DISCHARGE HEAD; BARSTOCK											
	316L OR 304L WITH BUTTWELD											
	CONN'S. PENBERTHY SIZE 4A,											
	SERIES 1A	15	EA	670	15		10100			225		
	FFP-WTF-J-216, 217, 224, 225, 226,											
	227, 228, 229, 231, 233, 235, 237,											
	239, 241 & 243											
	Q.A. LEVEL II	10100	\$	.10			1000					
	TOTAL						11100			225		
	GRAND TOTAL SK-MP-2 PUMPS						34100			425		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY	PRICED BY	DATE	SHEET _____ OF _____			
JOB NO.: 5872-1	CLIENT: DOE	TYPE OF ESTIMATE: CONCEPTUAL	CKD BY: N2			
UNIT/AREA DESCRIPTION CAPACITY	QUANTITY UNIT	COST OR M/HRS PER UNIT MATL M/H LAB \$	MATERIAL EXPENSE	SUBCONTRACT M/HRS DOLLARS	LABOR M/HRS DOLLARS	TOTAL DOLLARS
ACCNT 2300						
CONCENTRATION EQUIPMENT						
FFP-WTF - CONC 2-2, CONC 3-2	2 EA	50			100	
316 STAINLESS, 30"DIA X 10' W/ 36"DIA X 24" DISENGAGING SECTION, DESIGN: 15 PSIG @ 250°F, WORKING CAP - 1000 LITERS	6400 LB	8	51200			
FURNISHED W/ REBOILER, 1.4X10 ⁶ BTU/HR DUTY, TUBE AND SHELL DESIGN 100 PSIG @ 350°F SURFACE - 20 FT² ±	2 EA	3750 30	7500		60	
GRAYLOC HUBS + 1"	14 EA	1700	23800			
+ 1½"	6 EA	2200	13200			
+ 6"	4 EA	9000	36000			
QA LEVEL I	58700 \$	.15	8800			
TOTAL			140500		160	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF					
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY							
UNIT/AREA		QUANTITY		COST OR M/HR PER UNIT		MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION		UNIT		PER UNIT									
CAPACITY													
ACCNT													
2800 OTHER MAJOR EQUIPMENT													
FFP-INTF-SME-251,-252,-253		3		EA 3000 20		9000				60			
PULSING MECHANISM, W/ POPPET VALVES, AIR OPERATED, SOLENOID CONTROLLED, W/ MOUNTING FRAME AND TIMER.													
(ALLOWANCE)													
TOTAL						9000				60			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE <u>7-20-79</u>		SHEET <u> </u> OF <u> </u>							
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>LW</u>							
UNIT/AREA <u>SK-MP-3</u>		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB\$	M/HR\$	DOLLARS	M/HR\$	DOLLARS			
CAPACITY													
ACCNT													
6000 SPECIAL FACILITIES-EQUIPMENT SUMMARY													
1100 COLUMNS							195	700				150	
1200 VESSELS							1	051	300			590	
1300 HEAT EXCHANGERS								7	000			60	
1500 PUMPS								22	400			205	
2200 SEPARATION EQUIPMENT								6	00			40	
2400 AGITATORS MIXERS								36	600			300	
2800 OTHER MAJOR EQUIPMENT								13	200			340	
SUB TOTAL							1	326	800			1685	
65% PRODUCTIVITY (1685 ÷ .65) - 1685												907	
												2592	
		2592	MH			16.60						43	000
TOTAL FOR SK-MP-3							1	326	800			2592	43 000 1 369 800

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>Graham</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>AC</u>						
UNIT/AREA <u>SK-MP-3</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>1100</u>	<u>COLUMNS</u>											
	<u>FFP-WTF - COL 2-3</u>	<u>1</u>	<u>EA</u>	<u>27,000</u>			<u>27,000</u>			<u>50</u>		
	<u>304L OR 316L STAINLESS COLUMN,</u>	<u>1600</u>	<u>LB</u>	<u>16.88</u>								
	<u>24" DIA X 30" TOP VESSEL, 18" DIA</u>											
	<u>X 24" BOTTOM VESSEL, 6" SCH 40</u>											
	<u>PIPE COLUMN WITH INTERNAL</u>											
	<u>NOZZLE PLATES. O.A. HEIGHT =</u>											
	<u>32' FT ±, 30 PSIG DESIGN</u>											
	<u>Q.A. LEVEL I</u>											
	<u>FFP-WTF - COL 3-3, 4-3</u>	<u>2</u>	<u>EA</u>	<u>25,000</u>			<u>50,000</u>			<u>100</u>		
	<u>304L OR 316L STAINLESS COLUMN,</u>	<u>2600</u>	<u>LB</u>	<u>19.23</u>								
	<u>24" DIA X 30" TOP VESSEL, 18" DIA</u>											
	<u>X 24" BOTTOM VESSEL, 6" SCH 40</u>											
	<u>PIPE COLUMN WITH INTERNAL</u>											
	<u>NOZZLE PLATES. O.A. HEIGHT =</u>											
	<u>27' ±, 30 PSIG DESIGN</u>											
	<u>Q.A. LEVEL I</u>											
	<u>GRAYLOC HUBS FOR ABOVE 3 COLS - 3/4"</u>	<u>9</u>	<u>EA</u>	<u>1600</u>			<u>14,400</u>			<u>INCL W/ COLS</u>		
	<u>1"</u>	<u>9</u>	<u>EA</u>	<u>1700</u>			<u>15,300</u>					
	<u>1 1/2"</u>	<u>15</u>	<u>EA</u>	<u>2200</u>			<u>33,000</u>					
	<u>2"</u>	<u>6</u>	<u>EA</u>	<u>2900</u>			<u>17,400</u>					
	<u>6"</u>	<u>3</u>	<u>EA</u>	<u>9000</u>			<u>27,000</u>					
	<u>QA LEVEL I</u>	<u>77000</u>	<u>\$</u>	<u>.15</u>			<u>11,600</u>					
	<u>TOTAL FOR SK-MP-3 COLUMNS</u>						<u>195,700</u>			<u>150</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>								
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>ASL</u>								
UNIT/AREA <u>SK-MP-3 CMP EXTRACTION</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
<u>1200</u> <u>VESSELS</u>														
<u>FFP-WTF-TK 5-3, 42-3, 43-3,</u>		<u>6</u>	<u>EA</u>		<u>50</u>							<u>300</u>		
<u>44-3, 45-3, 46-3</u>		<u>40200</u>	<u>LB</u>	<u>7</u>			<u>281400</u>							
<u>6700LB EA X 6 = 40200 LB</u>														
<u>6000 LITER CAPACITY, 304L OR 316L</u>														
<u>STAINLESS, 15 PSIG DESIGN, ASME</u>														
<u>CODE STAMPED, WITH 2 INTERNAL</u>														
<u>COOLING COILS. 66" DIA X 96" T-T</u>														
<u>Q. A. LEVEL I</u>		<u>281400</u>	<u>\$</u>	<u>.15</u>			<u>42200</u>							
<u>FFP-WTF-TK 47-3</u>		<u>1</u>	<u>EA</u>											
<u>2200 LITER CAPACITY, 304L OR 316L</u>		<u>3450</u>	<u>LB</u>	<u>8</u>			<u>27600</u>					<u>30</u>		
<u>STAINLESS, 15 PSIG DESIGN, ASME</u>														
<u>CODE STAMPED, WITH 2 INTERNAL</u>														
<u>COOLING COILS. 48" DIA X 66" T-T</u>														
<u>Q. A. LEVEL I</u>		<u>27600</u>	<u>\$</u>	<u>.15</u>			<u>4200</u>							
<u>GRAYLOC HUBS FOR ABOVE 7 VESSELS:</u>														
<u>1"</u>		<u>4</u>	<u>EA</u>	<u>1700</u>			<u>6800</u>							
<u>1 1/2"</u>		<u>41</u>	<u>EA</u>	<u>2200</u>			<u>90200</u>							
<u>2"</u>		<u>67</u>	<u>EA</u>	<u>2900</u>			<u>194300</u>							
<u>3"</u>		<u>14</u>	<u>EA</u>	<u>4100</u>			<u>57400</u>							
<u>8"</u>		<u>2</u>	<u>EA</u>	<u>12100</u>			<u>24200</u>							
<u>12"</u>		<u>12</u>	<u>EA</u>	<u>18600</u>			<u>223200</u>							
<u>TOTAL</u>							<u>951500</u>					<u>330</u>		

INCL W/ VESSELS

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u> </u>						
UNIT/AREA <u>SK-MP-3 CMP EXTRACTION</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LABS		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1200	VESSELS											
	FFP-WTF-TK-304,-308,-315,-316	4	EA		20						80	
	1200 LITER CAPACITY, 304L or 316L	3800	LB	8			30400					
	STAINLESS, 15 PSIG DESIGN, ASME											
	CODE STAMPED, WITH INTERNAL											
	COOLING COIL, VERTICAL MOUNTING											
	39"DIA X 54" T-T INCL NOZZLES											
	FFP-WTF-TK-320,-321	2	EA		20						40	
	600 LITER CAPACITY, 304L or 316L	1250	LB	9			11300					
	STAINLESS, 15 PSIG DESIGN, ASME											
	CODE STAMPED, WITH INTERNAL											
	COOLING COIL, VERTICAL MOUNTING											
	30"DIA X 48" T-T INCL NOZZLES											
	FFP-WTF-TK-328,-329	2	EA		20						40	
	2200 LITERS CAPACITY, 314L or 316L	3100	LB	8			24800					
	STAINLESS, 15 PSIG DESIGN, ASME											
	CODE STAMPED, WITH INTERNAL											
	COOLING COIL, VERTICAL MOUNTING											
	48"DIA X 66" T-T INCL NOZZLES											
	FFP-WTF-TK-332,-333	2	EA		20						40	
	3000 LITER CAPACITY, 304L or 316L	3900	LB	8			31200					
	STAINLESS, 15 PSIG DESIGN, ASME											
	CODE STAMPED, WITH INTERNAL											
	COOLING COIL, VERT. MOUNTING											
	48"DIA X 96" T-T INCL NOZZLES											
	TOTAL						97700				200	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE						SHEET		OF					
JOB NO.		CLIENT:		TYPE OF ESTIMATE:								CKD BY:					
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE			SUBCONTRACT			LABOR			TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$				M/HRS	DOLLARS	M/HRS	DOLLARS				
CAPACITY																	
ACCNT																	
1200 VESSELS																	
FFP-WTF-TK-335,-337,-339		3	EA		20									60			
300 LB		7				2100											
AIR RECEIVER, ASME BOARD SIZE R-1, CARBON STEEL, ASME CODE STAMPED FOR 150 PSIG. 100LBx3=300LB/NCL NOZZIES																	
TOTAL						2100							60				
GRAND TOTAL SK-MP-3 VESSELS						1051300							590				

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY: <u>GAHAN</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>								
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>kr</u>								
UNIT/AREA <u>SK-MP-3 CMP EXTRACTION</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCT														
<u>1500</u>	<u>PUMPS</u>													
	<u>FFP-WTF - P-302, -303</u>	<u>2</u>	<u>EA</u>	<u>2500-</u>		<u>5000</u>					<u>40</u>			
	<u>316 STAINLESS POSITIVE DISPLACEMENT ROTARY PUMP, 6-14 GPM @ 50 PSIG WITH 15 FOOT SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE - 230 TO 500 RPM, 1 HP, 460V, 3ϕ, 60 HZ TEFC MOTOR, MECH. SEALS</u>													
	<u>TUTHILL MODEL 15A</u>													
	<u>Q.A. LEVEL I</u>	<u>5000</u>		<u>\$.18</u>		<u>900</u>								
	<u>FFP-WTF - P-312, -318, -319, -324</u>	<u>4</u>	<u>EA</u>	<u>2000-</u>		<u>8000</u>					<u>80</u>			
	<u>316 STAINLESS POSITIVE DISPLACEMENT ROTARY PUMP, 1-4 GPM @ 50 PSIG WITH 15 FOOT SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 50 TO 350 RPM, 3/4 HP, 460V, 3ϕ, 60 HZ TEFC MOTOR, MECH. SEALS.</u>													
	<u>TUTHILL MODEL 8A</u>													
	<u>Q.A. LEVEL I</u>	<u>8000</u>		<u>\$.18</u>		<u>1500</u>								
	<u>TOTAL</u>					<u>15400</u>					<u>120</u>			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF							
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:									
UNIT/AREA		DESCRIPTION		CAPACITY		COST OR M/HR PER UNIT		MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
ACCNT		QUANTITY		UNIT		MATL		M/H		LAB \$		M/HR		DOLLARS	
1500		JET PUMPS													
		FFP-WTF-J-317, -330, -334													
		STEAM JET EJECTOR, 13GPM CAPACITY, 15FT. SUCTION LIFT, 30FT. DISCHARGE HEAD, BARSTOCK 304L OR 316L STAINLESS WITH BUTTWELD CONN'S., DENBERTHY SIZE 4A, SERIES 1A		3 EA		670		15		2000		45			
		Q. A. LEVEL II		2000		\$.10				200					
		TOTAL								2200		45			
		GRAND TOTAL - SK-MP-3 PUMPS								22400		205			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
2400	AGITATORS, MIXERS											
	FFP-WTF-AG-351,-352,-353,-354,	4	EA	3600	20		14400			80		
	TOP ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAINLESS WETTED PARTS, MOTOR IS 1 HP 460V, 3Φ, 60 HZ TEFC CHEMINEER MODEL VMN-10 Q.A. LEVEL II											
		14400	\$	.10			1500					
	FFP-WTF-AG-355	1	EA				2400			20		
	TOP ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAINLESS WETTED PARTS, MOTOR IS 3/4 HP, 460V, 3Φ, 60 HZ TEFC CHEMINEER MODEL VHN-7 Q.A. LEVEL II											
		2400	\$	.10			300					
	TOTAL											
							18600			100		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u>1</u> OF <u>1</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AC</u>						
UNIT/AREA <u>SK-MP-3 CMP EXTRACTION</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
2400	AGITATORS, MIXERS											
	FFP-WTF-AG-341,-342,-343,-344,	4	EA	1500	20		6000			80		
	TOP ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAINLESS WETTED PARTS, MOTOR IS 1/2 HP, 460V, 3Φ, 60 HZ TEFC CHEMINEER MODEL VHN-5											
	FFP-WTF-AG-345,-346	2	EA	1200	20		2400			40		
	TOP ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAINLESS WETTED PARTS, MOTOR IS 1/4 HP, 110V, 1Φ, 60 HZ TEFC CHEMINEER MODEL VHN-2											
	FFP-WTF-AG-347,-348,-349,-350	4	EA	2400	20		9600			80		
	TOP ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAINLESS WETTED PARTS, MOTOR IS 3/4 HP, 460V, 3Φ, 60 HZ TEFC CHEMINEER MODEL VHN-7											
	TOTAL						18 000			200		
	GRAND TOTAL SK-MP-3 AGITATORS, MIXERS						36 600			300		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF					
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:							
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS		
CAPACITY													
ACCNT													
2800		AIR CFTS											
FFP-WTF-AL-301,-305,-306,-307,-309,-310,-311,-313,-314,-356,-325,-326,-327,-331 (ALLOW)		14	EA	300	20		4200			280			
TOTAL							4200			280			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY:		R				
UNIT/AREA SK-MP-3		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
2800												
FFP-WTF-SME-336,-338,-340		3	EA	3000	20		9000			60		
PULSING MECHANISM, w/ POPPET VALVES, AIR OPERATED, SOLENOID CONTROLLED, w/ MOUNTING FRAME AND TIMER												
(ALLOWANCE)												
TOTAL							9000			60		
GRAND TOTAL SK-MP-3 OTHER/ MAJOR EQUIPMENT							13 200			340		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE <u>7-20-79</u>		SHEET <u> </u> OF <u> </u>								
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>LW</u>								
UNIT/AREA <u>SK-MP-4</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
6000 SPECIAL FACILITIES-EQUIPMENT SUMMARY														
1200	VESSELS						2	227	200			1530		
1300	HEAT EXCHANGERS							120	800			280		
1500	PUMPS							48	500			520		
1800	COMPRESSORS & BLOWERS							8	900			120		
2200	SEPERATION EQUIPMENT							92	000			400		
2300	CONCENTRATION EQUIPMENT							168	500			170		
2400	AGITATORS, MIXERS							5	100			140		
2800	OTHER MAJOR EQUIPMENT								300			20		
SUB TOTAL							2	671	300			3180		
65% PRODUCTIVITY (3180 ÷ .65) - 3180												1712		
												4892		
		4892	MH			16.60						81	200	
TOTAL FOR SK-MP-4							2	671	300			4892	81	200 2 752 500

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>DC</u>						
UNIT/AREA <u>SK-MP-4 NITRIC ACID RECON'y</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>1200</u>	<u>VESSELS</u>											
	<u>FFP-WTF-TK 22-4, 25-4, 26-4,</u>	<u>7</u>	<u>EA</u>		<u>50</u>						<u>350</u>	
	<u>30-4, 45-4, -38-4, 43-4</u>											
	<u>6700LB EA x 7 = 46900LB</u>	<u>46900</u>	<u>LB</u>	<u>7</u>			<u>328300</u>					
	<u>6000 LITER CAPACITY, 304L OR</u>											
	<u>316L STAINLESS, 15PSIG DESIGN, ASME</u>											
	<u>CODE STAMPED, W/ 2 INTERNAL</u>											
	<u>COOLING COILS, VERT. MOUNT.</u>											
	<u>66" DIA X 96" T-T</u>											
	<u>Q.A. LEVEL I</u>	<u>328300</u>	<u>\$</u>	<u>.15</u>			<u>49300</u>					
	<u>FFP-WTF-TK 20-4</u>	<u>1</u>	<u>EA</u>									
		<u>14,600</u>	<u>LB</u>	<u>6</u>			<u>87600</u>				<u>70</u>	
	<u>20,500 LITERS CAPACITY, 304L OR 316L</u>											
	<u>STAINLESS, 15PSIG DESIGN, ASME</u>											
	<u>CODE STAMPED, WITH 2 INTERNAL</u>											
	<u>COOLING COILS, VERT. MOUNT.</u>											
	<u>96" DIA X 13-0" T-T INCL NOZZLES</u>											
	<u>Q.A. LEVEL I</u>	<u>87600</u>	<u>\$</u>	<u>.15</u>			<u>13200</u>					
	<u>FFP-WTF-TK-44-4</u>	<u>1</u>	<u>EA</u>									
		<u>10200</u>	<u>LB</u>	<u>6</u>			<u>61200</u>				<u>60</u>	
	<u>10,600 LITER CAPACITY, 304L OR 316L</u>											
	<u>STAINLESS, 15PSIG DESIGN, ASME</u>											
	<u>STAMPED, W/ 2 INTERNAL COOLING</u>											
	<u>COILS, VERT. MOUNT.</u>											
	<u>78" DIA X 9'-6" T-T</u>											
	<u>Q.A. LEVEL I</u>	<u>61200</u>	<u>\$</u>	<u>.15</u>			<u>9200</u>					
	<u>GRAYLOC HUBS FOR ABOVE - 1 1/2"</u>	<u>49</u>	<u>EA</u>	<u>2200</u>			<u>107800</u>				<u>INCL. w/ VESSELS</u>	
	<u>2"</u>	<u>45</u>	<u>EA</u>	<u>2900</u>			<u>130500</u>					
	<u>3"</u>	<u>16</u>	<u>EA</u>	<u>4100</u>			<u>65600</u>					
	<u>8"</u>	<u>14</u>	<u>EA</u>	<u>12100</u>			<u>169400</u>					
	<u>12"</u>	<u>2</u>	<u>EA</u>	<u>18600</u>			<u>37200</u>					
	<u>TOTAL</u>											

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1200	VESSELS											
	FFP-WTF-FRAC-1-4	1	EA									
	304L or 316L FRACTIONATING TOWER, TOP SECTION 48" DIA X 14' T-T, BOTTOM SECTION, 36" DIA X 16' T-T, DESIGN-25PSIG & FULL VACUUM @ 250°F. ASME CODE STAMPED, 24 BUBBLE TRAYS WITH REBOILER, 650 SQ.FT SURFACE, Q = 8X10 ⁶ BTU/HR Q.A. LEVEL I	14000	LB	8			112000				130	
	FFP-WTF-AB 13-4	1	EA									
	304L or 316 STAINLESS NOx ABSORBER 60" DIA X 27' T-T ASME CODE STAMPED FOR 15PSIG @ 150°F. 5 BUBBLE TRAYS & TRAY COOLERS Q.A. LEVEL I	10500	LB	7			73500				100	
	GRAYLOC HUBS FOR ABOVE - 3/4"	20	EA	1600			32000				INCL ABOVE	
	1"	3	EA	1700			5100					
	1 1/2"	13	EA	2200			28600					
	2"	2	EA	2900			5800					
	3"	2	EA	4100			8200					
	4"	3	EA	5500			16500					
	8"	1	EA	12100			12100					
	(USE STD NOZ) 24"	1	EA									
	TOTAL						366600				280	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRANAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>				CKD BY: <u>AL</u>				
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HR\$	DOLLARS	
ACCNT												
<u>1200</u>	<u>VESSELS</u>											
	<u>FFP-WTF-TK-405, -406</u>	<u>2</u>	<u>EA</u>		<u>40</u>						<u>80</u>	
	<u>1850 LB EA X 2 = 3700 LB</u>	<u>3700</u>	<u>LB</u>	<u>8</u>			<u>29600</u>					
	<u>3000 LITERS CAPACITY, 304L</u>											
	<u>STAINLESS, 15 PSIG DESIGN, ASME</u>											
	<u>CODE STAMPED, w/ INTERNAL COILING</u>											
	<u>COIL, VERTICAL MOUNT.</u>											
	<u>54" DIA X 72" T-T INCL NOZZLES</u>											
	<u>FFP-WTF-TK-443</u>	<u>1</u>	<u>EA</u>									
	<u>150 LB</u>	<u>150</u>	<u>LB</u>	<u>10</u>			<u>1500</u>				<u>20</u>	
	<u>3 CU. FT. VOLUME, 304 STAINLESS,</u>											
	<u>15 PSIG DESIGN, ASME CODE</u>											
	<u>STAMPED, VERTICAL MOUNT.</u>											
	<u>14" DIA X 30" T-T INCL NOZZLES</u>											
	<u>FFP-WTF-TK-451</u>	<u>1</u>	<u>EA</u>									
	<u>5150 LB</u>	<u>5150</u>	<u>LB</u>	<u>7</u>			<u>36100</u>				<u>40</u>	
	<u>3740 GALS. CAPACITY, 304 OR</u>											
	<u>316 STAINLESS, 25 PSIG AND FULL</u>											
	<u>VACUUM DESIGN, ASME CODE</u>											
	<u>STAMPED, VERTICAL MOUNT.</u>											
	<u>84" DIA X 128" T-T</u>											
	<u>Q. A. LEVEL I</u>	<u>36100</u>	<u>\$</u>	<u>.15</u>			<u>5400</u>					
	<u>GRAYLOC HUBS - 1"</u>	<u>1</u>	<u>EA</u>	<u>1700</u>			<u>1700</u>				<u>INCL AB</u>	
	<u>4"</u>	<u>3</u>	<u>EA</u>	<u>5500</u>			<u>16500</u>				<u>↓</u>	
	<u>TOTAL</u>						<u>90800</u>				<u>140</u>	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET _____ OF _____							
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AS</u>							
UNIT/AREA <u>SK-MP-4 NITRIC ACID RECOVERY</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY													
ACCNT													
<u>1200 VESSELS</u>													
<u>FFP-WTF-TK-411</u>		<u>1</u>	<u>EA</u>										
		<u>2400</u>	<u>LB</u>	<u>8</u>				<u>19200</u>				<u>30</u>	
<u>5750 LITERS CAPACITY, 304L OR</u>													
<u>316L STAINLESS, 15 PSIG DESIGN,</u>													
<u>ASME CODE STAMPED, VERT.</u>													
<u>MOUNT. 66" DIA X 7'-6" T-T</u>													
<u>Q.A. LEVEL I</u>		<u>19200</u>	<u>\$</u>	<u>.15</u>				<u>2900</u>					
<u>FFP-WTF-TK-423</u>		<u>1</u>	<u>EA</u>										
		<u>600</u>	<u>LB</u>	<u>9</u>				<u>5400</u>				<u>20</u>	
<u>650 LITERS CAPACITY, 304L OR 316L</u>													
<u>STAINLESS, 15 PSIG DESIGN, ASME</u>													
<u>CODE STAMPED, VERT. MOUNT</u>													
<u>30" DIA X 54" T-T</u>													
<u>Q.A. LEVEL I</u>		<u>5400</u>	<u>\$</u>	<u>.15</u>				<u>800</u>					
<u>FFP-WTF-VES-427</u>		<u>1</u>	<u>EA</u>										
		<u>3675</u>	<u>LB</u>	<u>7</u>				<u>25800</u>				<u>40</u>	
<u>5750 LITERS CAPACITY, 304L OR</u>													
<u>316L STAINLESS, 15 PSIG DESIGN,</u>													
<u>ASME CODE STAMPED, 66" DIA X</u>													
<u>7'-6" T-T SUMP WITH 30' COLUMN</u>													
<u>OF 3" SCH. 40 PIPE.</u>													
<u>Q.A. LEVEL I</u>		<u>25800</u>	<u>\$</u>	<u>.15</u>				<u>3900</u>					
<u>GRAYLOC HUBS FOR ABOVE 3 VESSELS - 1"</u>		<u>6</u>	<u>EA</u>	<u>1700</u>				<u>10200</u>				<u>INCL ABOVE</u>	
<u>1 1/2"</u>		<u>10</u>	<u>EA</u>	<u>2200</u>				<u>22000</u>				<u>↓</u>	
<u>2"</u>		<u>4</u>	<u>EA</u>	<u>2900</u>				<u>11600</u>				<u>↓</u>	
<u>1 1/4"</u>		<u>1</u>	<u>EA</u>	<u>22000</u>				<u>22000</u>				<u>↓</u>	
<u>TOTAL</u>								<u>123800</u>				<u>90</u>	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET _____ OF _____						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE:		CKD BY: <u>AK</u>						
UNIT/AREA <u>SK-MP-4</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1300</u>	<u>HEAT EXCHANGERS</u>											
	<u>FFP-WTF-HE-410</u>	<u>1</u>	<u>EA</u>	<u>36,000</u>			<u>36,000</u>			<u>40</u>		
	<u>1.43 X 10⁶ BTUH DUTY, 304L OR</u>											
	<u>316L STAINLESS SHELL AND TUBES.</u>											
	<u>DESIGN: SHELL-15 PSIG, TUBES-</u>											
	<u>100 PSIG. SURFACE 600 SQ.FT.</u>											
	<u>Q.A. LEVEL I</u>	<u>36000</u>	<u>\$</u>	<u>.15</u>			<u>5400</u>					
	<u>FFP-WTF-HE-424</u>	<u>1</u>	<u>EA</u>	<u>10,000</u>			<u>10000</u>			<u>30</u>		
	<u>700,000 BTUH DUTY, 304L OR 316L</u>											
	<u>SHELL AND TUBES. DESIGN: SHELL-</u>											
	<u>15 PSIG, TUBES-100 PSIG.</u>											
	<u>SURFACE-110 SQ.FT.</u>											
	<u>Q.A. LEVEL I</u>	<u>10000</u>	<u>\$</u>	<u>.15</u>			<u>1500</u>					
	<u>FFP-WTF-HE-431</u>	<u>1</u>	<u>EA</u>	<u>2000</u>			<u>2000</u>			<u>30</u>		
	<u>30,000 BTUH DUTY, 304L OR 316L</u>											
	<u>STAINLESS SHELL AND TUBES.</u>											
	<u>DESIGN: SHELL-15 PSIG, TUBES</u>											
	<u>100 PSIG. SURFACE-5 SQ.FT</u>											
	<u>Q.A. LEVEL I</u>	<u>2000</u>	<u>\$</u>	<u>.15</u>			<u>300</u>					
	<u>TOTAL</u>						<u>55200</u>			<u>100</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY GRANAM		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE:		CKD BY: DC						
UNIT/AREA SK-MP-4		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1300	H.T. EXCHGRS.											
	FFP-WTF-HE-445 (Q.A.-I)	1	EA	16,000			16,000				30	
	10,000 BTUH DUTY, 304L OR 316L STAINLESS SHELL AND TUBES. DESIGN: SHELL 15 PSIG, TUBES-100 PSIG. SURFACE 200 SQ.FT.											
	FFP-WTF-HE-446 (Q.A.-I)	1	EA	4000			4000				30	
	20,000 BTUH DUTY, 304L OR 316L STAINLESS STEEL SHELL & TUBES. DESIGN: SHELL-15 PSIG, TUBES-100 PSIG. SURFACE-40 SQ.FT.											
	FFP-WTF-HE-463, -465 (Q.A.-I)	2	EA	16,000			32,000				60	
	220,000 BTUH DUTY, 304L OR 316L STAINLESS SHELL AND TUBES. DESIGN: SHELL-15 PSIG, TUBES-100 PSIG. SURFACE-200 SQ.FT.											
	FFP-WTF-HE-442 (Q.A.-I)	1	EA	3000			3000				30	
	20KW ELECTRICALLY HEATED GAS HEATER; 304 OR 316 STAINLESS HOUSING											
	QA LEVEL I FOR ALL ABOVE	55000	#	.15			8300					
	TOTAL						63300				150	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCNT												
1300		H.T. EXCHANGERS										
FFP-WTF-HE-467		1	EA	2000			2000			30		
1 RW ELECTRIC GAS HEATER, 304 OR 316 HOUSING Q.A. LEVEL I		2000	\$	.15			300					
TOTAL							2300			30		
GRAND TOTAL SK-MP-4 HEAT EXCHANGERS							120 800			280		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF							
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY									
UNIT/AREA		DESCRIPTION		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS	
CAPACITY						MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS		
ACCNT															
1500	PUMPS														
	FFP-WTF-P-401,-404,-418 -438,-440,-441	6	EA	2000-					12000			120			
	316 STAINLESS POSITIVE DISPLACE MENT ROTARY PUMP, 1-6 GPM @ 50 PSIG WITH 15 FT SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 50 TO 500 RPM, 1 HP, 460V, 3Ø, 60 HZ TEFC MOTOR, MECH. SEALS.														
	TUTHILL MODEL 8A Q.A. LEVEL I	12000	\$	.18					2200						
	FFP-WTF-P-421	1	EA	3500-					3500			20			
	316 STAINLESS POSITIVE DISPLACE- MENT ROTARY PUMP, 15-30 GPM @ 50 PSIG WITH 15 FT. SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 100-230 RPM, 3 HP, 460V, 3Ø, 60 HZ TEFC MOTOR, MECH. SEALS TUTHILL MODEL 2A-70A														
	TOTAL								17700			140			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF			
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:					
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY											
ACCT											
1500	PUMPS										
	FFP-WTF-P-425, -414, -435	3	EA	1500			4500			60	
	316 STAINLESS POSITIVE DISPLACEMENT ROTARY PUMP, 0-1. GPM @ 50 PSIG W/ 15 FT. SUCTION LIFT, VARIABLE SPEED DRIVE W/ REMOTE SPEED CONTROL, SPEED RANGE 45-150 RPM, 1/2 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH. SEALS										
	TUTHILL MODEL 4A Q.A. LEVEL I	4500	\$	.18			800				
	FFP-WTF-P-432, -433	2	EA	4000			8000			40	
	316 STAINLESS POSITIVE DISPLACEMENT ROTARY PUMP, 50 GPM @ 50 PSIG W/ 15 FT SUCTION LIFT, 5 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH. SEALS										
	TUTHILL MODEL 3A-120A										
	TOTAL						13300			100	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET _____ OF _____						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-WTF-P-428	1	EA	3000			3000				20	
	316 STAINLESS ROTARY PUMP, 12-24 GPM @ 50 PSIG w/15 FT SUCTION LIFT, VARIABLE SPEED DRIVE w/REMOTE SPEED CONTROL, SPEED RANGE 45-100 RPM, 1 1/2 Hp, 460V, 3Φ, 60 Hz TEFC MOTOR, MECH SEALS. TUTHILL MODEL 3A-120A											
	FFP-WTF-P-461	1	EA	2500			2500				20	
	316 STAINLESS ROTARY PUMP, 6-14 GPM @ 50 PSIG w/15 FT. SUCTION LIFT, VARIABLE SPEED DRIVE w/REMOTE SPEED CONTROL, SPEED RANGE 230-500 RPM, 1 Hp. 460V, 3Φ, 60 Hz TEFC MOTOR, MECH. SEALS. TUTHILL MODEL 15A											
	TOTAL						5500				40	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:								
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
1500		JET PUMPS												
FFP-WTF-J-402, -403, -413, -415, -416, -419, -420, -422, -430, -436, -437, -417, -409, -458, -459		15	EA	670	15		10	100				225		
STEAM JET EJECTOR, 13 GPM CAP, 15 FT LIFT, 30 FT DISCHARGE HEAD, BARSTOCK 304L OR 316L STAINLESS WITH BUTTWELD CONN'S														
PENBERTHY SIZE 4A, SERIES 1A Q.A. LEVEL II		10	100	\$	.10			1000						
FFP-WTF-J-426		1	EA	750			800				15			
STEAM JET EJECTOR, 235 CFM CAPACITY, 5" Hg SUCTION, 304L OR 316L STAINLESS BARSTOCK W/ BUTTWELD CONN'S														
PENBERTHY SIZE 5A, SERIES 1A Q.A. LEVEL II		800	\$	.10			100							
TOTAL							12	000			240			
GRAND TOTAL SK-MP-4 PUMPS							48	500			520			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE						SHEET _____ OF _____			
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: CONCEPTUAL						CKD BY: ne			
UNIT/AREA SK-MP-4 NITRIC ACID REC'Y		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS		
CAPACITY													
ACCNT 1800	COMPRESSORS & BLOWERS												
	FFPWTF - BLO-452, -453, -454	3	EA	2500	40		7500				120		
	250 SCFM CAPACITY @ 9"Hg VACUUM, 3550 RPM; 10 Hp, 460V, 3Ø, 60 HZ TEFC MOTOR 304 or 316 STAINLESS STEEL W/ INLET FILTER SILENCER, INTEGRAL BASE, DIRECT COUPLING DRIVE ROOTS WHISPAIL 3505J Q.A. LEVEL I	7500	\$	.18			1400						
	TOTAL						8900				120		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>DC</u>						
UNIT/AREA <u>SK-MP-4 NITRIC ACID REC'Y</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
2200 SEPARATION EQUIPMENT												
FFPWTF-F-447, -448, -449, 4-450		4	EA	20000	100		80000				400	
INCL GRAYLOC HUBS												
ABSOLUTE FILTER, OVERALL DIMEN. 24" X 24" X 11 1/2", RATED FLOW 850 CFM @ 1" W.G.; 0.3 MICRON, 99.97% EFF. DOP. GLASS PACK, METAL FRAME. FURNISHED WITH HOUSING AND PREFILTER.												
FLANDERS FILTERS												
Q.A. LEVEL 1		80000	\$	.15			12000					
TOTAL							92000				400	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:								
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCT														
2300	CONCENTRATION EQUIPMENT													
	FFP-WTF - CONC 3-4	1	EA											
	316L STAINLESS, 30" DIA X 10'-0"	3200	LB	8			25600				50			
	T-T w/ 36" DIA X 24" T-T													
	DISENGAGING SECTION, 15 PSIG													
	@ 350°F DESIGN, WORKING													
	CAPACITY 1000 LITERS													
	Q.A. LEVEL I	25600	\$	.15			3900							
	FURNISHED W/ REBOILER, 1.9 X	1	EA				3800				30			
	106 BTU/HR DUTY, 100 PSIG @													
	350°F SHELL AND TUBE													
	DESIGN. SURFACE 140 FT ²													
	Q.A. LEVEL I	3800	\$	.15			600							
	FFP-WTF - CONC 5-4	1	EA											
	316L STAINLESS, 42" DIA X 10'-0"	5200	LB	7			36400				60			
	T-T w/ 48" DIA X 24" T-T													
	DISENGAGING SECTION, 15 PSIG													
	@ 350°F DESIGN, WORKING													
	CAPACITY 1000 LITERS													
	Q.A. LEVEL I	36400	\$	.15			5500							
	FURNISHED W/ REBOILER, 1.2 X 10 ⁶	1	EA				3800				30			
	BTU/HR DUTY, 100 PSIG @ 350°F													
	SHELL & TUBE DESIGN													
	SURFACE 90 FT ²													
	Q.A. LEVEL I	3800	\$	.15			600							
	GRAYLOC HUBS ON CONCENTRATORS - 1"	14	EA	1700			23800				INCL ABOVE			
	1 1/2"	6	EA	2200			13200							
	6"	4	EA	9000			36000							
	10"	1	EA	15300			15300							

(USE STD NOZZLE)

TOTAL

-119-

168,500

170

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: AC						
UNIT/AREA SK-MP-5 SALT WASTE TREATMT		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1100	COLUMNS											
	FFP-WTF-COL 8-5	1	EA	27,000			27,000				50	
		1600	LB									
	304L OR 316L STAINLESS COLUMN 24"DIA X 30"T-T TOP VESSEL, 18" DIA X 24"T-T BOTTOM VESSEL, 6" SCH 40 PIPE COLUMN W/ INTERNAL NOZZLE PLATES, O.A. HEIGHT = 31' ± 30 PSIG DESIGN Q. A. LEVEL I	27000	\$	.15			4100					
	FFP-WTF-COL 9-5	1	EA	25,000			25000				50	
		1350	LB									
	304L OR 316L STAINLESS COLUMN W/ 24"DIA X 30"T-T TOP VESSEL, 18"DIA X 24"T-T BOTTOM VESSEL, 6" SCH 40 PIPE COLUMN W/ INTERNAL NOZZLE PLATES, O.A. HEIGHT = 26' ±, 30 PSIG DESIGN Q. A. LEVEL I	25000	\$	.15			3800					
	GRAYLOC HUBS FOR ABOVE 2 COLS - 3/4"	6	EA	1600			9600				INCL ABOVE	
	1"	6	EA	1700			10200					
	1 1/2"	10	EA	2200			22000					
	2"	4	EA	2900			11600					
	6"	2	EA	9000			18000					
	TOTAL						131300				100	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AK</u>						
UNIT/AREA <u>SK-MP-5 SALT WASTE TREATMT</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1200</u>	<u>VESSELS</u>											
	<u>FFP-WTF-TK 12-5, -RV35, &</u>	<u>3</u>	<u>EA</u>		<u>50</u>					<u>150</u>		
	<u>TK-515</u>	<u>20100</u>	<u>LB</u>	<u>7</u>			<u>140700</u>					
	<u>6000 LITERS CAPACITY, 304L OR</u>											
	<u>316L STAINLESS, 15 PSIG DESIGN,</u>											
	<u>ASME CODE STAMPED, 2 INTERNAL</u>											
	<u>COOLING COILS, 66" DIA X 96" T-T</u>											
	<u>Q.A. LEVEL I</u>	<u>140700</u>	<u>#</u>	<u>.15</u>			<u>21100</u>					
	<u>FFP-WTF-TK 10-5, TK-11-5,</u>	<u>2</u>	<u>EA</u>		<u>60</u>					<u>120</u>		
	<u>10,600 LITERS CAPACITY, 304L OR 316L</u>	<u>21000</u>	<u>LB</u>	<u>6</u>			<u>126000</u>					
	<u>STAINLESS, 15 PSIG DESIGN, ASME</u>											
	<u>CODE STAMPED, 2 INTERNAL</u>											
	<u>COOLING COILS, 78" DIA X 122" T-T</u>											
	<u>Q.A. LEVEL I</u>	<u>126000</u>	<u>#</u>	<u>.15</u>			<u>18900</u>					
	<u>FFP-WTF-TK-519, -527, -532</u>	<u>3</u>	<u>EA</u>		<u>20</u>					<u>60</u>		
		<u>4050</u>	<u>LB</u>	<u>8</u>			<u>32400</u>					
	<u>300 LITER WORKING CAPACITY, 304L</u>											
	<u>OR 316L STAINLESS, ASME CODE</u>											
	<u>STAMPED FOR 15 PSIG DESIGN,</u>											
	<u>INTERNAL DEMISTER SECTION,</u>											
	<u>12" DIA X 32" T-T</u>											
	<u>Q.A. LEVEL I</u>	<u>32400</u>	<u>#</u>	<u>.15</u>			<u>4900</u>					
	<u>TOTAL</u>						<u>344000</u>			<u>330</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT:		TYPE OF ESTIMATE:		CKD BY: <u>DC</u>						
UNIT/AREA <u>SK-MP-5 SALT WASTE TREATMT</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1200 VESSELS</u>												
<u>FFP-WTF-TK-511</u>		<u>1</u>	<u>EA</u>									
		<u>2150</u>	<u>LB</u>	<u>8</u>			<u>17200</u>			<u>30</u>		
<u>5000 LITERS CAPACITY, 304L OR 316L STAINLESS, ASME CODE STAMPED FOR 15PSIG, 66" DIA X 78" T-T INCL NOZZLES</u>												
<u>FFP-WTF-TK-522, -523</u>		<u>2</u>	<u>EA</u>		<u>20</u>					<u>40</u>		
		<u>3520</u>	<u>LB</u>	<u>8</u>			<u>28200</u>					
<u>2800 LITERS CAPACITY, 304L OR 316L STAINLESS STEEL, ASME CODE STAMPED FOR 15 PSIG, INTERNAL COILING COIL, 54" DIA X 5'-6" T-T INCL NOZZLES</u>												
<u>FFP-WTF-TK-520, -528</u>		<u>2</u>	<u>EA</u>		<u>20</u>					<u>40</u>		
		<u>200</u>	<u>LB</u>	<u>5</u>			<u>1000</u>					
<u>AIR RECEIVER, ASME BOARD SIZE R-1, CARBON STEEL, ASME CODE STAMPED FOR 150 PSIG, INCL NOZZLES</u>												
<u>GRAYLOC HUBS FOR VESSELS 1"</u>		<u>3</u>	<u>EA</u>	<u>1700</u>			<u>5100</u>			<u>INCL w/ VESSELS</u>		
<u>1 1/2"</u>		<u>14</u>	<u>EA</u>	<u>2200</u>			<u>30800</u>					
<u>2"</u>		<u>17</u>	<u>EA</u>	<u>2900</u>			<u>49300</u>					
<u>3"</u>		<u>4</u>	<u>EA</u>	<u>4100</u>			<u>16400</u>					
<u>8"</u>		<u>2</u>	<u>EA</u>	<u>12100</u>			<u>24200</u>					
<u>12"</u>		<u>2</u>	<u>EA</u>	<u>18600</u>			<u>37200</u>					
<u>TOTAL</u>							<u>209400</u>			<u>110</u>		
<u>GRAND TOTAL - SK-MP-5 VESSELS</u>							<u>553400</u>			<u>440</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRANHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT:		TYPE OF ESTIMATE:		CKD BY: <u>AY</u>						
UNIT/AREA <u>SK-MP-5</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1300</u>	<u>HEAT EXCHANGERS</u>											
	<u>FFP-WTF-HE-507</u>	<u>1</u>	<u>EA</u>	<u>36000</u>			<u>36000</u>			<u>40</u>		
	<u>4X10⁶ BTUH DUTY, 304L OR 316L STAINLESS STEEL SHELL AND TUBES, SHELL DESIGN-15 PSIG, TUBES-100 PSIG, SURFACE-600 SQ. FT. Q.A. LEVEL I</u>	<u>36000</u>	<u>\$</u>	<u>.15</u>			<u>5400</u>					
	<u>FFP-WTF-HE-508</u>	<u>1</u>	<u>EA</u>	<u>30,000</u>			<u>30000</u>			<u>30</u>		
	<u>2X10⁶ BTUH DUTY, 304L OR 316L STAINLESS STEEL SHELL AND TUBES. SHELL DESIGN-15 PSIG TUBES-100 PSIG. SURFACE-300 SQ. FT. Q.A. LEVEL I</u>	<u>30000</u>	<u>\$</u>	<u>.15</u>			<u>4500</u>					
	<u>FFP-WTF-HE-518</u>	<u>1</u>	<u>EA</u>	<u>3500</u>			<u>3500</u>			<u>30</u>		
	<u>10,000 BTUH DUTY, 304L OR 316L STAINLESS STEEL SHELL AND TUBES. DESIGN: SHELL-15 PSIG TUBES-100 PSIG. SURFACE 30 SQ. FT. Q.A. LEVEL I</u>	<u>3500</u>	<u>\$</u>	<u>.15</u>			<u>600</u>					
	<u>TOTAL</u>						<u>80000</u>			<u>100</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:								
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$			M'HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
1500		PUMPS (JET)												
FFP-WTF-J-501, -502, -524, -531		4	EA	670	15		2700				60			
STEAM JET EJECTOR, 13 GPM CAPACITY, 15 FT LIFT, 30 FT DISCHARGE HEAD, BARSTOCK 304L OR 316L STAINLESS W/ BUTTWELD CONN'S.														
PENRERTHY SIZE 4A, SERIES 1A Q.A. LEVEL II		2700	\$	.10			300							
TOTAL							3000			60				

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>DC</u>						
UNIT/AREA <u>SK-MP-5 SALT WASTE TREAT MT</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-WTF-P-503,-P-517,	2	EA	2000-		4000				40		
	316 STAINLESS POSITIVE DISPLACEMENT ROTARY PUMP, 1-6 GPM @ 50 PSIG, WITH 15 FT SUCTION LIFT, VARIABLE SPEED DRIVE W/ REMOTE SPEED CONTROL, SPEED RANGE 50-500 RPM, 1 HP, 460 V, 3 ϕ , 60 HZ TEFC MOTOR, MECH. SEALS TUTHILL MODEL 8A Q.A. LEVEL I	4000	\$	.18		800						
	FFP-WTF-P-506											
	316 STAINLESS POSITIVE DISPLACEMENT ROTARY PUMP, 6-14 GPM CAPACITY @ 50 PSIG W/ 15 FT SUCTION LIFT, VARIABLE SPEED DRIVE W/ REMOTE SPEED CONTROL, SPEED RANGE 230-500 RPM, 1 HP, 460 V, 3 ϕ , 60 HZ TEFC MOTOR, MECH. SEALS TUTHILL MODEL 15A Q.A. LEVEL I	1	EA	2500-		2500				20		
		2500	\$	.18		500						
	TOTAL					7800				60		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u> </u>						
UNIT/AREA <u>SK-MP-5 SALT WASTE TREATMENT</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		N/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	Pumps											
	FFP-WTF-P-509	1	EA	3500-			3500			30		
	316 STAINLESS POSITIVE DISPLACEMENT ROTARY PUMP, 15-30 GPM @ 50 PSIG w/ 15 FT. SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 100-230 RPM, 3 Hp, 460V, 3 ϕ , 60 HZ, TEFC MOTOR, MECH. SEALS.											
	TUTHILL MODEL 2A-120A Q.A. LEVEL I	3500	\$	.18			700					
	FFP-WTF-P-510	1	EA	4000-			4000			30		
	316 STAINLESS POSITIVE DISPLACE- MENT ROTARY PUMP, 24-65 GPM @ 50 PSIG w/ 15 FT SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 100-230 RPM, 5 Hp, 460V, 3 ϕ , 60 HZ TEFC MOTOR, MECH. SEALS											
	TUTHILL MODEL 3A-120A Q.A. LEVEL I	4000	\$	.18			800					
	TOTAL						9000			60		

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:								
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
1500 Pumps														
FFP-WTF - P-514, P-526, P-530 - P-535		4	EA	2000			8000					80		
316 STAINLESS POSITIVE-DISPLACEMENT ROTARY PUMP, 1-4 GPM @ 50 PSI w/ 15 FT SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 50-350 RPM, 3/4 HP, 460V., 3P, 60 HZ TEFC MOTOR, MECH. SEALS														
TOTHILL MODEL 8A Q.A. LEVEL I		8000	#	.18			1500							
TOTAL							9500					80		
GRAND TOTAL - SK-MP-5 PUMPS							29,300					240		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRANAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AL</u>						
UNIT/AREA <u>SK-MP-5</u>		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>WTF-FFP</u>				MATL	M/H	LAB\$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCT												
<u>2300 CONCENTRATION EQUIPMENT</u>												
<u>FFP-WTF- CONC 4-5</u>		<u>1</u>	<u>EA</u>									
		<u>3600</u>	<u>LB</u>	<u>7</u>			<u>25200</u>			<u>50</u>		
<u>316L STAINLESS, 30" DIA X 10" T-T w/</u>												
<u>36" DIA X 24" T-T DISENGAGING SECTION</u>												
<u>15 PSIG DESIGN @ 350°F. WORKING</u>												
<u>CAPACITY 1000 LITERS INCL NOZZLES</u>												
<u>Q. A. LEVEL I</u>		<u>25200</u>	<u>\$</u>	<u>.15</u>			<u>3800</u>					
<u>FURNISHED w/ REBOILER 4 X 10⁶</u>		<u>1</u>	<u>EA</u>	<u>4500</u>			<u>4500</u>			<u>30</u>		
<u>BTU/HR DUTY, 100 PSIG @ 350°F</u>												
<u>SHELL AND TUBE. SURFACE = 290 FT²</u>												
<u>Q. A. LEVEL I</u>		<u>4500</u>	<u>\$</u>	<u>.15</u>			<u>700</u>					
<u>FFP-WTF- CONC 7-5</u>		<u>1</u>	<u>EA</u>									
		<u>3200</u>	<u>LB</u>	<u>8</u>			<u>25600</u>			<u>50</u>		
<u>316L STAINLESS, 30" DIA X 10' T-T w/</u>												
<u>36" DIA X 24" T-T DISENGAGING SECTION</u>												
<u>15 PSIG @ 350°F DESIGN. WORKING</u>												
<u>CAPACITY 1000 LITERS INCL NOZZLES</u>												
<u>FURNISHED w/ REBOILER 2 X 10⁶ BTU/HR</u>		<u>1</u>	<u>EA</u>	<u>3800</u>			<u>3800</u>			<u>30</u>		
<u>DUTY, 100 PSIG @ 350°F SHELL &</u>												
<u>TUBE DESIGN SURFACE = 140 FT²</u>												
<u>Q. A. LEVEL I</u>		<u>3800</u>	<u>\$</u>	<u>.15</u>			<u>600</u>					
<u>TOTAL</u>							<u>64200</u>			<u>150</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRANAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>S872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>BC</u>						
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
ACCNT												
1100	COLUMNS											
	FFP-WTF COL 10-6, COL 12-6	2	EA	27,000			54000			100		
	304L OR 316L STAINLESS COLUMN, 24"DIA X 30" T-T TOP VESSEL, 18"DIA X 24" T-T BOTTOM VESSEL, 6" SCH. 40 PIPE COLUMN w/ INTERNAL NOZZLE PLATES. O.A. HEIGHT = 31 FT. ±, 30 PSIG DESIGN INCL NOZZLES Q.A. LEVEL I	54000	\$	.15			8100					
	FFP-WTF - COL 11-6	1	EA	27,000			27000			50		
	304L OR 316L STAINLESS COLUMN, 24"DIA X 30" T-T TOP VESSEL, 18"DIA X 24" T-T BOTTOM VESSEL, 6" SCH 40 PIPE COLUMN w/ INTERNAL NOZZLE PLATES, O.A. HEIGHT = 26' ±. 30 PSIG DESIGN INCL NOZZLES Q.A. LEVEL I	27000	\$	.15			4100					
	FFP-WTF - COL 13-6	1	EA	21,000			21000			50		
	304L OR 316L STAINLESS COLUMN, 24"DIA X 30" T-T TOP VESSEL, 18"DIA X 24" T-T BOTTOM VESSEL, 6" SCH. 40 PIPE COLUMN w/ INTERNAL NOZZLE PLATES, O.A. HEIGHT = 21 FT. ± 30 PSIG DESIGN INCL NOZZLES Q.A. LEVEL I	21000	\$	.15			3200			200		
	TOTAL						117400					

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRANAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>DC</u>						
UNIT/AREA <u>SK-MP-6 SALT WASTE TREATMT.</u>		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCNT												
<u>1200</u>	<u>VESSELS</u>											
	<u>FFP-WTF-TK 13-6, TK 23-6, -626, -629, -651</u>	<u>5</u>	<u>EA</u>		<u>50</u>						<u>250</u>	
		<u>33500</u>	<u>LB</u>	<u>7</u>			<u>234500</u>					
	<u>6000 LITER CAPACITY, 304L OR 316L STAINLESS, 15PSIG DESIGN, ASME CODE STAMPED, W/ 2 INTERNAL COOLING COILS, VERTICAL MOUNT. 66" DIA X 96" T-T Q.A. LEVEL I</u>	<u>234500</u>	<u>\$</u>	<u>.15</u>			<u>35200</u>					
	<u>FFP-WTF-TK-24-6, TK-613</u>	<u>2</u>	<u>EA</u>		<u>60</u>						<u>120</u>	
		<u>20400</u>	<u>LB</u>	<u>6</u>			<u>122400</u>					
	<u>10,000 LITER CAPACITY, 304L OR 316L STAINLESS, 15PSIG DESIGN W/ ASME CODE STAMP, 2 INTERNAL COOLING COILS, VERTICAL MOUNT 78" DIA X 96" T-T Q.A. LEVEL I</u>	<u>122400</u>	<u>\$</u>	<u>.15</u>			<u>18100</u>					
	<u>FFP-WTF-TK-645</u>	<u>1</u>	<u>EA</u>									
		<u>13000</u>	<u>LB</u>	<u>6</u>			<u>78000</u>				<u>70</u>	
	<u>15,000 LITER CAPACITY, 304L OR 316L STAINLESS, 15PSIG DESIGN W/ ASME CODE STAMP, 2 INTERNAL COOLING COILS, VERT. MOUNT. 90" DIA X 130" T-T Q.A. LEVEL I</u>	<u>78000</u>	<u>\$</u>	<u>.15</u>			<u>11700</u>					
	<u>TOTAL</u>						<u>500200</u>				<u>440</u>	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1200	VESSELS											
	FFP-WTF-TK-601,-606,-663,-642	4	EA		20						80	
		400	LB	5			2000					
	AIR RECEIVERS ASME BOARD SIZE R-1, CARBON STEEL, ASME CODE STAMPED FOR 150 PSIG INCL NOZZLES											
	FFP-WTF-TK-610,-611	2	EA		20						40	
		3700	LB	8			29600					
	2800 LITER CAPACITY, 304L OR 316L STAINLESS, 15 PSIG DESIGN w/ ASME CODE STAMP, INTERNAL COOLING COIL, VERT. MOUNT. 48" DIA X 86" T-T INCL NOZZLES											
	FFP-WTF-TK-618,-622,-633,-634,-638,-639	6	EA		20						120	
		5700	LB	8			45600					
	1200 LITER CAPACITY, 304L OR 316L STAINLESS, 15 PSIG DESIGN w/ ASME CODE STAMP, INTERNAL COOLING COIL, VERTICAL MOUNT. 39" DIA X 54" T-T INCL NOZZLES											
	TOTAL						77200				240	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1300 HEAT EXCHANGERS												
FFP-WTF-HE-4-6.		1	EA	5000			5000			30		
60,000 BTUH DUTY, 304L OR 316L STAINLESS STEEL SHELL AND TUBES. DESIGN: SHELL 15 PSIG, TUBES-100 PSIG. SURFACE 50 SQ. FT.												
Q.A. LEVEL I		5000	\$	.15			800					
FFP-WTF-HE-648		1	EA	5000			5000			30		
75,000 BTUH DUTY, 304L OR 316L STAINLESS STEEL SHELL AND TUBES. DESIGN: SHELL 15 PSIG, TUBES-100 PSIG. SURFACE 50 SQ. FT.												
Q.A. LEVEL I		5000	\$	.15			800					
FFP-WTF-HE-661		1	EA	23,000			23000			30		
2.5X10 ⁶ BTUH DUTY, 304L OR 316L STAINLESS STEEL SHELL AND TUBES. DESIGN: SHELL-30 PSIG, TUBES-100 PSIG. SURFACE-300 SQ. FT.												
Q.A. LEVEL I		23000	\$	.15			3500					
TOTAL							38000			90		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AC</u>						
UNIT/AREA <u>SK-MP-6 SALT WASTE TREAT.</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	Pumps											
	FFP-WTF-P-658	1	EA	1500			1500			20		
	316 STAINLESS POSITIVE DISPLACE- MENT ROTARY PUMP, 0-1 GPM @ 50 PSIG w/ 15 FT. SUCTION LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 45-150 RPM, 1/2 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH. SEALS.											
	TUTHILL MODEL 4A Q.A.-LEVEL I	1500	\$	.15			300					
	FFP-WTF-P-620,-623	2	EA	1500	20		3000			40		
	316 STAINLESS POSITIVE DISPLACE'NT ROTARY PUMP, 0-1 GPM @ 50 PSIG, VARIABLE SPEED DRIVE, SPEED RANGE 45-150 RPM, 1/2 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH. SEALS											
	TUTHILL MODEL 4A Q.A.-LEVEL III											
	TOTAL						4800			60		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF							
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:									
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS		
DESCRIPTION				MATL	M/H	LAB \$	M/HR\$	DOLLARS	M/HR\$	DOLLARS					
CAPACITY															
ACCNT															
1500		JET PUMPS.													
FFP-WTF - J-604, -612, -637, -644, -654, -657, -659, -660, -603		9	EA	670	15		6100					135			
STEAM JET EJECTOR, 134PM CAPACITY, 15 FT SUCTION LIFT, 30FT DISCHARGE HEAD, BARSTOCK 304L OR 316L STAINLESS W/ BUTTWELD CONN'S.															
PENBERTHY SIZE 4A, SERIES 1A Q. A. LEVEL II		6100	\$	.10			600								
TOTAL							6700					135			
GRAND TOTAL SK-MP-6 PUMPS							31100					355			

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
2300 CONCENTRATION EQUIPMENT												
FFP-WTF- CONC G-6		1	EA									
316 L STAINLESS, 30" DIA X 10' T-T, W/ 36" DIA X 24" T-T DISENGAGING SECTION, 15 PSIG DESIGN @ 350°F, WORKING CAPACITY, 1000 LITERS/HK NOZZLES		3600	LB	7			25200				50	
Q.A. LEVEL I		25200	\$	.15			3800					
FURNISHED W/ REBOILER, 2.5X 10' BTU/HR, 100 PSIG @ 350°F SHELL & TUBE DESIGN, SURFACE - 190 FT ²		1	EA	3800			3800				30	
Q.A. LEVEL I		3800	\$	.15			600					
TOTAL							33400				80	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: PC						
UNIT/AREA SK-MP-6		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
2400	AGITATORS, MIXERS											
	FFP-WTF-AG-614,-656	2	EA	900	20		1800				40	
	TOP-ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAIN- LESS WETTED PARTS, 1 1/2 HP. 460V, 3Φ, 60 HZ TEFC MOTOR, CHEMINEER MODEL VMN-15 Q.A-LEVEL I											
	FFP-WTF-AG-630	1	EA	750			800				20	
	TOP-ENTERING DUAL BLADED AGITATOR, 304L OR 316L STAIN- LESS WETTED PARTS, 1 HP. 460V, 3Φ, 60 HZ TEFC MOTOR CHEMINEER MODEL VMN-10 Q.A-LEVEL I											
	FFP-WTF-AG-608,-609	2	EA	600	20		1200				40	
	TOP-ENTERING DUAL BLADED AGITATOR 304L OR 316L STAINLESS WETTED PARTS, 3/4 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, CHEMINEER MODEL VMN-7											
	TOTAL						3800				100	

[illegible]

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: AC						
UNIT/AREA SK-MP-7		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
0500	PROCESS FEEDERS											
	FFP-WTF-FDR-715,-716,-719	3	EA	5000-			15000				90	
	VIBRATING CONVEYER, 316 STAINLESS CONSTRUCTION, 3 CFH MIN. CAPACITY, CLOSED TUBE TYPE, REMOTE CONTROLS, 1/2 HP, 460 V., 3 ϕ , 60 HZ TEFC MOTOR. VIBRA-SCREW MODEL 7-24 Q. A. LEVEL I	15000	\$	.18			2700					
	FFP-WTF-FDR-720	1	EA	10,000-			10000				40	
	VIBRATING CONVEYOR, TITANIUM CLAD STAINLESS STEEL CONSTRUCTION, 3 CFH MIN. CAPACITY, CLOSED TUBE TYPE, 1/2 HP, 460 V., 3 ϕ , 60 HZ TEFC MOTOR, REMOTE CONTROLS VIBRA-SCREW 7-24 OR EQUAL Q. A. LEVEL I	10000	\$	.18			1800					
	TOTAL						29500				130	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

M.T.O. BY BW

PRICED BY

DATE _____

SHEET _____ OF _____

JOB NO.: 5872-1

CLIENT: DOE

TYPE OF ESTIMATE: CONCEPTUAL

CKD BY:

UNIT/AREA SK-MP-7

DESCRIPTION **FFP-WTF**

CAPACITY

ACCNT

1200 VESSELS

FFP-WTF-TK 706,727,753

INCL DEMISTER

L 15 PSIG, CODE & FULL XR 8"

48" T-T 1/4" THK VERT W/ SPRAY

COIL - ALL 304L OR 316L SS

Q.A. LEVEL I

GRAYLOC HUBS

75.

 $3/4''$

74

TOTAL

45200

60

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>BW</u>						
UNIT/AREA <u>SK-MP-7</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>1200 VESSELS</u>												
<u>FFP WTF-TK-734</u>		<u>1</u>	<u>EA</u>									
		<u>2500</u>	<u>LB</u>	<u>30</u>			<u>75000</u>			<u>60</u>		
<u>1275L TI CLAD 316LSS 15 PS/G CODE</u>												
<u>STAMP FULL XR 75LF OF 1" SCH 80 TI</u>												
<u>COIL 139"Ø x 4'-9" HI REMOVABLE TOP</u>												
<u>HIGH SPEED MIXER PT CLAD TITANIUM</u>		<u>1</u>	<u>EA</u>				<u>190000</u>			<u>100</u>		
<u>ANODE GRAPHITE CATHODE</u>		<u>1</u>	<u>EA</u>				<u>10000</u>			<u>100</u>		
<u>GRAYLOG HUBS- 1 1/2</u>		<u>8</u>	<u>EA</u>	<u>2800</u>			<u>22400</u>			<u>INCL</u>		
<u>2"</u>		<u>6</u>	<u>EA</u>	<u>3700</u>			<u>22200</u>			<u> </u>		
<u>3"</u>		<u>4</u>	<u>EA</u>	<u>4800</u>			<u>19200</u>			<u> </u>		
<u>12"</u>		<u>1</u>	<u>EA</u>	<u>19800</u>			<u>19800</u>			<u> </u>		
<u>18"</u>		<u>1</u>	<u>EA</u>	<u>30300</u>			<u>30300</u>			<u>✓</u>		
<u>(PT ANODE COST FROM D.F. DAVIS</u>												
<u>6-19-79 MEMO)</u>												
<u>TOTAL</u>							<u>388900</u>			<u>260</u>		
<u>GRAND TOTAL SK-MP-7 VESSELS</u>							<u>1360200</u>			<u>770</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>Graham</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>AS</u>						
UNIT/AREA <u>SK-MP-7</u>		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCT												
<u>1300</u>	<u>HEAT EXCHANGERS</u>											
	<u>FFP-WTF-HE-705</u>	<u>1</u>	<u>EA</u>	<u>1000</u>			<u>1000</u>			<u>30</u>		
	<u>ELECTRIC GAS HEATER, 0.1KW</u>											
	<u>CAPACITY, 304L OR 316L</u>											
	<u>HOUSING.</u>											
	<u>Q.A. LEVEL I</u>	<u>1000</u>	<u>\$</u>	<u>.15</u>			<u>200</u>					
	<u>FFP-WTF-HE-710, -717</u>	<u>2</u>	<u>EA</u>	<u>2000</u>			<u>4000</u>			<u>60</u>		
	<u>2000 BTUH DUTY, 304L OR 316L</u>											
	<u>STAINLESS SHELL AND TUBES.</u>											
	<u>DESIGN: TUBES 100 PSIG,</u>											
	<u>SHELL-100 PSIG. SURFACE-</u>											
	<u>2 SQ.FT. Q.A. LEVEL I</u>	<u>4000</u>	<u>\$</u>	<u>.15</u>			<u>600</u>					
	<u>FFP-WTF-HE-726</u>	<u>1</u>	<u>EA</u>	<u>2500</u>			<u>2500</u>			<u>30</u>		
	<u>10,000 BTUH DUTY, 304L OR 316L</u>											
	<u>STAINLESS SHELL AND TUBES.</u>											
	<u>DESIGN: SHELL-15 PSIG, TUBES-</u>											
	<u>100 PSIG. SURFACE-12 SQ.FT.</u>											
	<u>Q.A. LEVEL I</u>	<u>2500</u>	<u>\$</u>	<u>.15</u>			<u>400</u>					
	<u>TOTAL</u>						<u>8700</u>			<u>120</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF			
JOB NO.		CLIENT:		TYPE OF ESTIMATE:		CKD BY:					
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$			M/HRS	DOLLARS	
CAPACITY											
ACCNT											
1300	HEAT EXCHANGERS										
	FFP-WTF - HE-728	1	EA	2500-		2500			30		
	5000 BTUH DUTY, 304L OR 316L STAINLESS SHELL & TUBES. DESIGN: SHELL-15PSIG, TUBES-100PSIG, SURFACE 10 SQ. FT. Q.A. LEVEL I	2500	#	.15		400					
	TOTAL					2900			30		
	GRAND TOTAL: SK-MP-7 HEAT EXCHANGERS					11600			150		

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.: 5872-1		CLIENT:		TYPE OF ESTIMATE:		CKD BY:		A/K						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
1400		FURNACES, COATERS.												
FFP-WTF - SME - 714		1	EA	20,000	-		20000				50			
ELECTRICALLY HEATED ROTARY ASHER, 316 STAINLESS STEEL, HORIZONTALLY MOUNTED, VARIABLE SPEED DRIVE, 300°C WORKING TEMP. 6 1/2" X 11'-2 1/2" LONG CYLINDER. Q.A. LEVEL I		20000	\$	.18			3600							
TOTAL							23600				50			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>101</u>						
UNIT/AREA <u>SK-MP-7 ALPHA WASTE</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1500</u>	<u>PUMPS</u>											
	<u>FFP-WTF-P-707,-767</u>	<u>2</u>	<u>EA</u>	<u>1500</u>			<u>3000</u>			<u>40</u>		
	<u>316 STAINLESS POSITIVE DISPLACEMENT</u>											
	<u>ROTARY PUMP, 0-1 1/2 GPM @</u>											
	<u>50 PSIG w/ 15 FT. SUCTION LIFT,</u>											
	<u>VARIABLE SPEED DRIVE w/</u>											
	<u>REMOTE SPEED CONTROL, SPEED</u>											
	<u>RANGE 45-200 RPM, 1/2 HP, 460V,</u>											
	<u>3φ, 60 HZ TEFC MOTOR, MECH-</u>											
	<u>SEALS.</u>											
	<u>TOTHILL MODEL 4A</u>											
	<u>Q. A. LEVEL I</u>	<u>3000</u>	<u>\$</u>	<u>.18</u>			<u>600</u>					
	<u>FFP-WTF-P-743</u>	<u>1</u>	<u>EA</u>	<u>2500</u>			<u>2500</u>			<u>20</u>		
	<u>316 STAINLESS POSITIVE DISPLACEMENT</u>											
	<u>ROTARY PUMP, 6-14 GPM @ 50</u>											
	<u>PSIG w/ 15 FT. SUCTION LIFT, VARIABLE</u>											
	<u>SPEED DRIVE w/ REMOTE SPEED</u>											
	<u>CONTROL, SPEED RANGE 230-500</u>											
	<u>RPM, 1 HP, 460V, 3φ, 60 HZ TEFC</u>											
	<u>MOTOR, MECH. SEALS</u>											
	<u>TOTHILL MODEL 15A</u>											
	<u>Q. A. LEVEL I</u>	<u>2500</u>	<u>\$</u>	<u>.18</u>			<u>500</u>					
	<u>TOTAL</u>						<u>6600</u>			<u>60</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: CONCEPTUAL		CKD BY: AC						
UNIT/AREA SK-MP-7 ALPHA WASTE		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	Pumps											
	FFP-WTF-P-751, -763	2	EA	2000			4000				40	
	316 STAINLESS POSITIVE DISPL. ROTARY PUMP, 1-6 GPM @ 50 PSIA w/ 15 FT SUCT. LIFT, VARIABLE SPEED DRIVE w/ REMOTE SPEED CONTROL, SPEED RANGE 50-500 RPM, 1 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH. SEALS TUTHILL MODEL BA Q. A. LEVEL I	4000	\$	.18			800					
	FFP-WTF-P-759	1	EA	4000			4000				30	
	316 STAINLESS POSITIVE DISPL. ROTARY PUMP, 24-65 GPM @ 50 PSIA, VARIABLE SPEED DRIVE, SPEED RANGE 100-230 RPM, 5 HP, 460V, 3Φ, 60 HZ TEFC MOTOR, MECH. SEALS TUTHILL MODEL 3A-120A Q. A. LEVEL III											
	TOTAL						8800				70	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>DOE</u>						
UNIT/AREA <u>SK-MP-7 ALPHA WASTE</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		W/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500		JET PUMPS										
FFP-WTF-J-722,-736,-737, -739,-756,-757		6	EA	670	15		4100				90	
STEAM JET EJELTOR, 13 GPM CAPACITY, 15 FT. SUCTION LIFT, 30 FT. DISCHARGE HEAD, 304 L BARSTOCK w/ BUTTWELD CONN'S.												
DENBERTHY SIZE 4A, SERIES 1A Q.A. LEVEL II		4100	\$	.10			400					
TOTAL							4500				90	
GRAND TOTAL SK-MP-7 PUMPS							19 900				220	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.		CLIENT:		TYPE OF ESTIMATE:						CKD BY:		
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCNT												
1800	COMPRESSORS & BLOWERS											
	FFP-WTF-BLO-701 & -702	2	EA	1400			2800			80		
	5 SCFM CAPACITY @ 9" Hg VACUUM, 2600 RPM, 1 1/2 HP, 460V, 3Φ, 60HZ TEFC MOTOR, 304 OR 316 STAINLESS W/ INLET FILTER SILENCER, INTEGRAL BASE DIRECT COUPLING DRIVE ROOTS WHISPAIR 1702 Q.A. LEVEL I	2800	\$	.18			500					
	TOTAL						3300			80		

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GARDNER</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>RC</u>						
UNIT/AREA <u>SK-MP-7</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>2200 SEPARATION EQUIP'T</u>												
<u>FFP-WTF-F-703, 4-704</u>		<u>2</u>	<u>EA</u>	<u>5000</u>	<u>30</u>		<u>10000</u>			<u>60</u>		
<u>ABSOLUTE FILTER, OVERALL</u>												
<u>DIMENSIONS 8" X 8" X 12", RATED</u>												
<u>FLOW 50 SCFM AT 1" W.G.</u>												
<u>0.3 MICRON, 99.97% EFFICIENCY</u>												
<u>DOP, GLASS PAK, METAL</u>												
<u>FRAME. FURNISHED WITH</u>												
<u>HOUSING AND PRE-FILTER</u>												
<u>FLANDERS FILTERS</u>												
<u>Q.A. LEVEL I</u>		<u>10000</u>	<u>\$</u>	<u>.15</u>			<u>1500</u>					
<u>FFP-WTF - F-711, -712</u>		<u>2</u>	<u>EA</u>	<u>250</u>	<u>20</u>		<u>500</u>			<u>40</u>		
<u>GAS FILTER, 304 OR 316 STAIN-</u>												
<u>LESS HOUSING WITH FIBER</u>												
<u>CARTRIDGE. 10 SCFM CAPACITY</u>												
<u>AT ATMOSP. PRESSURE</u>												
<u>CUNO 1B2G HOUSING W/</u>												
<u>2278-B3 CARTRIDGE, 5</u>												
<u>MICRON RATING</u>												
<u>Q.A. LEVEL I</u>		<u>500</u>	<u>\$</u>	<u>.15</u>			<u>100</u>					
<u>TOTAL</u>							<u>12100</u>			<u>100</u>		
<u>GRAND TOTAL SK-MP-7 SEPARATION EQUIPMENT</u>							<u>217200</u>			<u>240</u>		

ESTIMATE WORKSHEET

M.T.O. BY	PRICED BY	DATE	SHEET OF							
JOB NO.: 5872-1	CLIENT:	TYPE OF ESTIMATE:	CKD BY:							
UNIT/AREA DESCRIPTION CAPACITY	QUANTITY	UNIT	COST OR M/HRS PER UNIT	MATERIAL EXPENSE	SUBCONTRACT	LABOR	TOTAL DOLLARS			
			MATL	M/H	LAB \$	M/HRS	DOLLARS	M/HRS	DOLLARS	
ACCNT										
2600	HOPPERS									
	FFP-WTF-HO-713	1 EA								
	FEED HOPPER, 304L or 316 L STAINLESS STEEL, 35 CU.FT CAPACITY, WITH AIR-OPERATED SEAL PLATE. 36" DIA X 49" WITH CONE BOTTOM.	950 LB	8			7600		20		
	Q.A. LEVEL I	7600 \$	.15			1200				
	FFP-WTF - HO-718, HO-770	2 EA		20				40		
	FEED HOPPER, 304L or 316 L STAINLESS STEEL, 10 CU.FT. CAPACITY. 24" DIA X 53" INCLUDING A CONE BOTTOM	550 LB	10			5500				
	Q.A. LEVEL I	5500 \$	.15			900				
	GRAYLOC HUBS: 1"	7 EA	1700			11900		INCL		
	3"	5 EA	4100			20500		↓		
	TOTAL					47600		60		

M.T.O. BY		PRICED BY		DATE		SHEET		OF							
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:									
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS		
DESCRIPTION				MATL	M/H	LAB \$	M/HR\$	DOLLARS	M/HR\$	DOLLARS					
CAPACITY															
ACCNT															
2800		Air Lifts.													
FFR WTF - AL-708,-725,-723,-729,-738,-740,-752,-764,-765,-768, & -769.		11	EA	300	20		3300					220			
(ALLOWANCE)															
TOTAL							3300				220				

SERVICE UTILITIES
SK-MP-40, 40A, 40-1 (6000)

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:								
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$	M/HR	DOLLARS	M/HR	DOLLARS				
CAPACITY														
ACCNT														
6000 SPECIAL FACILITIES-EQUIPMENT SUMMARY														
1200	VESSELS						539	900				1530		
1300	HEAT EXCHANGERS						1	541	800			1910		
1500	PUMPS							237	400			2405		
1600	BOILERS							360	000			770		
1700	COOLING TOWERS							52	500			1750		
1800	COMPRESSORS & BLOWERS							53	000			330		
1900	TANKS						1	638	900			27115		
2200	SEPERATION EQUIPMENT							200	000			960		
2400	AGITATORS							1	200			40		
2800	OTHER MAJOR EQUIPMENT						1	033	500			15190		
SUB TOTAL							5	658	200			52080		
65% PRODUCTIVITY (52080 ÷ .65) - 52080												28043		
		80	123	MH		16.60						80123	1	330.000
TOTAL FOR SK-MP-40,40A,40-1							5	658	200			80123	1	330.000
														6.988.200

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>AC</u>						
UNIT/AREA <u>SK-MP-40</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1200</u> <u>VESSELS</u>												
<u>FFP-WTF-TK-4011</u>		<u>1</u>	<u>EA</u>									
<u>60 GAL C.S. API FUEL</u>		<u>250</u>	<u>LB</u>	<u>5</u>			<u>1300</u>			<u>20</u>		
<u>OIL TANK WITH MOUNTING</u>												
<u>SADDLES 24"DIA X 2'-8"</u>												
<u>T-T.</u>												
<u>QA LEVEL II</u>		<u>1300</u>	<u>\$</u>	<u>.15</u>			<u>200</u>					
<u>FFP-WTF-TK-4013</u>		<u>1</u>	<u>EA</u>									
<u>1000 GAL C.S. API FUEL</u>		<u>2365</u>	<u>LB</u>	<u>2</u>			<u>4800</u>			<u>30</u>		
<u>OIL STORAGE TANK,</u>												
<u>UNDERGROUND TYPE, WITH</u>												
<u>COAL-TAR ENAMEL COATING.</u>												
<u>60" DIA X 102" LONG.</u>												
<u>EXCAVATION + PREPARED BACKFILL</u>		<u>1</u>	<u>LOT</u>				<u>1800</u>			<u>230</u>		
<u>FFP-WTF-TK-4021, -4022</u>		<u>2</u>	<u>EA</u>	<u>40</u>						<u>80</u>		
<u>3800 GAL C.S. FUEL OIL</u>		<u>9000</u>	<u>LB</u>	<u>1.5</u>			<u>13500</u>					
<u>STORAGE TANK, HORIZ.</u>												
<u>MOUNTING W/ SUPPORT</u>												
<u>STRUCTURE 7'-0" DIA X</u>												
<u>12'-0" LONG.</u>												
<u>TOTAL</u>							<u>21600</u>			<u>360</u>		

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>								
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE/UCC-ND</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AL</u>								
UNIT/AREA <u>(SK-MP-40) UTILITIES</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT			LABOR			TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS			
CAPACITY														
ACCT														
<u>1200</u> <u>VESSELS</u>														
<u>FFP-WTF-TK-4047</u>		<u>1</u>	<u>EA</u>											
<u>5500 GAL CAPACITY, CARBON</u>		<u>9000</u>	<u>LB</u>	<u>2</u>			<u>18000</u>				<u>50</u>			
<u>STEEL WITH INTERIOR LINING OF</u>														
<u>EPOXY ENAMEL, 15 PSIG DESIGN,</u>														
<u>ASME CODE STAMPED, 84" DIA X</u>														
<u>17'-0" T-T, HORIZ MOUNTING.</u>														
<u>FFP-WTF TK-4039, -4041, 4007</u>		<u>3</u>	<u>EA</u>		<u>50</u>						<u>150</u>			
<u>12,000 GAL CAPACITY, CARBON</u>		<u>19,500</u>	<u>LB</u>	<u>1.70</u>			<u>33200</u>							
<u>STEEL, FLAT BOTTOMED WITH</u>														
<u>CONE ROOF, ATMOS PRESSURE,</u>														
<u>12' DIA X 14' HIGH</u>														
<u>FFP-WTF-TK-4040, -4042, -4043</u>		<u>4</u>	<u>EA</u>		<u>50</u>						<u>200</u>			
<u>+ -4044</u>		<u>26000</u>	<u>LB</u>	<u>5</u>			<u>130000</u>							
<u>12,000 GAL CAPACITY, 304L OR 316L</u>														
<u>STAINLESS, FLAT BOTTOMED WITH</u>														
<u>CONE ROOF, ATMOS. PRESSURE.</u>														
<u>12' DIA X 14' HIGH - INTERNALLY</u>														
<u>MOUNTED TANK HEATER, 16 FT²</u>														
<u>SURFACE, 316L CONSTRUCTION</u>														
<u>TOTAL</u>							<u>181200</u>				<u>400</u>			

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCNT												
1200 VESSELS												
FFP-WTF-TK4028												
L 15PSIG, CODE+FULLXR 36 Ø		745	LB	3			2300				20	
8'-0" T-T, THK VERT W/ NO												
LF COILS-ALL CARB STLW/PI+RY												
Q.A. LEVEL III												
TOTAL							2300				20	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

[illegible]

ESTIMATE WORKSHEET

- 190 -

-191-

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1300	HEAT EXCHANGERS											
	FFP-WTF-HE-4110,-4111,-4112	3	EA	95,000			285,000			180		
	HEAT EXCHANGER, 3.3 X 10 ⁶											
	BTUH DUTY, 304 OR 316											
	STAINLESS STEEL SHELL & TUBES.											
	2500 SQ.FT. SURFACE											
	FFP-WTF-HE-4120,-4121,-4122	3	EA	95,000			285,000			180		
	HEAT EXCHANGER, 3.125 X 10 ⁶											
	BTUH DUTY, 304 OR 316 STAINLESS											
	STEEL SHELL & TUBES.											
	2500 SQ.FT. SURFACE											
	FFP-WTF-HE-4130,-4131,-4132,-4133	4	EA	36,000			144,000			160		
	HEAT EXCHANGER, 800,000											
	BTUH DUTY, 304 OR 316 STAINLESS											
	STEEL SHELL & TUBES											
	600 SQ.FT. SURFACE											
	TOTAL						714,000			520		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE:		CKD BY: A.C.						
UNIT/AREA SK-MP-40-1		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION FFP-WTF				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
1300	HEAT EXCHANGERS											
	FFP-WTF-HE-4142,-4143-4144, -4145,-4146,-4147,-4157, -4158,-4159 HEAT EXCHANGER, 1.6 X 10 ⁶ BTUH DUTY, 304 OR 316 STAINLESS STEEL SHELL & TUBES 1250 SQ. FT. SURFACE.	9	EA	55,000	30		495,000			450		
	FFP-WTF-HE-4151,-4152	2	EA	30,000			60,000			60		
	HEAT EXCHANGER, 550,000 BTUH DUTY, 304 OR 316 STAINLESS STEEL SHELL & TUBES. 370 SQ. FT. SURFACE											
	FFP-WTF-HE-4166,-4167, -4168,-4169. HEAT EXCHANGER, 500,000 BTUH DUTY, 304 OR 316 STAINLESS STEEL SHELL & TUBES. 190 SQ. FT. SURFACE	4	EA	16,000			64,000			120		
	TOTAL						619,000			630		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-INTF-P-4001 A & B											
	2 EA 13500 90 27000 180											
	1000 GPM @ 100 PSI W/											
	600 FT SUCTION LIFT.											
	200 Hp V, 3P 60 Hz MOTOR											
	BRONZE IMPELLERS, ENAMELED											
	BOWLS											
TOTAL		27000 180										

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>G. LAWAN</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPT.</u>		CKD BY: <u>AK</u>						
UNIT/AREA <u>SK-MP-40</u>		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCNT												
<u>1500 PUMPS</u>												
<u>FFP-WTF-P-4008</u>		<u>1</u>	<u>EA</u>	<u>18800</u>			<u>18800</u>				<u>60</u>	
<u>1000 GPM @ 60 PSIG CAPACITY,</u>												
<u>ELECTRIC MOTOR DRIVEN FIRE</u>												
<u>PUMP. HORIZ, SINGLE STAGE</u>												
<u>CENTRIFUGAL C/W RELIEF VALVE,</u>												
<u>OUTSIDE HOSE VALVE HEAD,</u>												
<u>OPEN CONE, HOSE VALVES,</u>												
<u>ETC. 60HP, 460V, 3P, 60 HZ MOTOR.</u>												
<u>PEERLESS PUMP MODEL GAF13</u>		<u>1</u>	<u>EA</u>	<u>15000</u>			<u>15000</u>				<u>100</u>	
<u>1000 GPM @ 60 PSIG CAPACITY</u>												
<u>DIESEL ENGINE DRIVEN FIRE</u>												
<u>PUMP. HORIZ, SINGLE STAGE</u>												
<u>CENTRIFUGAL C/W RELIEF VALVE</u>												
<u>OUTSIDE HOSE VALVE HEAD,</u>												
<u>OPEN CONE, HOSE VALVES,</u>												
<u>ETC. DRIVEN BY 85 HP.</u>												
<u>DIESEL ENGINE</u>												
<u>PEERLESS PUMP MODEL GAF13</u>												
<u>W/ CUMMINS MODEL V8-210</u>												
<u>ENGINE</u>												
<u>FFP-WTF-P-4009</u>												
<u>TOTAL</u>							<u>33800</u>				<u>160</u>	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY						DATE			SHEET _____ OF _____							
JOB NO.		CLIENT:						TYPE OF ESTIMATE:			CKD BY:							
UNIT/AREA		QUANTITY UNIT		COST OR M/HRS PER UNIT			MATERIAL EXPENSE			SUBCONTRACT			LABOR				TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$				M'HRS	DOLLARS	M'HRS	DOLLARS					
CAPACITY																		
ACCNT																		
1500	PUMPS																	
	FFP-WTF-P- 4010 A & B	2	EA	2250	30			4500					60					
	100 GPM @ 60 PSIG BRONZE CENTRIFUGAL PUMP, 7 1/2 HP. 3500 RPM, 460V, 3Ø, 60 HZ MOTOR.																	
	PACO MODEL 1270-S , TYPE L																	
	FFP-WTF-P- 4006 A,B,& C	3	EA	2700	40			8100					120					
	750 GPM @ 75 FT TDH HORIZ. CENTRIFUGAL PUMP, BRONZE FITTED W/ 10 FT SUCTION LIFT. 20 HP, 3500 RPM, 460V, 3Ø, 60 HZ MOTOR																	
	PACO MODEL 4070-S , TYPE L																	
	TOTAL							12600					180					

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500		PUMPS										
FFP-WTF-P-4015 A, B, & C		3	EA	5000	65		15000				195	
HORIZ. END SUCTION CENTRIFUGAL PUMP, FRAME MOUNTED, C. IRON CASING w/ BRONZE TRIM, 2000 GPM @ 100 FT TDH, 75 HP, 1750 RPM, 460V, 60 Hz TEFC MOTOR												
PACO TYPE L, MODEL 6015-S OR 80121 / BOB FRANKLIN-PHONE ROOM Q 6-11-79 685-3250												
TOTAL							15000				195	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR\$ PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR\$	DOLLARS	M/HR\$	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-WTF-P-4033 AFB, 4034 AFB, 4035 AFB, 4036 AFB, 4037 AFB, 4038 AFB.	12	EA	1500	20		18000				240	
	20 GPM @ 100 FT TDH CENTRIFUGAL PUMP, STAINLESS STEEL, FRAME MOUNTED.											
	1 1/2 HP, 3500 RPM, 460 V, 3 ϕ 60 HZ TEFC MOTOR											
	PACO MODEL 1070-1, TYPE L											
	FFP-WTF-P-4012	1	EA	1000			1000				20	
	3 GPM @ 50 PSI, 200 SSU OIL PUMP, VANE TYPE W/ MECH. SEALS, FRAME MOUNTED.											
	3/4 HP, 460V, 3 ϕ , 60 HZ TEFC MOTOR.											
	BLACKMER MODEL X61											
	TOTAL						19000				260	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRANAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>NC</u>						
UNIT/AREA <u>SK-MP-40-1</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-WTF-P-4134, 4135, 4136, -4137, -4138, -4139, -4153, -4154, -4155 304 OR 316 STAINLESS, HORIZ. SINGLE STAGE, FRAME MOUNTED CENTRIFUGAL. 220 GPM @ 50 FT TDH, 5 Hp., 460V., 3 ϕ , 60 Hz TEFC MOTOR PACO MODEL 2050-1, TYPE L	9	EA	2300	30		22500			270		
	P-4148, -4149 304 OR 316 STAINLESS HORIZONTAL SINGLE STAGE FRAME MOUNTED CENTRIFUGAL. 75 GPM @ 50 FT. TDH, 2 HP, 3500 RPM, 460V., 3 ϕ , 60 Hz TEFC MOTOR. PACO MODEL 1550-1 TYPE L	2	EA	2000	-		4000			40		
	P-4160, -4161, -4162, -4163, -4170, -4171 304 OR 316 STAINLESS HORIZONTAL SINGLE STAGE FRAME MOUNTED CENTRIFUGAL. 20 GPM @ 50 FT TDH, 3/4 HP, 1750 RPM, 460V., 3 ϕ , 60 Hz TEFC MOTOR PACO MODEL 1070-1, TYPE L	6	EA	2000	-20		12000			120		
	TOTAL						38500			430		

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF							
JOB NO.		CLIENT:		TYPE OF ESTIMATE:						CKD BY:					
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE			SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$				M/HRS	DOLLARS	M/HRS	DOLLARS		
CAPACITY															
ACCNT															
1500	PUMPS														
	FFP-WTF-P-4020 A,B,C,D,E	5	EA	3000	50			15000				250			
	BOILER FEED PUMPS, 700 GPM @ 130 PSIG, 30 HP, 460V, 3Φ, 60 Hz, 3500 RPM MOTOR - 3 FT NPSH.														
	PACO TYPE OLM, MODEL 209 S-3														
	FFP-WTF-P-4050 A & B	2	EA	1500	20			3000				40			
	10 GPM @ 50 PSIG, 700 SSU OIL PUMP, VANE TYPE W/ MECH. SEALS, FRAME MOUNTED 1 Hp, 460V, 3Φ, 60Hz, 1800 RPM MOTOR														
	ROPER MODEL 26, SERIES A, SIZE DS														
	TOTAL							18000				290			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>										
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>AC</u>										
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT			LABOR			TOTAL DOLLARS		
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS					
ACCNT																
1500	PUMPS.															
	FFP-WTF-P-4058 A, B, & C	3	EA	3000			9000				120					
	HORIZ, CENTRIFUGAL PUMP, C.I. CASING, BRONZE TRIM, FRAME MOUNTED, END SUCTION TYPE, 640 GPM @ 80FT TDH, 20 HP, 3500 RPM, 460V, 3Φ, 60Hz TEFC MOTOR															
	PACO TYPE L, MODEL 4070-5															
	FFP-WTF-P-4054, -4055, -4056	3	EA	1500			4500				60					
	HORIZ. END SUCTION CENTRIFUGAL PUMP, 304 OR 316 STAINLESS, FRAME MOUNTED, 20 GPM @ 50 PSIG, 2 HP, 3500 RPM, 460V, 3Φ, 60Hz MOTOR															
	PACO TYPE L, MODEL 1070-1															
	TOTAL						13500				180					

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-WTF-P-4063 A&B	2	EA	3540			7000			70		
	HORIZ. END SUCTION CENTRIFUGAL PUMP, 304 OR 316 STAINLESS STEEL, FRAME MOUNTED, 300 GPM @ 80 FT TDH, 10 HP, 3500 RPM, 460V, 3Φ, 60 HZ TEFC MOTOR.											
	PACO TYPE L, MODEL 2570-5											
	FFP-WTF-P-4066 A&B, 4067A &B, -4074 A&B, -4075 A&B, -4070 A&B, -4071 A&B	12	EA	2000	20		24000			240		
	HORIZ. END SUCTION CENTRIFUGAL PUMP, 304 OR 316 STAINLESS, FRAME MOUNTED, 15 GPM @ 80 FT TDH, 1 1/2 HP, 3500 RPM, 460V, 3Φ, 60 HZ TEFC MOTOR.											
	PACO TYPE L, MODEL 1070-1											
	TOTAL						31000			310		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>Graham</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOG</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>AK</u>						
UNIT/AREA <u>SK-MP-40-1</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>1500</u>	<u>PUMPS</u>											
	<u>P- 4113, 4114, 4115</u>	<u>3</u>	<u>EA</u>	<u>2500-</u>			<u>7500</u>				<u>90</u>	
	<u>304 OR 316 STAINLESS STEEL</u>											
	<u>HORIZONTAL, SINGLE STAGE,</u>											
	<u>CENTRIFUGAL PUMP, 365 GPM</u>											
	<u>@ 50 FT TDH, FRAME MOUNTED,</u>											
	<u>7 1/2 HP, 3500 RPM, 460V, 3Φ,</u>											
	<u>60 HZ TEFC MOTOR</u>											
	<u>PACO MODEL 3070-5, TYPE L</u>											
	<u>P- 4117, -4118, -4119</u>	<u>3</u>	<u>EA</u>	<u>4000-</u>			<u>12000</u>				<u>90</u>	
	<u>304 OR 316 STAINLESS STEEL</u>											
	<u>HORIZ., SINGLE STAGE</u>											
	<u>CENTRIFUGAL PUMP, FRAME</u>											
	<u>MOUNTED, 425 GPM @ 50</u>											
	<u>FT TDH, 7 1/2 HP, 3500 RPM,</u>											
	<u>460V, 3Φ, 60 HZ TEFC</u>											
	<u>MOTOR</u>											
	<u>PACO MODEL 3070-5, TYPE L</u>											
	<u>P- 4126, -4127, -4124, -4125</u>	<u>4</u>	<u>EA</u>	<u>2000-</u>			<u>8000</u>				<u>80</u>	
	<u>304 OR 316 STAINLESS, HORIZONTAL,</u>											
	<u>SINGLE STAGE FRAME MOUNTED</u>											
	<u>CENTRIFUGAL PUMP, 110 GPM</u>											
	<u>@ 50 FT TDH, 2 HP, 3500 RPM</u>											
	<u>460V, 3Φ, 60 HZ TEFC MOTOR</u>											
	<u>PACO MODEL 1950-5, TYPE L</u>											
	<u>TOTAL</u>						<u>27500</u>				<u>260</u>	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET ____ OF ____						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE:		CKD BY: NC						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
1500	PUMPS											
	FFP-WTF-P-4096, -4097	2	EA	750	-		1500				40	
	56PM AT 50PSIG, ROTARY VANE TYPE FUEL OIL PUMP, FRAME MOUNTED, 1HP, 460V, 3-Ø, 60Hz MOTOR BLACKMER MODEL XB1											
	TOTAL						1500				40	
	GRAND TOTAL SK-MP-40,40A,40-1 PUMPS						237 400				2485	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GANNAN</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>RC</u>						
UNIT/AREA <u>SK-MP-40</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>1600</u>												
<u>BOILERS</u>												
<u>FFP-WTF. B-4017 & -4018</u>		<u>2</u>	<u>EA</u>	<u>175,000</u>			<u>350,000</u>			<u>700</u>		
<u>55,000 #/HR CAP @ 100 PSIG</u>												
<u>DRY & SAT., PACKAGED UNIT</u>												
<u>W/ COMPLETE CONTROLS, FORCED</u>												
<u>DRAFT, OIL FIRED, FULLY</u>												
<u>MODULATED, WATER TUBE TYPE</u>												
<u>CLEAVER BROOKS MODEL</u>												
<u>DL-74</u>												
<u>ALLOWANCE FOR STACK</u>		<u>1</u>	<u>EA</u>	<u>10,000</u>			<u>10,000</u>			<u>70</u>		
<u>TOTAL</u>							<u>360,000</u>			<u>770</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <i>Graham</i>		PRICED BY		DATE		SHEET <i>1</i> OF <i>1</i>						
JOB NO.: <i>5872-1</i>		CLIENT: <i>DOE</i>		TYPE OF ESTIMATE: <i>CONCEPT</i>		CKD BY: <i>AK</i>						
UNIT/AREA <i>SK-MP-40</i>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <i>FFP-WTF</i>				MATL	M/H	LABS		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<i>1800</i>	<i>Compressors & Blowers</i>											
	<i>FFP-WTF-AC-4026</i>	<i>1</i>	<i>EA</i>	<i>30,000</i>			<i>30,000</i>			<i>160</i>		
	<i>SINGLE STAGE, DOUBLE-ACTING</i>											
	<i>WATER COOLED, NON-LUBRICATED</i>											
	<i>AIR COMPRESSOR, VERTICAL TYPE.</i>											
	<i>475 SCFM CAP @ 90 PSIG,</i>											
	<i>450 RPM, 125 HP, 460V, 3Φ,</i>											
	<i>60 HZ MOTOR. FURNISHED WITH</i>											
	<i>INTAKE FILTER-SILENCER, V-BELT</i>											
	<i>DRIVE PB-3, AFTER COOLER, AND</i>											
	<i>CONTROLS.</i>											
	<i>JOY W60L-9, 14 1/2 X 9 H</i>											
	<i>FFP-WTF-AC-4027</i>	<i>1</i>	<i>EA</i>	<i>14,000</i>			<i>14,000</i>			<i>100</i>		
	<i>SINGLE STAGE, DOUBLE-ACTING</i>											
	<i>WATER COOLED, NON-LUBRICATED</i>											
	<i>AIR COMPRESSOR, VERTICAL TYPE.</i>											
	<i>125 SCFM @ 90 PSIG, 514 RPM.</i>											
	<i>40 HP, 460V, 3Φ, 60 HZ MOTOR,</i>											
	<i>FURNISHED WITH MOTOR,</i>											
	<i>V-BELT DRIVE, PB-1 AFTER COOLER</i>											
	<i>INTAKE FILTER-SILENCER AND CONTROLS</i>											
	<i>JOY W60L-7, 8 X 7</i>											
	<i>TOTAL</i>						<i>44,000</i>			<i>260</i>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5822-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>AC</u>						
UNIT/AREA <u> </u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
<u>1910</u>	<u>TANKS</u>											
	<u>FFP-WTF-TK-4000</u>	<u>1</u>	<u>EA</u>				<u>1450000</u>			<u>15000</u>		
	<u>200,000 GAL HIGH LEVEL WASTE STORAGE TANK, 41' DIA X 20' X 3/8" THICK, (105,000#) w/ CENTRAL BALLAST TANK, AIR LIFT CIRCULATORS, COOLING COILS, SUPPORTS, HEADER</u>											
	<u>1975 PRICING. (TRP) JOB 5347-1 ESCALATED TO 3Q79</u>											
	<u>FFP-WTF-TK-4005</u>	<u>1</u>	<u>EA</u>				<u>150000</u>			<u>10000</u>		
	<u>120,000 GALLON ELEVATED WATER STORAGE TANK, C/W TANK HEATER, MOUNTING STRUCTURE, BASE FOUNDATION</u>											
	<u>TOTAL</u>						<u>1600000</u>			<u>25000</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRAHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>													
JOB NO.: <u>5872-1</u>		CLIENT:		TYPE OF ESTIMATE:		CKD BY: <u>PC</u>													
UNIT/AREA	DESCRIPTION	CAPACITY	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE			SUBCONTRACT			LABOR			TOTAL DOLLARS		
ACCNT					MATL	M/H	LAB \$				M/HR	DOLLARS	M/HR	DOLLARS					
2200	SEPARATION EQUIP'T.																		
	FFP-WTF-F-4060 A & B		2	EA	10,000				20000					120					
	DEMINERALIZER PREFILTER, SAND TYPE, 200 GPM CAP. 6'-0" DIA X 8'-0" T-T.																		
	AMF CUNO MODEL 3D2 W7 SERIES 7278 CARTRIDGES																		
	FFP-WTF-F-4002 A, B, C, D, E & F		6	EA	15000	70			90000					420					
	SAND FILTER, 300 GPM, 8' DIA X 8'																		
	PERMUTIT TYPE G																		
	FFP-WTF-F-4005 A THRU F		6	EA	15000	70			90000					420					
	CARBON FILTERS, 300 GPM 8' DIA X 8'																		
	TOTAL																		
									700000					960					

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
2400		AGITATORS										
FFP-WTF-AG 4077,4078		2	EA	600	20		1200				40	
TOP-ENTERING, DUAL BLADED, AGITATOR, 304L OR 316L STAINLESS WETTED PARTS. 3/4 HP, 460V, 3Φ, 60 HZ TEFC MOTOR												
CHEMINEER MODEL VHN-7												
TOTAL							1200				40	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF			
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:					
UNIT/AREA		QUANTITY		COST OR M/HR		SUBCONTRACT		LABOR		TOTAL	
DESCRIPTION		UNIT		PER UNIT		EXPENSE		M/HR		DOLLARS	
CAPACITY											
ACCNT											
2800											
FFP-WTF-CHL-4104											
CHLORINATION UNIT, 1000GPM, 18 PPD CHLORINE		1 EA		4500		4500		30			
CAPITOL CONTROLS MOODEL 206MAS											
TOTAL						4500		30			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

M.T.O. BY		PRICED BY		DATE		SHEET		OF						
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY								
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE		SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$			M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY														
ACCNT														
2800		SPEC. MECH EQUIP'T												
FFP-WTF-SME-4016		1	EA	35000			35000					200		
PACKAGED COOLING TOWER TREATMENT UNIT, PH, TOTAL DISSOLVED SOLIDS, CORROSIVITY MONITORING INCLU. FLEED PUMPS STORAGE TANKS & CONTROLS FOR 1750 TON TOWER;														
CHARLES CRAWLEY CO.														
TOTAL							35000					200		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>GRANHAM</u>		PRICED BY		DATE		SHEET <u> </u> OF <u> </u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE:		CKD BY: <u>156</u>						
UNIT/AREA <u>SK-MP-40A</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>FFP-WTF</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
2800	Low Pressure CO ₂ STG. UNITS											
	FFP-WTF-SME-4076 A THRU I	9	EA	⁴⁸⁸⁰⁰ 51,200			439200			9150		
	10 TON CAP, LOW PRESSURE CO ₂ STORAGE UNITS, STEEL HOUSED W/ DUAL REFRIGERATION 2-3HP MOTORS, W/ ALL CONTROLS, ALARMS AND ACTIVATING DEVICES, PIPING.											
	CANVEX OR EQUAL											
	FFP-WTF-SME-4076 J THRU M	4	EA	²⁹²⁰⁰ 47,000			156800			3270		
	AS ABOVE EXCEPT: 6 TON UNIT, 2-2HP MOTORS											
	FFP-WTF-SME-4076 N	1	EA	⁵⁶⁰⁰⁰ 10,000			56000			1170		
	AS ABOVE EXCEPT: 12 1/2 TON UNIT, 2-3HP MOTORS											
	FFP-WTF-SME-4076 P	1	EA	³²⁰⁰⁰ 10,000			32000			670		
	AS ABOVE EXCEPT: 3 TON UNIT, 2-1 1/2 HP MOTORS											
	TOTAL						684000			14260		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <i>Graham</i>		PRICED BY		DATE		SHEET _____ OF _____						
JOB NO.: <i>5072-1</i>		CLIENT: <i>DOE</i>		TYPE OF ESTIMATE: <i>CONCEPT</i>		CKD BY: <i>JL</i>						
UNIT/AREA <i>SK-MP-40</i>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <i>FFP-WTF</i>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<i>2800 OTHER MAJOR EQUIP'T</i>												
<i>FFP-WTF-DRY-4029</i>		<i>1</i>	<i>EA</i>				<i>10 000</i>				<i>100</i>	
<i>COMPRESSED AIR DRYER, 300</i>												
<i>SCFM CAP, ELECTRICALLY</i>												
<i>REACTIVATED, DUAL TOWERS w/</i>												
<i>VALVES, AUTOMATIC CONTROLS.</i>												
<i>5 KW HEATER</i>												
<i>KEMP ORIO Model 150 E</i>												
<i>LEONARD ENGR (213) 781-1005 SAUL SHULMAN</i>												
<i>ROM PHONE Q</i>												
<i>TOTAL</i>							<i>10 000</i>				<i>100</i>	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET 1 OF 2							
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: RCM		CKD BY: AL							
UNIT/AREA		QUANTITY	UNIT	COST OR M/HRS PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION				MATL	M/H	LAB \$		M/HRS	DOLLARS	M/HRS	DOLLARS		
CAPACITY													
ACCT													
4400	INSTRUMENTS AND CONTROLS SUMMARY												
4402	Lab 4200 Control Valves	548	EA	505	1.7		276740			932			
4403	Lab 4200 Press Relief Valves	138	EA	1043	2		143930			276			
4404	Lab 4491 Level Instr.	184	EA	2743	11		504710			2024			
4405	Lab 4491 Gauge Glasses												
4406	Lab 4491 Flow and D/P Instr.	395	EA	735	8.5		290330			3358			
4407	Lab 4491 Pressure Instr.	166	EA	904	8		150060			1328			
4408	Lab 4491 Temperature Instr.	453	EA	207	3.9		93770			1767			
4409	Lab 4491 T/C and Wells	164	EA	997	3.3		163510			541			
4410	Lab 4491 Thermometers/Wells												
4411	Lab 4491 Electrical Switches	184	EA	123	2.6		22630			478			
4412	Lab 4491 Pressure Gauges	129	EA	53	2		6840			258			
4413	Lab 4491 Analyzers Systems	4	EA	19732	86		78920			344			
4414	Lab 4491 Miscellaneous	209	EA	382	16.4		807160			3428			
4415	Lab 4491 Orif. Plts/Meterruns												
4416	Lab 4492 Panel Mounted Instr.	1750	EA	213	2		372750			3500			
4417	Lab 4492 Control Panels	1	LT				208750			701			
4418	Lab 4491 Computers/Data Log.												
4419	Lab 4491 Multiplex Sys.												
4420	Furnished Installed By Other												
4421	Lab 4491 Furnished Loose By Other												
4422													
4423													
4424													
4425	Lab 4491 Sub. Hdr. Pipe, Mult. Spt.	}											
4426	Lab 4491 Instr. Housings		1	LT				162500			16010		
4427	Lab 4491 Instr. Instal. Mat'l.												
	C/F	4324					3282600			34945			

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.:		CLIENT:		TYPE OF ESTIMATE:		CKD BY:						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
4400	INSTRUMENTS AND CONTROLS SUMMARY											
	B/E	4324	EA				3282600				34945	
4481	Freight	1	LT				82100					
4499	Calibration	1	LT								6930	
	Subtotal	4324	EA				3364700				41875	
	Productivity 41875 MH ÷ .65	64423	MH			16.81					64423	1082950
	Total	4324	EA				3365000				64423	1083000 4448000

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE		SHEET _____ OF _____						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY:						
UNIT/AREA	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS	
DESCRIPTION			MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS		
CAPACITY												
ACCT												
6000	SPECIAL FACILITIES-COMPUTER											
0600	COMPUTER											
4600	ELECTRICAL WORK FOR COMPUTER											
² / ₃ COST OF 2Q77 JOB 5687-1, HTGR FUEL RECYCLE COMMERCIALIZATION ESTIMATE ESCALATED TO 3Q79 PRODUCTIVITY INCLUDED												
TOTAL												
						2 057 000						2 057 000
						309 000			31608	507 000		816 000
						2 366 000			31608	507 000		2 873 000

INSULATION
(6000)

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>BW</u>		DATE <u>7-20-79</u>				SHEET _____ OF _____				
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>				CKD BY:				
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
ACCNT												
7000	UTILITIES-SHIPPING CASK HAULERS											
3600	TRACTOR-TRAILER COMBINATION FOR HAULING ON SITE SHIPPING CASKS- 70T CAPACITY OFF ROAD DESIGN EST TRACTOR \$75000 EA, TRAILER \$60000 EA, PREP \$1660 EA	3	EA	136660	100		410000			300		
	SUBTOTAL						410000			300		
	65% PRODUCTIVITY-(300/.65)-300									162		
	TOTAL	462	MH		16.60		410000			462	7700	417700

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>BW</u>		PRICED BY <u>FA</u>		DATE <u>7-17-79</u>		SHEET <u>1</u> OF <u>1</u>						
JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE: <u>CONCEPTUAL</u>		CKD BY: <u>RD</u>						
UNIT/AREA		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCNT												
7000	UTILITIES											
	TUNNEL PIPING ONLY:											
4200	PIPE, 316LSS, SCH 40, 5MKS 1 1/2"	6,000	LF	14.00	.28							
*	✓ ✓ ✓ ✓ 2"	3,000	✓	17.00	.39							
	✓ ✓ SCH 80 X SCH 10 ✓ 1" X 3"	27,000	✓	25.00	.17							
	✓ VC 6"	3,000	✓	2.00	.2							
	SPRAY NOZZ (150 EA) (ALLOW)	1-	LOT	800.00	200.00							
	SUPPORTS * (ALLOW)	1-	LOT	300.00	300.00							
	TOTAL 2.2" Avg. φ	39,000	LF			827,000			27,740			
	SHORTS, REV'S	4,000	LF			99,000			3,330			
	X-RAY 360°/20					72,000			1,000			
	TESTING, CLEANING					2,000			1,400			
	TOTAL	43,000	LF			1,000,000			33,470			
	PRODUCTIVITY 33,470/.65								18,020			
	TOTAL					\$1,000,000			51,490			
	LABOR RATE	51,490	MA		(#17.48)				\$900,000			
	TOTAL	43,000	LF			1,000,000			51,490	\$900,000		
	Q.A. LEVEL					150,000						
4200	TOTAL	43,000	LF			\$1,150,000			51,490	\$900,000	\$205,000	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY		PRICED BY		DATE		SHEET		OF				
JOB NO.		CLIENT		TYPE OF ESTIMATE		CKD BY						
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
4600	ELECTRICAL-SUMMARY											
	4601 POWER GEAR		HP									
	4602 POWER DISTRIBUTION AG	5H-2 OF 10	HP				1 027 800			14775		
	4603 LIGHTING		SF									
	4604 INSTRUMENTATION		EA									
	4605 COMMUNICATIONS		LS									
	4606 BELOW GRADE		LS									
	4607 GROUNDING		ME									
	4608 HEAT TRACING		FT									
	4609 FIRE ALARM		LS									
	4610 CATHODIC PROTECTION		LS									
	4611 POLE LINE		FT									
	4620 MISCELLANEOUS GA LEVEL II	267930	ES	.08			21 400					
	TOTAL - DIRECT						1 049 200			14775		
	RMPCO - MAT'L - DIRECT COST		LS				1 049 200					
	LABOR (14775 MH ÷ .65 PROD)	22730	MH	\$16.04							364 600	
	SUBCONTRACT											
	MAT'L - DIRECT COST		LS									
	OVERHEAD & PROFIT		\$									
	LABOR (MH ÷ PROD)		MH	\$								
	OVERHEAD & PROFIT		\$									
4600	TOTAL ELECTRICAL						1 049 200			22730	364 600	1413 800
	AVE COST PER HORSEPOWER (TOTAL \$ ÷ HP)		\$	÷		HP						\$ /HP

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>FJM</u>		PRICED BY		DATE <u>6-12-79</u>		SHEET <u>4</u> OF						
JOB NO.: <u>5872-1</u>		CLIENT: <u>ORNL / UCC</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>TMS</u>						
UNIT/AREA <u>P&T FFP-WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>UTILITIES - 2000</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>ELECTRICAL</u>												
<u>7201</u>	<u>OUTSIDE SECURITY LIGHTING</u>											
	<u>250 W HPS FLOOD - POLE MTD</u>	<u>30</u>	<u>E</u>	<u>360</u>	<u>3.00</u>		<u>10500</u>			<u>90</u>		
	<u>500 W QUARTZ</u>	<u>60</u>	<u>E</u>	<u>50</u>	<u>1.50</u>		<u>3000</u>			<u>90</u>		
	<u>40' CL 4 WOOD POLE</u>	<u>30</u>	<u>E</u>	<u>350</u>	<u>4.00</u>		<u>10500</u>			<u>120</u>		
	<u>POLE HARDWARE FOR FIXT</u>	<u>30</u>	<u>LS</u>	<u>50</u>	<u>2.00</u>		<u>1500</u>			<u>60</u>		
	<u>DIG & BACKFILL</u>	<u>30</u>	<u>LS</u>	<u>-</u>	<u>3.00</u>		<u>-</u>			<u>90</u>		
	<u>AUTO PWR TRANSFER UNIT</u>	<u>30</u>	<u>E</u>	<u>50</u>	<u>3.00</u>		<u>1500</u>			<u>90</u>		
	<u>1KVA XFMR 480-120V</u>	<u>30</u>	<u>E</u>	<u>60</u>	<u>4.00</u>		<u>1800</u>			<u>120</u>		
	<u>1" RGS RISER</u>	<u>900</u>	<u>FT</u>	<u>.83</u>	<u>.10</u>		<u>750</u>			<u>90</u>		
	<u>1" RGS BELOW GROUND</u>	<u>8000</u>	<u>FT</u>	<u>.83</u>	<u>.08</u>		<u>6640</u>			<u>640</u>		
	<u>1" SUPPORTS ON POLE</u>											
	<u>1" FITTINGS ON POLE</u>											
	<u>6X6 WP BOXES</u>	<u>30</u>	<u>E</u>	<u>5.25</u>	<u>1.00</u>		<u>160</u>			<u>30</u>		
	<u>#12 AWG</u>	<u>2200</u>	<u>FT</u>	<u>.079</u>	<u>.008</u>		<u>170</u>			<u>18</u>		
	<u>#6 AWG</u>	<u>16000</u>	<u>FT</u>	<u>.20</u>	<u>.014</u>		<u>3200</u>			<u>224</u>		
	<u>TRENCH & BACKFILL</u>	<u>8000</u>	<u>FT</u>	<u>.75</u>	<u>.05</u>		<u>6000</u>			<u>400</u>		
	<u>PULLHOLES 7x4</u>	<u>11</u>	<u>E</u>	<u>890</u>	<u>2.00</u>		<u>9790</u>			<u>22</u>		
	<u>CHECKOUT</u>	<u>145</u>	<u>-</u>	<u>-</u>	<u>-</u>		<u>-</u>			<u>4</u>		
	<u>QA LEVEL II</u>											
							<u>55010</u>			<u>2088</u>		

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY F.J.M.		PRICED BY		DATE 6-12-79		SHEET 7 OF						
JOB NO.: 5872-1		CLIENT:		TYPE OF ESTIMATE:		CKD BY: FMS						
UNIT/AREA P&T FFP-WTF		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION UTILITIES - 7000				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
	ELECTRICAL											
7202	POWER DISTRIBUTION											
	2-DUCT BANKS CONC ENCASED w/ 8-4" & 2-3" PVC EACH 700' RUN EACH BANK		LS	-	-		33010				1666	
	TRENCHING & BACK FILL (1400')		LS	-	-		2100				700	
	CABLE 600 VOLT 600 MCM	9000	FT	4.79	.063		36710				567	
	CABLE 5000V 500 MCM (OKOQUARD EPR) #6	2250 4800	FT	3.201 .169	.067 .014		7200 810				151 67	
	CABLE CONTROL 19/C #12	4500	FT	2.40	.039		10800				176	
	30 HP CT FANS - 400 FT EACH	3	E	933	115		2800				345	
	MANHOLES 6 X 6	8	E	2200	4.00		17600				32	
	PULL HOLE 4 X 4	6	E	890	2.00		5340				12	
	2-DUCT BANKS, CONC ENCASED w/ 2-5" PVC EACH - 200' / BANK TR & BF	400 400	FT	6.44 1.75	.75 .05		2580 700				300 20	
	CABLE 15KV - 3 1/2" #40	1300	FT	1.895	.063		2460				82	
	SUBSTATION FEEDERS 3"- 3#2 15KV (4 X 30') (OKOQUARD = EPR)	120	FT	21.17	1.67		2540				200	
							124650				4318	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>F.J.M</u>		PRICED BY		DATE <u>6-12-79</u>		SHEET <u>9</u> OF <u> </u>						
JOB NO.: <u>5822-1</u>		CLIENT: <u>ORNL / UCC</u>		TYPE OF ESTIMATE: <u>CONCEPT</u>		CKD BY: <u>MS</u>						
UNIT/AREA <u>P&T FFP-WTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>UTILITIES - 7000</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
<u>ELECTRICAL</u>												
<u>7306 FENCE INTRUSION SYSTEM</u>												
<u>SENSOR CABLE (17 @ 100 m ea = 1700m)</u>		<u>1700</u>	<u>M</u>	<u>285</u>	<u>.05</u>		<u>4850</u>			<u>85</u>		
<u>SIGNAL PROCESSOR</u>		<u>6</u>	<u>E</u>	<u>1591</u>	<u>4.00</u>		<u>9550</u>			<u>24</u>		
<u>BATTERY & CHARGER</u>		<u>1</u>	<u>E</u>	<u>1000</u>	<u>30</u>		<u>1000</u>			<u>30</u>		
<u>1" RGS BELOW GROUND</u>		<u>2000</u>	<u>FT</u>	<u>.83</u>	<u>.08</u>		<u>1660</u>			<u>160</u>		
<u>TRENCH & BACKFILL</u>		<u>2000</u>	<u>FT</u>	<u>.75</u>	<u>.05</u>		<u>1500</u>			<u>100</u>		
<u>BOXES 6x6 WP</u>		<u>10</u>	<u>E</u>	<u>5.25</u>	<u>1.00</u>		<u>50</u>			<u>10</u>		
<u>WIRE 5/2/C #22</u>		<u>6000</u>	<u>FT</u>	<u>4.070</u>	<u>.075</u>		<u>24420</u>			<u>450</u>		
<u>WIRE #12 AWG</u>		<u>500</u>	<u>FT</u>	<u>.069</u>	<u>.008</u>		<u>30</u>			<u>4</u>		
<u>GATE CONNECTORS</u>		<u>4</u>	<u>E</u>	<u>50</u>	<u>2.00</u>		<u>200</u>			<u>8</u>		
<u>CHECKOUT</u>		<u>1</u>	<u>LS</u>				<u>-</u>			<u>8</u>		
<u>QA LVL II</u>												
							<u>43260</u>			<u>879</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY <u>F.J.M</u>		PRICED BY <u>1</u>		DATE <u>6-12-77</u>		SHEET <u>10</u> OF <u>10</u>						
JOB NO.: <u>5877-1</u>		CLIENT: <u>ORNL/UCC</u>		TYPE OF ESTIMATE:		CKD BY: <u>END</u>						
UNIT/AREA <u>P&T FFR-MTF</u>		QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
DESCRIPTION <u>UTILITIES -7000</u>				MATL	M/H	LAB \$		M/HR	DOLLARS	M/HR	DOLLARS	
CAPACITY												
ACCT												
	<u>ELECTRICAL</u>											
<u>7307</u>	<u>AREA SECURITY TV SYSTEM</u>											
	<u>DIAMOND LL-2 CAMERA & LENS IN</u>	<u>18</u>	<u>E</u>	<u>5400</u>	<u>3.00</u>		<u>97200</u>			<u>54</u>		
	<u>WP HOUSING</u>											
	<u>WP PULL BOXES 6X6</u>	<u>12</u>	<u>E</u>	<u>5.25</u>	<u>1.00</u>		<u>60</u>			<u>12</u>		
	<u>1 1/2" RGS BELOW GRADE</u>	<u>2700</u>	<u>FT</u>	<u>1.28</u>	<u>.14</u>		<u>3460</u>			<u>378</u>		
	<u>1" RGS BELOW GRADE</u>	<u>8100</u>	<u>FT</u>	<u>.83</u>	<u>.08</u>		<u>6720</u>			<u>648</u>		
	<u>3/4" RGS ON POLES</u>	<u>1250</u>	<u>FT</u>	<u>.62</u>	<u>.08</u>		<u>780</u>			<u>100</u>		
	<u>3/4" SUPPORTS</u>	<u>150</u>	<u>E</u>	<u>1.26</u>	<u>.24</u>		<u>190</u>			<u>36</u>		
	<u>3/4" FITTINGS (10% OF CND)</u>	<u>1</u>	<u>LS</u>	<u>-</u>	<u>-</u>		<u>80</u>			<u>11</u>		
	<u>COAX RG-11</u>	<u>23000</u>	<u>FT</u>	<u>1.50</u>	<u>.008</u>		<u>34500</u>			<u>184</u>		
	<u>✓ TERMINATIONS</u>	<u>70</u>	<u>E</u>	<u>3.50</u>	<u>.50</u>		<u>250</u>			<u>35</u>		
	<u>40' CL 4 WOOD POLE</u>	<u>10</u>	<u>E</u>	<u>350</u>	<u>4.00</u>		<u>3500</u>			<u>40</u>		
	<u>DIG & BACKFILL</u>	<u>10</u>	<u>E</u>	<u>-</u>	<u>3.00</u>		<u>-</u>			<u>30</u>		
	<u>14" B+W MONITOR COMU</u>	<u>2</u>	<u>E</u>	<u>835</u>	<u>3.00</u>		<u>1670</u>			<u>6</u>		
	<u>SEQUENTIAL SWITCHER PELCO</u>	<u>1</u>	<u>E</u>	<u>1300</u>	<u>4.00</u>		<u>1300</u>			<u>4</u>		
	<u>VIDEO & PULSE AMP & DEMODULATOR</u>	<u>1</u>	<u>LS</u>				<u>18000</u>			<u>8</u>		
	<u>WP CONTROL TX 250VA 480-120</u>	<u>18</u>	<u>E</u>	<u>55.00</u>	<u>2.00</u>		<u>990</u>			<u>36</u>		
	<u>#8 AWG 600V</u>	<u>7500</u>	<u>FT</u>	<u>.131</u>	<u>.011</u>		<u>980</u>			<u>83</u>		
	<u>Q A LIVER II</u>						<u>169680</u>			<u>1665</u>		

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

CES-4903-0

DATE _____

SHEET 1 OF 2

MTO BY _____
PRICED BY _____

JOB NO.: <u>5872-1</u>		CLIENT: <u>DOE</u>		TYPE OF ESTIMATE:				CHECKED BY: <u>LW</u>				
PROJECT: <u>OAKRIDGE NATIONAL LAB. - TENN.</u>		Qty	Unit	Cost/Unit			Materials & Expense	Subcontract		Labor		Total Dollars
Acct. No.				Matl	Hr	Labor \$		Hours	Dollars	Hours	Dollars	
7000	UTILITIES - SUMMARY											
	CONCRETE WORK						4 596 500			539 656		
	MOISTURE PROTECTION						42 900			2730		
	PAINTING						700			152		
	RAILROAD						150 000			5000		
	SUB-TOTAL PRODUCTIVITY	80	%				4790 100			597 538 149 384		
	TOTAL, 7000 - FFP					13.46	4 790 100			746 922	10 053 600	14 843 700

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

M.T.O. BY ZIGGY Z		PRICED BY 4P		DATE JUL '79		SHEET 2 OF 2						
JOB NO.: 5872-1		CLIENT: DOE		TYPE OF ESTIMATE: PRE-CONCEPT		CKD BY: LV						
UNIT/AREA	DESCRIPTION	QUANTITY	UNIT	COST OR M/HR PER UNIT			MATERIAL EXPENSE	SUBCONTRACT		LABOR		TOTAL DOLLARS
CAPACITY				MATL	M/H	LAB \$		M/HFS	DOLLARS	M/HR	DOLLARS	
ACCNT												
7000	UTILITIES											
	CONCRETE WORK											
	UTILITY TUNNEL- CONCRETE	411	CY	198	30		81 400				12 330	
	- EXCAVATION	2778	/	-	.10		-				278	
	- BACKFILL - EARTH	1260	/	-	.16		-				202	
	- GRAVEL	1000	/	9.-	.20		9 000				200	
	- 6" Ø V.C. PIPE	680	LF	2.-	.12		1 400				82	
	- REBAR 270# x 411 CY	55	TM	400	20		22 000	113 800			1100	14 192
	TRANSFER TUNNEL- CONCRETE	17333	CY	198	30		3 431 900				519 990	
	- EXCAVATION	42 500	/	-	.10		-				4 250	
	- BACKFILL - EARTH	10 100	/	-	.16						1 616	
	- GRAVEL	12 000	/	9.-	.20		108 000				2 400	
	- 6" Ø V.C. PIPE	3 400	LF	2.-	.12		6 800				408	
	- REBAR 270 # x 17333 CY	2340	TM	400.	20.-		936 000	4482 700			46800	575 464
	TOTAL CONC.	17744	CY	259.-	33.23		4 596 500				589 656	
	MOISTURE PROTECTION											
	WATERPROOF MEMBRANE	78 000	SF	.20	.03		15 600				2340	
	CELOTEX BD. PROTECTION - 1/2" TK	78 000	/	.35	.005		27 300				390	
	TOTAL, MOISTURE PROTECTION						42 900				2730	
	PAINTING - UTILITY TUNNEL, ARCH'L	6 900	SF	.10	.022		700				152	

THE RALPH M. PARSONS COMPANY

ESTIMATE WORKSHEET

[illegible]

TITLE P.T. CASK - Lost Estimate Calculations SHEET NO. 1 OF 1

JOB NO. 5872-1 DEPARTMENT MECH. AUTHOR SVH/H DATE 8-28-79

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

- 1) ADD BOTTOM AND COVER WITH SAME THICKNESS AS SIDES
- 2) ADD 38 CM TO 366 CM LENGTH TO PROVIDE SPACE FOR MECH. EQUIP.

1. MATERIAL COSTS

A. 304 STAINLESS STEEL

1) 5 CM 304 S.S. OUTER SHELL

$$WT\ CYL = Vol \cdot Density = \frac{\pi}{4} (D_o^2 - D_i^2) L$$

$$L = length = 539\ cm$$

$$d = density = 0.292\ lb/in^3$$

$$D_o = 265\ cm$$

$$D_i = 255\ cm$$

$$WT\ CYL = \frac{\pi}{4} (265^2 - 255^2) (539) \frac{cm^3}{16.4\ cm^3} \cdot \frac{0.292\ #}{173} = 39,160\ #$$

PLUS ESTIMATED WT. FLANGES AND RIVETS 6,000 #

$$PLUS\ WT.\ END\ PLATES = 2 \times 5\ cm \cdot A, d\ L = 265\ cm$$

$$= 2 \times 5 \cdot \frac{\pi}{4} (265 - 10)^2 \cdot 0.292 = 9,090\ #$$

TOTAL 54,260 #

$$lost\ (at\ 100/16) = 54,260\ # \cdot 100/16 = \$54,260$$

PLUS PACKAGING & SHIPPING -- 2500

TOTAL \$56,760

TITLE P.T. CASK - Cost Estimate Calculations SHEET NO. 2 OF

JOB NO. SB72-1 DEPARTMENT MECH AUTHOR SWH DATE

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

1 - MATERIAL COSTS: 1A 304 SS PLATE (CONTINUED)

2) 2.5 CM SS PLATE

$$WT. CYL = AREA \times 42.665 \text{ lbs/ft}^2$$

$$= \pi \times DIA. \times LENGTH \times 42.665 \text{ lbs/ft}^2$$

$$= \pi \times 2510 \text{ cm} \times (539 \text{ cm} - 2(27.5 \text{ cm}) \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{144 \text{ in}^2} \times 42.665 \text{ lbs/ft}^2$$

$$= \frac{3.14 \times 2510 \times 484}{2.54^2 \times 144} \times 42.665 = 14,660 \text{ #}$$

$$WT. TOP \& BOTTOM = 2 \times \frac{\pi}{4} \left(\frac{265 - 2 \times 30}{4} \right)^2 \times \frac{42.665}{2.54^2 \times 144} = \frac{3,030}{17,690} \text{ #}$$

$$\text{Cost @ } 1^{\circ}/\text{#} = \$17,690$$

$$\text{PLUS PACKAGING \& SHIPPING} = 1,000$$

$$\$18,690$$

3) 5.0 CM SS PLATE

$$WT. CYL = AREA \times 84 \text{ lbs/ft}^2$$

$$= CIRCUMFERENCE \times LENGTH \times 84 \text{ #/ft}^2$$

$$D = 140 \text{ cm} \quad D = 539 - 2 \times 62.5 = 414 \text{ cm}$$

$$= \pi \times 140 \text{ cm} \times 414 \text{ cm} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{144 \text{ in}^2} \times 84 \text{ #/ft}^2$$

$$= \frac{3.14 \times 140 \times 414 \times 84}{2.54^2 \times 144} = 16,460 \text{ #}$$

$$WT. TOP \& BOTTOM = 2 \times \frac{\pi}{4} \left(\frac{265 - 2 \times 65}{4} \right)^2 \times \frac{84}{2.54^2 \times 144} = \frac{2,590}{19,050} \text{ #}$$

$$\text{TOTAL WT} = 19,050$$

$$\text{Cost @ } 1^{\circ}/\text{#} = \$19,050$$

$$\text{PLUS PACKAGING \& SHIPPING} = 1,000$$

$$20,050$$

TOTAL 304 SS COSTS:

$$\text{OUTER SHELL} = \$5,6760$$

$$2.5 \text{ CM PLATE} = 18,690$$

$$5.0 \text{ CM PLATE} = 20,050$$

$$95,500$$

$$\text{USE } 96,000$$

- 244 -

TITLE PT CASK - Cost Est. Calculations SHEET NO. 3 OF
 JOB NO. 5872-1 DEPARTMENT MECH. AUTHOR S.W.H. DATE

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

1. MATERIAL COSTS (CONTINUED)

B, ALUMINUM FUEL BASKET (6061-T6)

$$WT = VOL. \times DENSITY = \frac{\pi}{4} D^2 L d$$

$$D = DIA. = 130 CM$$

$$L = LENGTH = 404 CM$$

$$d = DENSITY = 0.0975 \#/in^3$$

$$WT = \frac{\pi}{4} \times \frac{130^2}{2.54^2} \times \frac{404}{2.54} \times 0.0975 = 31,905 \#$$

$$PLUS MFG LOSSES (15\%) \quad 4,785$$

$$TOTAL \quad 36,690 \#$$

$$Cost @ 1.75/\# = 36,690 \times 1.75 = \$ 64,210$$

$$PLUS PACKAGING AND SHIPPING \quad 2,500$$

$$NET WT = 31,905 \times .70 = 22,330 \#$$

$$TOTAL \$ 66,710$$

$$USE 67,000$$

C. COPPER COOLING FINS IN LIH

$$ESTIMATE 2200 \# @ \frac{3.79}{\#} = \$ 8,340$$

$$PLUS PACKAGING & SHIPPING (10\%) \quad 840$$

$$TOTAL 9,180$$

$$USE 10,000$$

2. SUB-ASSEMBLY COSTS

A, BORON CARBIDE

$$WT. CYL = VOL. \times DENSITY = (A_2 - A_1) L \times d = \frac{\pi}{4} (D_2^2 - D_1^2) L d$$

$$L = LENGTH = 539 - 2 \times 5 = 529$$

$$D_2 = 255 CM$$

$$D_1 = 210 CM \quad d = 0.0916 \#/in^3$$

$$WT. CYL = \frac{\pi}{4} (255^2 - 210^2) \times 529 \times \frac{16.4 cm^2}{1 in^2} \times 0.0916 \#/in^3 = 48,560$$

TITLE PT CASK - COST EST. CALCULATIONS SHEET NO. 4 OF
 JOB NO. 5872-1 DEPARTMENT Mech AUTHOR SHH DATE

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

2. SUB-ASSEMBLY COSTS (CONTINUED)

A. BORON CARBIDE (CONTINUED)

$$\begin{aligned} \text{WT TOP \& BOTTOM} &= 2 \times \text{AREA} \times \text{THICKNESS} \times \text{DENSITY} \quad A = \frac{\pi}{4} (26.5 - 2 \times 27.5)^2 \\ &= 2 \times \frac{\pi}{4} \cdot 210^2 \text{ cm}^2 (127.5 - 105) \text{ cm} \cdot \frac{1 \text{ in}^3}{16.4 \text{ cm}^3} \cdot 0.0916 \frac{\#}{\text{in}^3} \\ &= 8,710 \text{ lbs} \end{aligned}$$

$$\begin{aligned} \text{TOTAL WT B}_4\text{C} &= 48,560 \# + 8,710 \# = 57,270 \# \\ \text{PLUS BREAKAGE AND LOSSES (10\%)} & \quad 5,730 \end{aligned}$$

$$63,000 \#$$

COST @ 20¢/lb FIRED INTO BRICKS BUT NOT INCLUDING PATTERNS

$$\begin{aligned} \text{COST} &= 63,000 \# \times 20 \frac{\text{¢}}{\text{lb}} = \text{---} 1,260,000 \\ \text{PLUS PACKAGING (2\%)} & \quad 25,200 \\ \text{PLUS SHIPPING} & \quad 2,000 \\ & \quad \underline{1,287,200} \end{aligned}$$

B. LITHIUM HYDRIDE

$$\text{WT CYLINDERS} = \frac{\pi}{4} (D_2^2 - D_1^2) L \cdot d$$

$$D_2 = 20.5 \text{ cm}$$

$$D_1 = 167.6 \text{ cm}$$

$$L = 539.230 = 479 \text{ cm}$$

$$d = 0.028 \frac{\#}{\text{in}^3}$$

$$= \frac{\pi}{4} (20.5^2 - 167.6^2) \cdot 479 \text{ cm}^2 \cdot \frac{1 \text{ in}^3}{16.4 \text{ cm}^3} \cdot 0.028 \frac{\#}{\text{in}^3} = 9000 \#$$

$$\text{WT. TOP \& BOTTOM} = 2 \times \frac{\pi}{4} D_2^2 \times \text{THICKNESS} \times d =$$

$$= 2 \times \frac{\pi}{4} \cdot 167.6^2 \cdot 18.7 \text{ cm}^2 \cdot \frac{1 \text{ in}^3}{16.4 \text{ cm}^3} \cdot 0.028 \frac{\#}{\text{in}^3} = 1410 \#$$

$$\begin{aligned} \text{WT CYLINDER + TOP \& BOTTOM} &= 9000 + 1410 = 10,400 \\ \text{PLUS LOSS \& SPOILAGE (15\%)} & \quad 1,600 \end{aligned}$$

$$12,000$$

$$\begin{aligned} \text{COST AT } 46 \frac{\text{¢}}{\text{lb}} &= 12,000 \times 46 = \$ 552,000 \\ \text{PLUS PACKAGING} & \quad 22,000 \\ \text{PLUS SHIPPING} & \quad 1,200 \end{aligned}$$

$$- 246 -$$

$$575,200$$

TITLE PT CASK - COST ESTIMATE CALCULATIONS SHEET NO. 5 OF
 JOB NO. 5B72-1 DEPARTMENT MECH AUTHOR SWH DATE

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

2. SUB-ASSEMBLY COSTS (CONTINUED)

B. LITHIUM HYDRIDE (CONTINUED)

COST LiH INCLUDING SHIP & PACKAGE \$575,200

PLUS SS ENCAPSULATION (3000#)

1B GAGE 304 SS @ 8⁵⁰/16 L & M

$$3000 \times 8.50 = \text{---} \text{---} \text{---} 25,500$$

TOTAL 600,700

USE 610,000

C. DEPLETED URANIUM

$$\text{INT. CYLINDER} = \text{VOL} \times \text{DENSITY} = \frac{\pi}{4} (D_2^2 - D_1^2) \cdot L \cdot d$$

$$D_2 = 167.6 \text{ cm} \quad L = 539 \text{ cm} \cdot 2 = 48.7 \text{ cm} = 441.6 \text{ cm}$$

$$D_1 = 160 \text{ cm} \quad d = 0.6753 \text{ #/in}^3$$

$$\text{INT CYL} = \frac{\pi}{4} (167.6^2 - 160^2) \times 441.6 \times \frac{17}{16.4 \text{ cm}^3} \cdot \frac{0.6753 \text{ #}}{17.3}$$

$$= \frac{\pi}{4} \times 2490 \times 441.6 \times 0.6753 = \text{---} \text{---} 35,540 \text{ #}$$

$$\text{INT TOP \& BOTTOM} \quad D_1 = 265 - 2 \times 52.5 = 160 \text{ cm}$$

$$= 2 \times \frac{\pi}{4} D_1^2 \times \text{THICKNESS}$$

$$= 2 \times \frac{\pi}{4} \cdot 160^2 \cdot 3.8 \times \frac{17}{16.4 \text{ cm}^3} \cdot \frac{0.6753 \text{ #}}{17.3} = 6,330 \text{ #}$$

TOTAL 41,890 #

COST @ 20⁰⁰/16 (MACHINED)

$$= 41,890 \text{ lbs} \times 20 \frac{00}{16} = \$837,800$$

PLUS PACKAGING (2%) -- 16,800

PLUS SHIP @ 3⁰⁰/CWT --- 1,500

TOTAL \$856,100

USE 860,000

TITLE PT CASK - COST ESTIMATE CALCULATIONS SHEET NO. 6 OF
 JOB NO. 5872-1 DEPARTMENT MECH AUTHOR SHH DATE

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

2. SUB ASSEMBLY COSTS (CONTINUED)

D. BORON CARBIDE (70%) WITH COPPER (30%)

$$WT. CYLINDER = Vol \cdot Density = \frac{\pi}{4} (D_2^2 - D_1^2) L \cdot d_m$$

$$D_2 = OD = 160 \text{ cm}$$

$$D_1 = ID = 140 \text{ cm}$$

$$L = \text{length cyl} = 539 \text{ cm} \cdot 2 / (132.5 - 80) \text{ cm} = 434 \text{ cm}$$

$$d_m = \text{density of mixture} = (0.7 \cdot 0.0916 + 0.3 \cdot 0.321) \frac{\#}{\text{in}^3}$$

$$= 0.064 + 0.096 = 0.16 \frac{\#}{\text{in}^3}$$

$$WT. CYL = \frac{\pi}{4} (160^2 - 140^2) \text{ cm}^2 \cdot 434 \text{ cm} \cdot \frac{1 \text{ in}^3}{16.4 \text{ cm}^3} \cdot 0.16 \frac{\#}{\text{in}^3}$$

$$= \frac{1,7854 \cdot 6000 \cdot 434 \cdot 0.16}{16.4} = \text{---} = 19,960 \#$$

WT TOP & BOTTOM

$$= 2 \cdot \frac{\pi}{4} \cdot 140^2 \text{ cm}^2 \cdot 10 \text{ cm} \cdot \frac{1 \text{ in}^3}{16.4 \text{ cm}^3} \cdot 0.16 \frac{\#}{\text{in}^3} = 3,000 \#$$

$$\text{SUB TOTAL} \quad 22,960 \#$$

$$\text{PLUS SPILLAGE (10\%)} \quad 2300$$

$$\text{TOTAL} \quad 25,260 \#$$

LOST @ 20%/# FORMED INTO BRICKS BUT LESS CONTAINERS

$$\text{LOST} = 25,260 \# \cdot 20\%/\# = \$ 505,200$$

$$\text{PLUS PACKAGING (2\%)} \quad 10,100$$

$$\text{PLUS SHIPPING @ 2\$/CWT} \quad 700$$

$$\text{PLUS 3000\# 18 GAGE 304} \quad 25,500$$

55 CONTAINERS @

85¢/16 LABOR & MATL

$$\text{TOTAL} \quad \$ 541,500$$

$$\text{USE } 550,000$$

TITLE PT CASK - COST ESTIMATE CALCULATIONS SHEET NO. 7 OF JOB NO. DEPARTMENT AUTHOR DATE

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

3. MANUFACTURING COSTSA. MATERIAL FABRICATION (INCLUDES MAIN VESSEL AND ALL OTHER PARTS NOT FURNISHED BY VENDOR)

COST = NO. HOURS * RATE

RATE = 35⁰⁰/HR

ESTIMATED NO. OF HOURS = 14,000

MTRL FAB. COST = 14,000 HRS * 35⁰⁰/HR = \$ 525,000 / UNITB. ASSEMBLY (VENDOR PARTS ASSEMBLED INTO VESSEL SHELL)

ESTIMATED MAN HOURS = 3000

COST = 3000 HRS * 35⁰⁰/HR = \$ 105,000 / UNITUSE 100,0004. DESIGN, LICENSE & TEST COSTSA. DESIGN

ESTIMATED MAN HOURS - 12,000

COST = 12,000 HRS * 35⁰⁰/HR = \$ 420,000 (TOTAL)

COST/UNIT (AMORTIZED OVER 25 UNITS)

DES. COST/UNIT = $\frac{420,000}{25} = \$ 16,800 / \text{UNIT}$
USE 20,000B. TEST, REDESIGN & REBUILD FOR DOT LICENSE

ESTIMATED COST \$1,000,000 (TOTAL)

COST/UNIT (AMORTIZED OVER 25 UNITS) = $\frac{1,000,000}{25} = \$ 40,000 / \text{UNIT}$

PLUS COSTS OF LICENSING

20,000/UNIT

SUB TOTAL \$ 60,000 / UNIT

TOTAL DESIGN, LICENSE & TEST = 60K + 20K = \$ 80,000 / UNIT

TITLE PT CASK - COST ESTIMATE CALCULATIONS SHEET NO. 8 OF
 JOB NO. 5872-1 DEPARTMENT MELN AUTHOR SWH DATE

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

5. TOOLING AND SET-UP (INCLUDES DESIGN AND FABRICATION)

ESTIMATED MAN-HOURS - 4000

$$\text{COST} = 4000 \text{ HRS} \times 35\%/\text{HR} = \$140,000 \text{ (TOTAL)}$$

$$\text{COST/UNIT (AMORTIZED OVER 25 UNITS)} = \frac{140,000}{25} = \$5,600/\text{UNIT}$$

$1/3 = \$6000/\text{UNIT}$

6. RAIL CAR - (ONE CAR TO BE PROVIDED FOR EACH CASK)

ESTIMATED COST -- \$175,000

COST SUMMARY

1. MATERIALS

304 STAINLESS STEEL	---	96,000
6061-T6 ALUMINUM		67,000
COPPER COOLING FINS		10,000
MISCELLANEOUS		<u>11,000</u>

184,000

2. SUB ASSEMBLIES

BORON CARBIDE	1,290,000
LITHIUM HYDRIDE	610,000
DEPLETED URANIUM	860,000
BORON CARBIDE W/ COPPER	<u>550,000</u>

3,310,000

TOTAL MATERIALS AND SUBASSEMBLIES

3,494,000

3. MANUFACTURING

MATERIAL FABRICATION	525,000
ASSEMBLY	<u>105,000</u>

630,000

SUB TOTAL

4,124,000

4. DESIGN, LICENSE AND TEST (1/25 OF COST)

80,000

5. TOOLING AND SET-UP (1/25 OF COST)

6,000

6. RAILCAR

175,000

- 250 -

COST/UNIT 4,385,000

TITLE PT CASK - Cost Estimate Calculation SHEET NO. 9 OF 9

JOB NO. _____ DEPARTMENT _____ AUTHOR _____ DATE _____

REV	CHECKER	DATE	REV	CHECKER	DATE	REV	CHECKER	DATE

Cost Summary (Continued)

Cost/UNIT ----- 4,385,000
PLUS Quality Assurance (20%) 877,000
SUBTOTAL 5,262,000
PLUS OVERHEAD AND PROFIT (25%) 1,316,000
TOTAL Cost/UNIT \$6,578,000

Net Weight Summary

lbs.
304 SS 91,000
ALUMINUM BASKET 22,300
COPPER FINIS 2,200
BORON CARBIDE 57,270
LITHIUM HYDRIDE 10,400 (INCLUDING SS ENCAPSULATION)
DEPLETED URANIUM 41,890
BORON CARBIDE @ COPPER 22,960 (INCLUDING SS ENCAPSULATION)
26800.0 lbs

INTERNAL DISTRIBUTION

- 1-10. J. O. Blomeke
- 11. A. G. Croff
- 12. B. C. Finney
- 13. Central Research Library
- 14. ORNL Patent Section
- 15. Laboratory Records
- 16. Laboratory Records, RC
- 17. ORNL Y-12 Technical Library,
Document Reference Section

EXTERNAL DISTRIBUTION

Science Applications, Inc., 5 Palo Alto Square, Suite 200,
Palo Alto, CA 94304

- 18. R. R. Fullwood

Los Alamos Technical Associates, P.O. Box 410, 1553 Myrtle St.,
Los Alamos, NM 87544

- 19. S. E. Logan

Ralph M. Parsons Company, Power Division, 100 Walnut St.,
Pasadena, CA 91124

- 20-24. A. E. Smith

Georgia Institute of Technology, Atlanta, GA 30332

- 25. D. W. Tedder

DOE-SRO, P.O. Box A, Aiken, SC 29801

- 26. T. B. Hindman

DOE-HQ, Washington, DC 20545

- 27. R. D. Walton

DOE-ORO, Oak Ridge, TN 37830

- 28. Office of Asst. Manager for Energy Research and Development

29-30. Technical Information Center, Oak Ridge, TN 37830