LIBRARY COPY

Department of Energy
Los Alamos Area Office
Albuquerque Operations Office
Los Alamos, New Mexico 87544

APR 08 1994

0227 FFCO

Mr. Joel Dougherty
Hazardous Waste Management Division
RCRA Enforcement Branch (ALONM)
Environmental Protection Agency, Region 6
1445 Ross Ave., Suite 1200
Dallas, TX 75202-2733

ENTERED

Dear Mr. Dougherty:

This letter transmits the final versions of the Los Alamos National Laboratory (LANL) deliverables and reports prepared in response to the following milestones:

AR 100	Annual Report
ATS 100	Program Management Plan for Generic Development, Design, Permitting, Construction, and Operation of Low-Level Mixed Waste (LLMW) Treatment Skids
GAS 100	Gas Cylinder Work-Off Plan
IFLL 100	Preconceptual Study to Identify Required LLMW Storage Upgrades
HLL 100	Characterization Plan for Historical LLMW
OSS 100	Feasibility of Diversified Scientific Services, Inc., Treatment
WM 100	Waste Minimization Plan
WM 200	Waste Minimization Annual Work Plan

The Department of Energy's (DOE) submittal of these documents to the Environmental Protection Agency (EPA) is required to ensure compliance with the Federal Facilities Compliance Agreement (FFCA). This FFCA has just been signed addressing hazardous and radioactive mixed wastes pursuant to the Resource Conservation and Recovery Act. The FFCA specified a due date for compliance with the referenced milestones within 30 days of the signature date (April 14, 1994).

We have prepared these documents to be consistent as possible in appearance and format. It is our expectation that this format would be used for all future deliverables, notices and reports prepared pursuant to the FFCA. Please advise us as to whether this format is acceptable or whether changes are desired.

1700

An initial Annual Report was prepared and submitted herewith (AR 100). While it complies with the FFCA Appendix B requirements by providing information on the current status of implementation of waste minimization efforts (WM 100), treatment skid development, design, and construction (ATS 100), and the availability/applicability of off-site treatment capacity for low-level mixed wastes (OSS 100), it also provides discussion on

APR 08 1994

the status of all other FFCA milestones, as well as an explanation of the interrelationships among milestones. It is our expectation that this format would be used for all future annual reports.

Additionally, as you have discussed with my staff, changes and updates to the waste inventory information in the FFCA Appendix B enclosures which have occurred since their development will be included in the AR 100 report. Thereafter, the inventory information will be updated and reported to you annually in the AR 100 report, and modifications to the FFCA will be made, if necessary.

Notifications of the completion of milestones HW 100, HW 300, LD 100, and CAI 100 are being sent to you concurrently under separate cover.

Supporting documentation will be retained in DOE and LANL files to support the FFCA, and will be made available to EPA and the State of New Mexico upon request. If you have any questions regarding this activity, please contact Jon Mack of my staff at (505) 665-5026.

Sincerely,

Joseph C. Vozella

Joseph C. Vozella, Chief
Environment, Safety, and Health
Branch

LESH:7JM-114

Enclosures

cc w/enclosures:
B. Garcia, Bureau Chief
Hazardous & Radioactive
Materials Bureau
NMED
525 Camino de los Marquez
Santa Fe, NM 87502
P. Siebach, EM-323, HQ
J. Mack, ES&H, LAAO
R. Nevarez, WMD, AL

cc w/o enclosure:
J. Laeser, Counsel, LAAO
J. Vozella, ES&H, LAAO
A. Gancarz, CST-DO, LANL, MS-J515
A. Drypolcher, CST-7, LANL, MS-E517
P. Schumann, CST-7, LANL, MS-E539
D. Erickson, ESH-DO, LANL, MS-K491
K. Hargis, EM-8, LANL, MS-K490
J. Corpion, ESH-8, LANL, MS-K498
T. Baca, EM, LANL, MS-J591

0227 FFCO 1792

ATS 100
PROGRAM MANAGEMENT PLAN
FOR GENERIC SKID DESIGN

Final

Submitted in partial fulfillment of the
requirements of the Federal Facility
Compliance Agreement addressing hazardous
and mixed waste under the Resource
Conservation and Recovery Act

Los Alamos Area Office
U. S. Department of Energy
528 35th Street
Los Alamos, New Mexico 87544

Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, New Mexico 87545

PREFACE

This *Program Management Plan for Generic Skid Design* is being submitted to the United States Environmental Protection Agency (EPA) by the Department of Energy (DOE) and Los Alamos National Laboratory (LANL) in fulfillment of DOE's commitment to EPA under the Federal Facility Compliance Agreement (FFCA) developed pursuant to the Land Disposal Restrictions (LDR) requirements of the Resource Conservation and Recovery Act (RCRA), as promulgated in 40 CFR Part 268. This Program Management Plan for Generic Skid Design is provided as a deliverable in compliance with Milestone ATS 100 in Appendix B of the FFCA.

The purpose of this Program Management Plan for Generic Skid Design is to document the methodology for the development of skid treatment technologies and equipment. The plan incudes the total effort from waste characterization through construction, permitting, and operation.

The following table discuss the LDR FFCA milestones that relate to ATS 100 and the nature of that interrelationship.

PRIMARY MILESTONE	RELATED MILESTONE	NATURE OF INTERRELATIONSHIP
ATS 100	HLL 100	The program management plan for the low-level mixed waste (LLMW) treatment skids will address developing additional information from the waste characterization plan that will probably be applicable to the development of future treatment skids.
	HLL 200	The program management plan for the LLMW treatment skids will address developing additional information from the formal plan for prioritizing LLMW treatment that will probably be applicable to the development of future treatment skids.
	HW 100	The program management plan for the LLMW treatment skids will provide information necessary for completing the Preliminary Design Summary Report (Title I) for the Harardous Waste Treatment Facility (HWTF).
	HW 200	The program management plan for the LLMW treatment skids will provide information necessary for completing the definitive design (Title II).
	HW 300	The program management plan for the LLMW treatment skids will provide information for the RCRA Mixed Waste (MW) permit application .
	HW 400	The program management plan for the LLMW treatment skids will provide information for the timeline for completing the HWTF.
	HW 500	The program management plan for the LLMW treatment skids will provide information to be used in the construction of the HWTF.
	HW 600	The program management plan for the LLMW treatment skids will provide information for the LLMW work-off plan for the HWTF.

PRIMARY MILESTONE	RELATED MILESTONE	NATURE OF INTERRELATIONSHIP
	HW 700	The program management plan for the LLMW treatment skids will provide information for the construction of the HWTF.
	HW 800	The program management plan for the LLMW treatment skids will provide information for the plans for operation of the HWTF.
	HW 900	The program management plan for the LLMW treatment skids will provide information to be used during the implementation of the LLMW work-off plan for the HWTF.

CONTENTS

1.0 INTRODUCTION 1

2.0 NEW SKID DEVELOPMENT 1

2.1 Contingency 2

2.2 Fabrication Costs 2

Appendix A Gantt Charts 3

Appendix B Gantt Chart Support Tables 4

Appendix C Resource Tables 5

Appendix D Cost Estimate For Skid Fabrication: Cost Of Skid Built Entirely Of Stainless Steel 6

Appendix D2 Estimate Summary 7

Appendix D3 Estimate Subdivision Summary 8

Appendix D4 Estimate Detail By Category 9

Appendix E Cost Estimate For Skid Fabrication: Cost Of Skid With The Structure Built Of Stainless Steel And The Major Components And Piping Of Titanium 10

Appendix E2 Estimate Summary 11

Appendix E3 Estimate Subdivision Summary 12

Appendix E4 Estimate Detail By Category 13

LIST OF ACRONYMS

ACIS	Automated Chemical Inventory Systems
AET	Applied Environmental Technologies
ALARA	As Low As Reasonably Achievable
ATLAS	Advanced Testing for Actinide Separations
BAT	Best Available Technology
BDAT	Best Demonstrated Available Technology
BEJ	Best Engineering Judgment
BIF	Boiler and Industrial Furnace
CAI	Controlled-Air Incinerator
CAMs	Continuous Air Monitors
CFC	Chlorinated Solvents
CFR	Code of Federal Regulations
CLS	Analytical Chemistry Group
CWM	Chemical Waste Management, Inc.
CWDR	Chemical Waste Disposal Request
DOE	U.S. Department of Energy
DOE/AL	DOE Albuquerque Operations Office
DOT	Department of Transportation
DSSI	Diversified Scientific Services, Inc.
EPA	U.S. Environmental Protection Agency
ERC	Earth Resources Corporation
ES&H	Environment, Safety, and Health
FERC	Federal Energy Regulatory Commission
FFCA	Federal Facility Compliance Agreement
FY	Fiscal Year
GCP	Gas Cylider Project
GSA	General Services Administration
HEPA	High Efficiency Particulate Air Filter
HSWA	Hazardous and Solid Waste Amendments
HWFP	Hazardous Waste Facility Permit
HWTF	Hazardous Waste Treatment Facility
ICP	Inductively Coupled Plasma
IPC	Industrial Partnership Center
JCI	Johnson Control Incorporated
KOP	Knowledge of Process
LAMPF	Los Alamos Meson Physics Facility
LANL	Los Alamos National Laboratory
LAO	LANL Assessment Office
LDR	Land Disposal Restriction
LLMW	Low-Level Mixed Waste
LLW	Low-Level Radioactive Waste
LP	LANL Procedures
MSDS	Material Safety Data Sheet
MWRSF	Mixed Waste Receiving and Storage Facility
NEPA	National Environmental Policy Act
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NMED	New Mexico Environmental Department
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission

LIST OF ACRONYMS
(Continued)

PPAC	Pollution Prevention Awareness Campaign
PRD	Program Required Document
PTS	Project Tracking System
PWA	Process Waste Assessments
QA	Quality Assurance
QAP	Quality Assurance Plan
RCRA	Resource Conservation and Recovery Act
R&D	Research and Development
R&M	Redistribution and Marketing Center
RES	Rollins Environmental Services
RMMA	Radioactive Material Management Area
RSWD	Radioactive Solid Waste Disposal Record
SOP	Standard Operating Procedure
SSP	Site Specific Plans
SWDA	Solid Waste Disposal Act
TA	Technical Area
TCLP	Toxicity Characteristic Leaching Procedure
TRU	Transuranic
TSCA	Toxic Substance Control Act
TSDF	Treatment, Storage, or Disposal Facility
UBC	Uniform Building Code
UL	Underwriters Laboratories
ULISSES	Uranium Line for Special Separation Sciences
WAC	Waste Acceptance Criteria
WBS	Work Breakdown Structure
WIPP	Waste Isolation Pilot Plant
WMC	Waste Management Coordinator
WMPO	Waste Minimization Program Office
WPF	Waste Profile Form

ATS 100
PROGRAM MANAGEMENT PLAN
FOR GENERIC SKID DESIGN

1.0 INTRODUCTION

The Los Alamos National Laboratory (LANL) has produced many low-level radioactive wastes that contain components defined as hazardous under the RCRA and are therefore defined as low-level mixed waste (LLMW). With few exceptions, the volume of individual waste streams is small but the number of wastes with different characteristics is large. LLMW has been stored at LANL since 1986. LLMW generated in earlier years was not fully characterized before being placed in storage and therefore will require additional characterization to meet RCRA requirements and to allow off-site treatment or to develop on-site treatment. Wastes not handled by off-site facilities or by the existing controlled-air incinerator (CAI) will be treated in the Hazardous Waste Treatment Facility (HWTF). The HWTF provides rooms with utilities and secondary containment in which the processes, mounted on steel frames (skids), are set to campaign the treatment of a waste. When the campaign is complete, the skids are decontaminated and moved into storage, allowing the room to be used for treatment of another waste.

Information developed from FFCA Milestones HLL 100 *Low-Level Mixed Waste Characterization Plan* and HLL 200 *Formal Plan for Prioritizing LLMW Treatment* will be used to predict and develop additional treatment skids.

The program management plan for generic skid design is to provide

- A documented schedule against which the development of treatment skids can be monitored and;
- A documented assessment of resource needs to support securing and managing resources

This program management plan includes the following elements:

- A Gantt chart and supporting table that identifies the tasks, duration of tasks, interdependency of tasks, and cumulative duration of the program

- A resource table that includes manpower and other resources identified by task and;

- Cost estimates for fabricating the most costly skids anticipated

2.0 NEW SKID DEVELOPMENT

The development of two new treatment processes will be started at the first of each fiscal year, beginning in October 1994. Progress on development of skids and treatment processes will be reported in the section on skid development progress in FFCA Milestone AR 100 (Annual Report).

The generic program management plan includes all steps, from waste characterization through testing, needed to turn the skid over to operations for waste treatment. The plan gives the longest time expected.

The generic plan is a template for the specific plan to be created for each treatment process. Individual tasks in the generic plan may be deleted if they are not needed, thereby reducing the overall duration of specific treatment processes. Examples of tasks that might be deleted are

- Waste sampling and analysis if existing waste characterization data is adequate or,

- Design and fabrication of skids if the process selection and bench scale testing indicate that the equipment on an existing skid can handle the process.

2.1 Contingency

Every attempt will be made to use existing demonstrated technologies to treat waste. However, if a demonstrated technology is not found or if bench scale testing shows that a demonstrated technology cannot be safely applied to mixed waste and no alternative is available, research and development efforts that are not part of this plan will be necessary. A new waste stream will be selected for treatment development to replace the rejected waste and progress on the new waste will be planned based on the generic program plan and resources secured for the rejected waste stream. If a task in the program management plan is not needed for a specific treatment project, it will be dropped and the next tasks in sequence will be performed as soon as possible with the resources secured by the overall plan.

Time required for permitting is not under the control of the DOE or LANL. Maintaining the schedule depends largely on the permit writers.

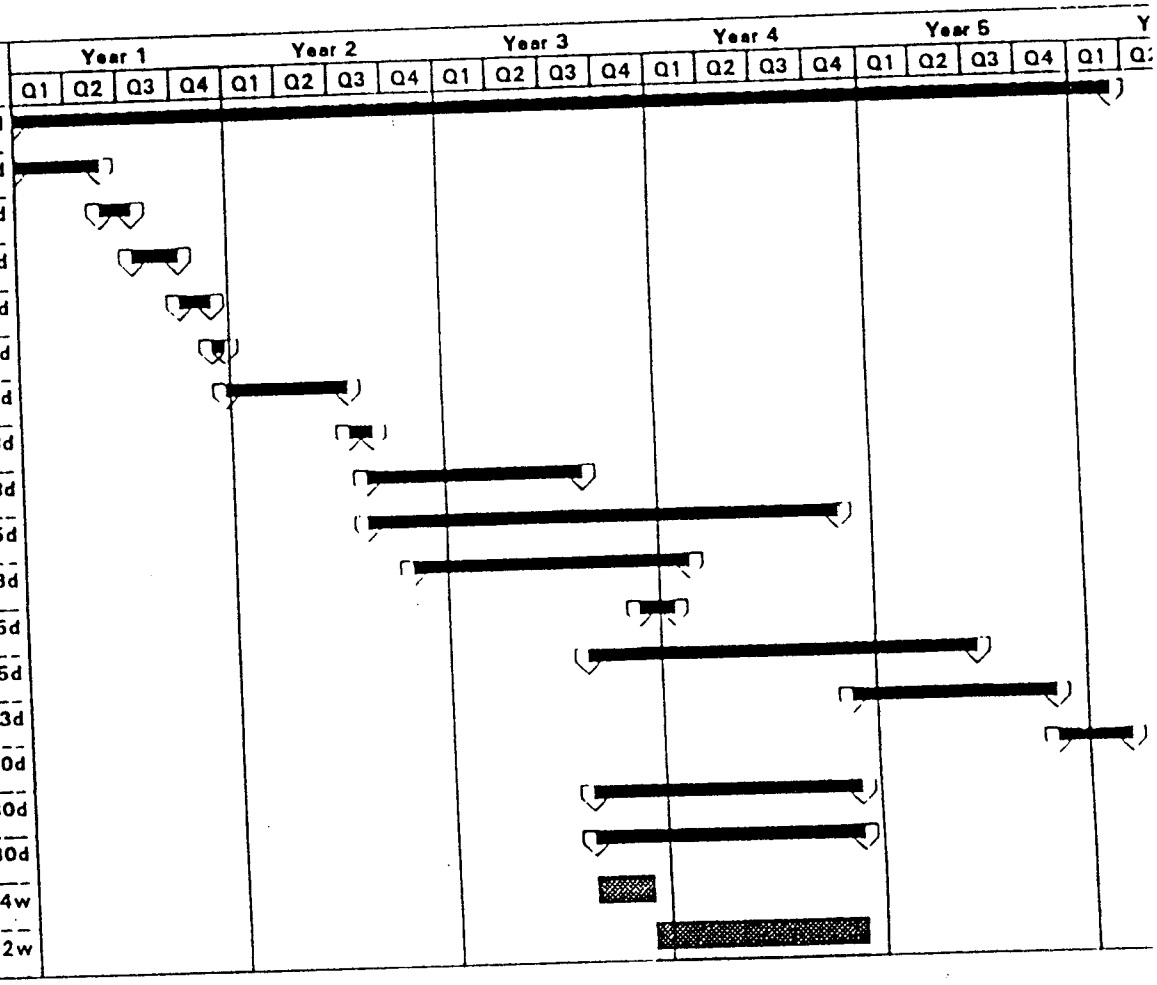
2.2 Fabrication Costs

The cost estimate for fabrication covers two generic skids that are not designed for a specific waste but that contain all the components expected in most skid designs. Skids must be fabricated with capital equipment funds, a special designation of funding that, under current budget practices, must be secured three years before the need for the funding. Most skids are expected to cost less. The fabrication costs in this plan are used to justify the capital equipment budget from which the skids can be fabricated in a timely manner. Funding requests for the current year of activity will be only for funds to replace those spent, so that adequate funding is always maintained.

Appendix A
Gantt Charts

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
1	1 skid mounted treatment process	1356.77d
2	1.1 waste sampling	106d
30	1.2 waste characterization	37.97d
39	1.3 identifying treatment technology	57.3d
53	1.4 process selection	39d
69	1.5 preconceptual design	17d
77	1.6 bench scale testing	149d
100	1.7 title I design (conceptual design)	28d
111	1.8 title II design (final design)	268d
123	1.9 environmental permitting	580.5d
144	1.10 safety documentation	343d
173	1.11 operating documentation	45d
182	1.12 title III (fabrication and construction)	478.5d
198	1.13 cold testing of equipment with modifications	253d
219	1.14 hot testing (with wastes)	90d
238	2 optional steps	330d
239	2.1 NEPA for operation	330d
240	2.1.1 preparation	14w
241	2.1.2 permitting	52w

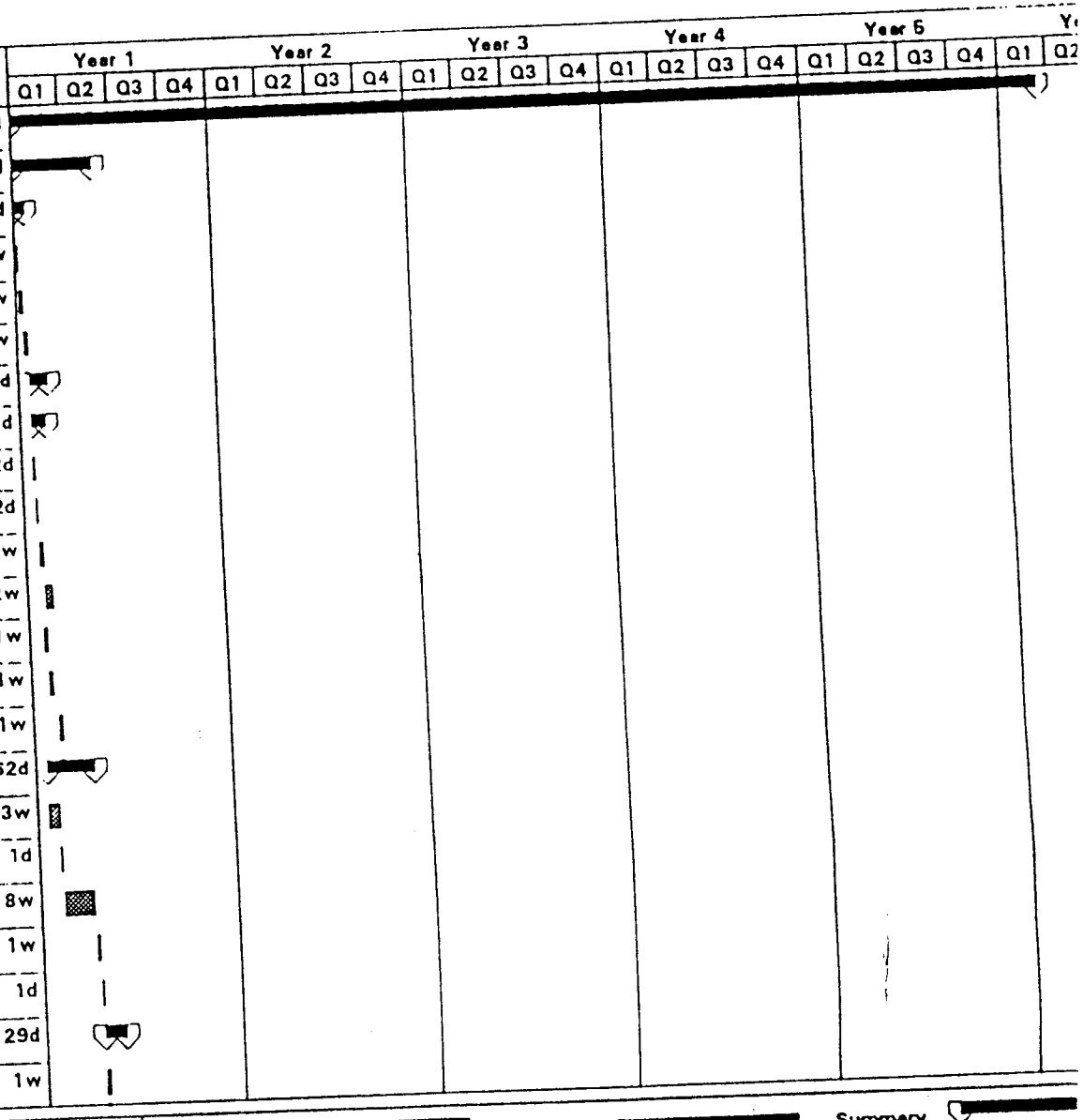


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
1	1 skid mounted treatment process	1355.77d
2	1.1 waste sampling	106d
3	1.1.1 waste investigation	15d
4	1.1.1.1 check waste records	1w
5	1.1.1.2 contact generators	1w
6	1.1.1.3 consolidate information - report	1w
7	1.1.2 sampling plan	24d
8	1.1.2.1 prepare waste analysis plan	19d
9	1.1.2.1.1 determine analytical parameters	2d
10	1.1.2.1.2 identify analytical time limits	2d
11	1.1.2.1.3 locate labs	1w
12	1.1.2.1.4 negotiate schedule	2w
13	1.1.2.2 equipment identification	1w
14	1.1.2.3 write sampling plan	1w
15	1.1.2.4 equipment purchase	1w
16	1.1.3 write safety documents	62d
17	1.1.3.1 prepare documents	3w
18	1.1.3.2 submit for review	1d
19	1.1.3.3 review	8w
20	1.1.3.4 revise for comments	1w
21	1.1.3.5 finalize	1d
22	1.1.4 sampling	29d
23	1.1.4.1 schedule manpower	1w

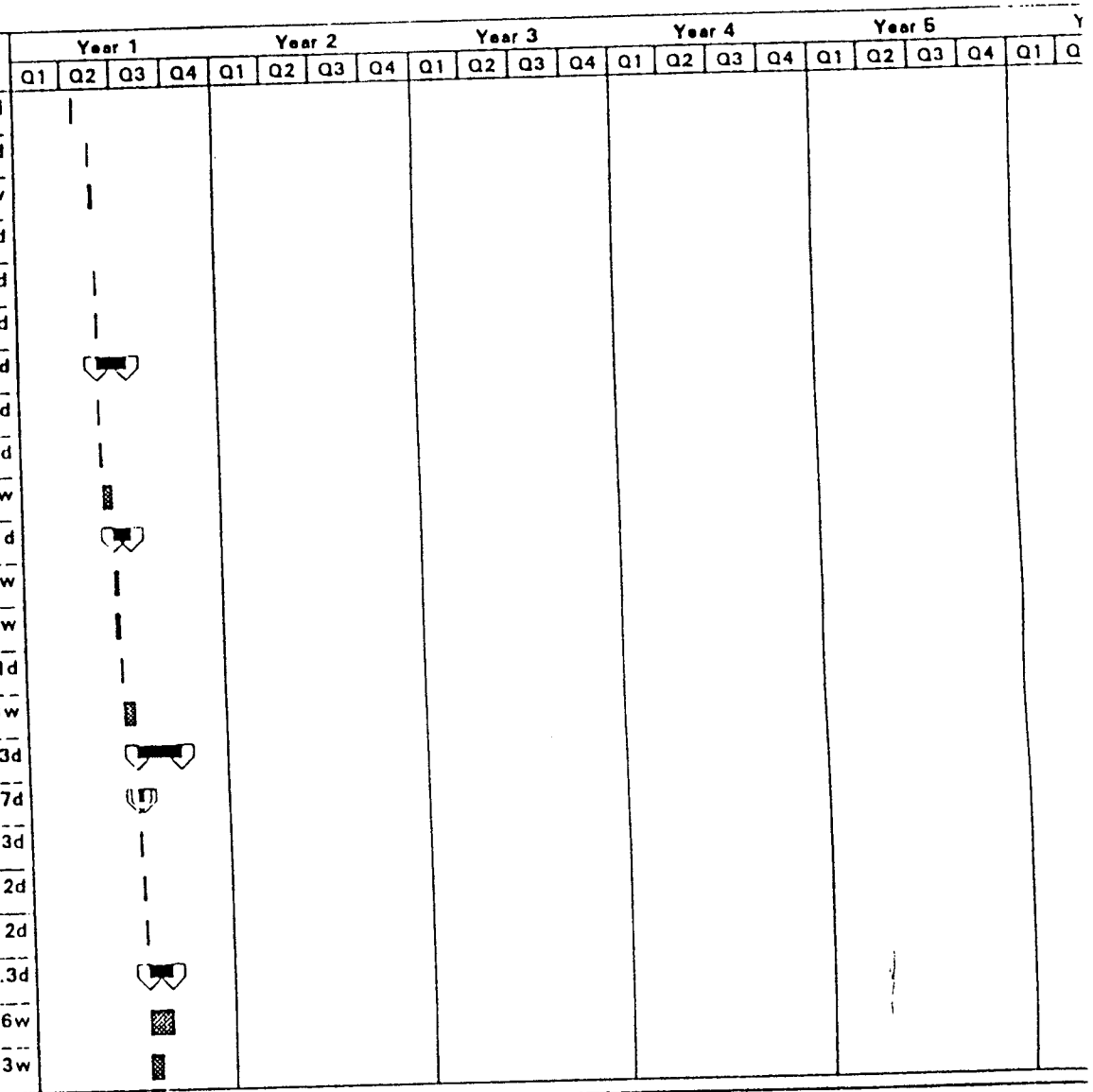


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
24	1.1.4.2 prepare equipment and containers	3d
25	1.1.4.3 sample plan training	1d
26	1.1.4.4 field sampling	1w
27	1.1.4.5 prepare chain of custody documents	1d
28	1.1.4.6 sample documentation	1d
29	1.1.4.7 clean up	3d
30	1.2 waste characterization	37.97d
31	1.2.1 submit samples	2d
32	1.2.2 file documentation	2d
33	1.2.3 analyze samples	2.99w
34	1.2.4 analyze results	21d
35	1.2.4.1 evaluate results	1w
36	1.2.4.2 evaluate QA's	1w
37	1.2.4.3 file analytical documents	1d
38	1.2.4.4 sampling campaign reporting	3w
39	1.3 Identifying treatment technology	57.3d
40	1.3.1 prepare search plan	7d
41	1.3.1.1 review waste sampling results	3d
42	1.3.1.2 categorize results	2d
43	1.3.1.3 outline search plan	2d
44	1.3.2 Literature search	30.3d
45	1.3.2.1 study primary sources	6w
46	1.3.2.2 check references in primary sources	3.03w

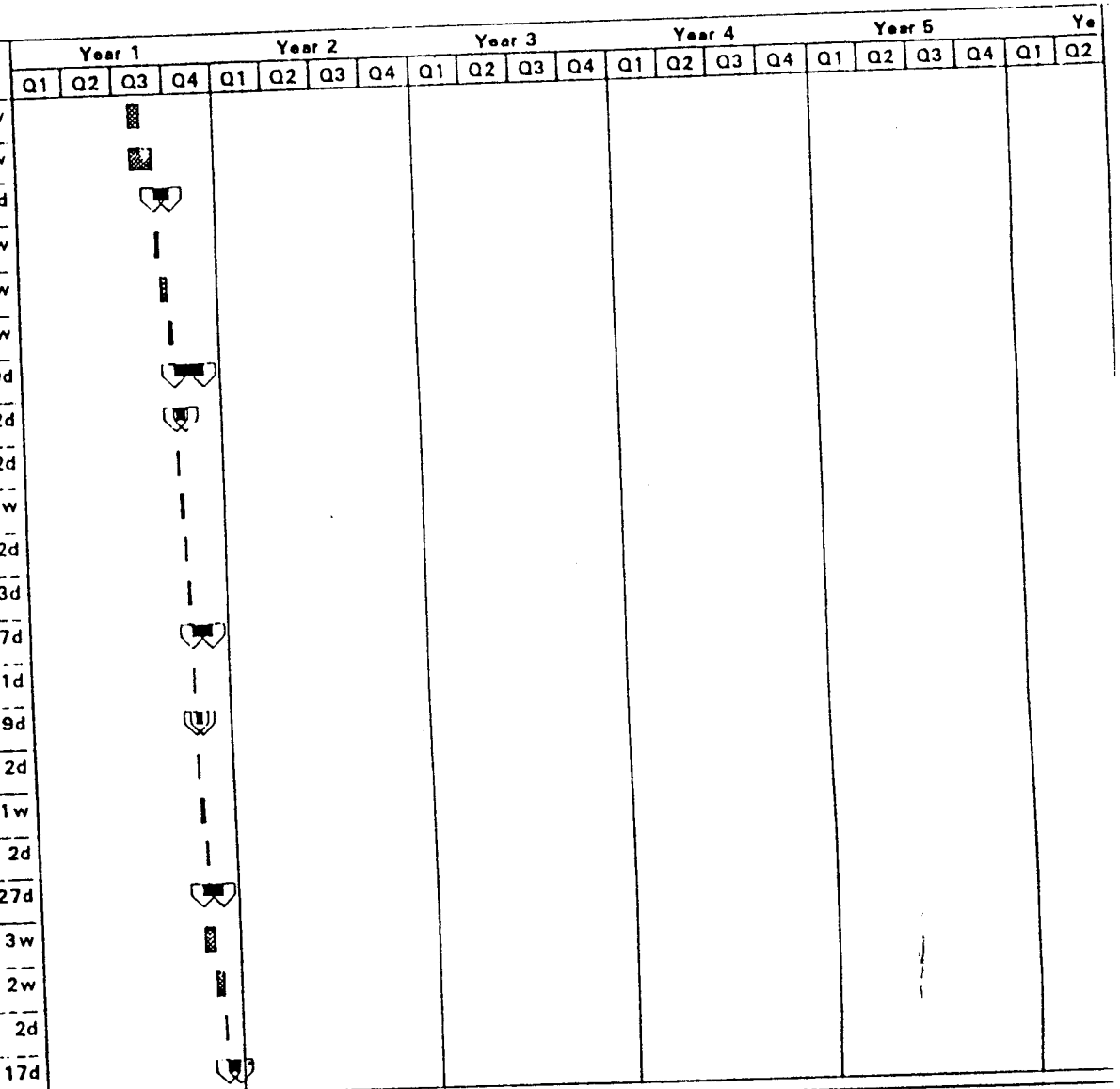


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

	Name	Duration
47	1.3.2.3 contact DOE sources	3.03w
48	1.3.2.4 contact industrial sources	6.06w
49	1.3.3 Results from literature search	20d
50	1.3.3.1 consolidate information	1w
51	1.3.3.2 evaluate results	2w
52	1.3.3.3 document results	1w
53	1.4 process selection	39d
54	1.4.1 process evaluation	12d
55	1.4.1.1 develop evaluation criteria	2d
56	1.4.1.2 perform initial screening based on crite	1w
57	1.4.1.3 refine criteria input for remaining techn	2d
58	1.4.1.4 score technologies against criteria	3d
59	1.4.2 verify and choose processes	27d
60	1.4.2.1 select technologies	1d
61	1.4.2.2 verify process	9d
62	1.4.2.2.1 collate influent data and physica	2d
63	1.4.2.2.2 simulate process unit	1w
64	1.4.2.2.3 evaluate performance of units	2d
65	1.4.2.3 Preliminary risk analysis	27d
66	1.4.2.3.1 review process	3w
67	1.4.2.3.2 identify hazards/prepare FMEA	2w
68	1.4.2.3.3 prepare document	2d
69	1.5 preconceptual design	17d

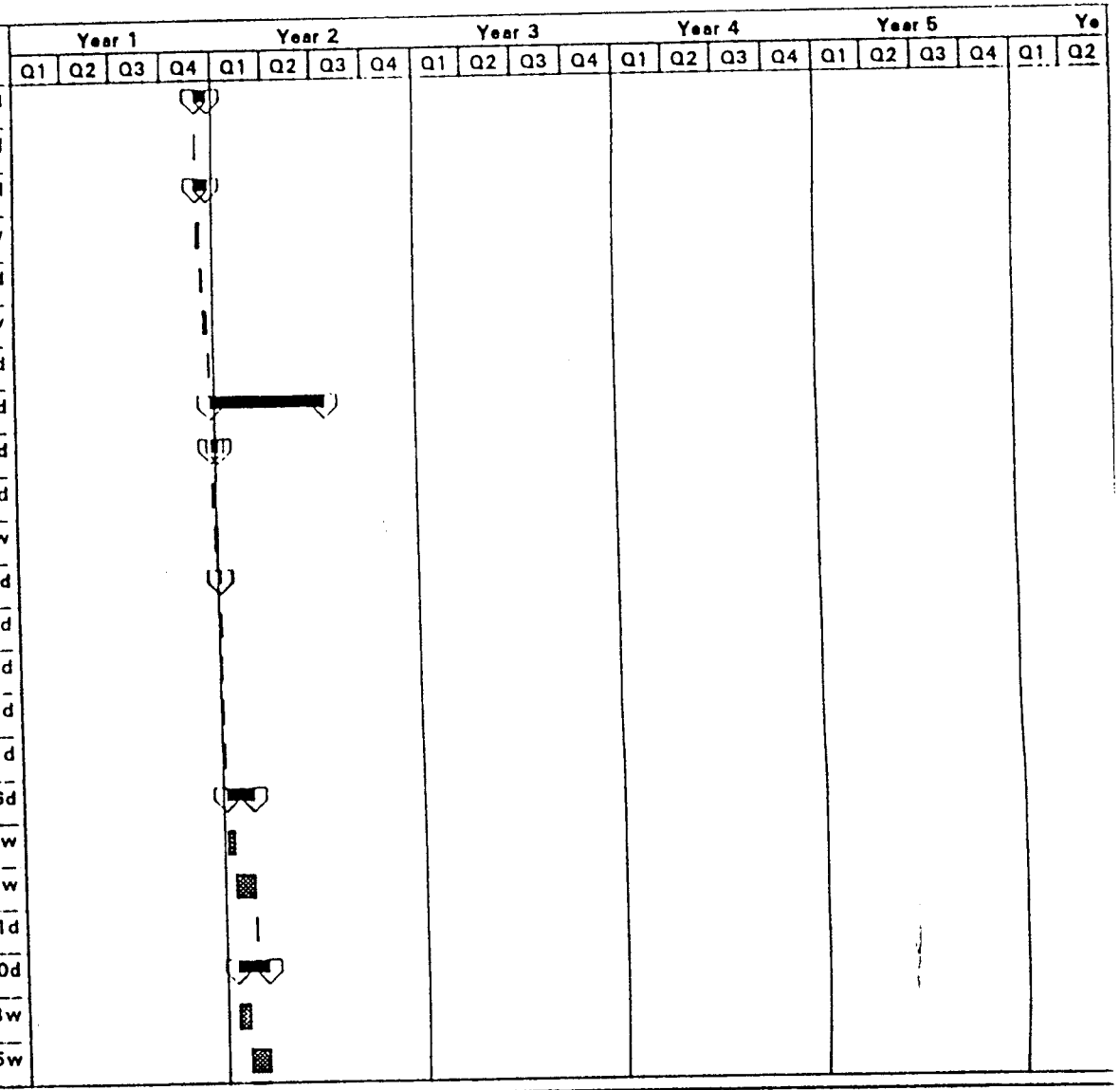


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

	Name	Duration
70	1.5.1 develop preliminary flow sheet	17d
71	1.5.1.1 evaluate process selection	1d
72	1.5.1.2 develop preliminary flow sheet	13d
73	1.5.1.2.1 construct flow sheet	1w
74	1.5.1.2.2 select controls	3d
75	1.5.1.2.3 simulate for m/e balances	1w
76	1.5.1.3 identify data needed for design	3d
77	1.6 bench scale testing	149d
78	1.6.1 prepare bench scale plan	9d
79	1.6.1.1 review design data	1d
80	1.6.1.2 develop plan	1w
81	1.6.1.3 document plan	3d
82	1.6.1.3.1 identify equipment and layout	3d
83	1.6.1.3.2 identify fluid and test parameter	1d
84	1.6.1.3.3 identify run conditions	1d
85	1.6.1.3.4 write plan	1d
86	1.6.2 procure equipment and supplies	36d
87	1.6.2.1 prepare purchase order and specificati	2w
88	1.6.2.2 process through MAT	5w
89	1.6.2.3 receive equipment and supplies	1d
90	1.6.3 prepare safety documentation	40d
91	1.6.3.1 write SOP	3w
92	1.6.3.2 HS SOP review	5w

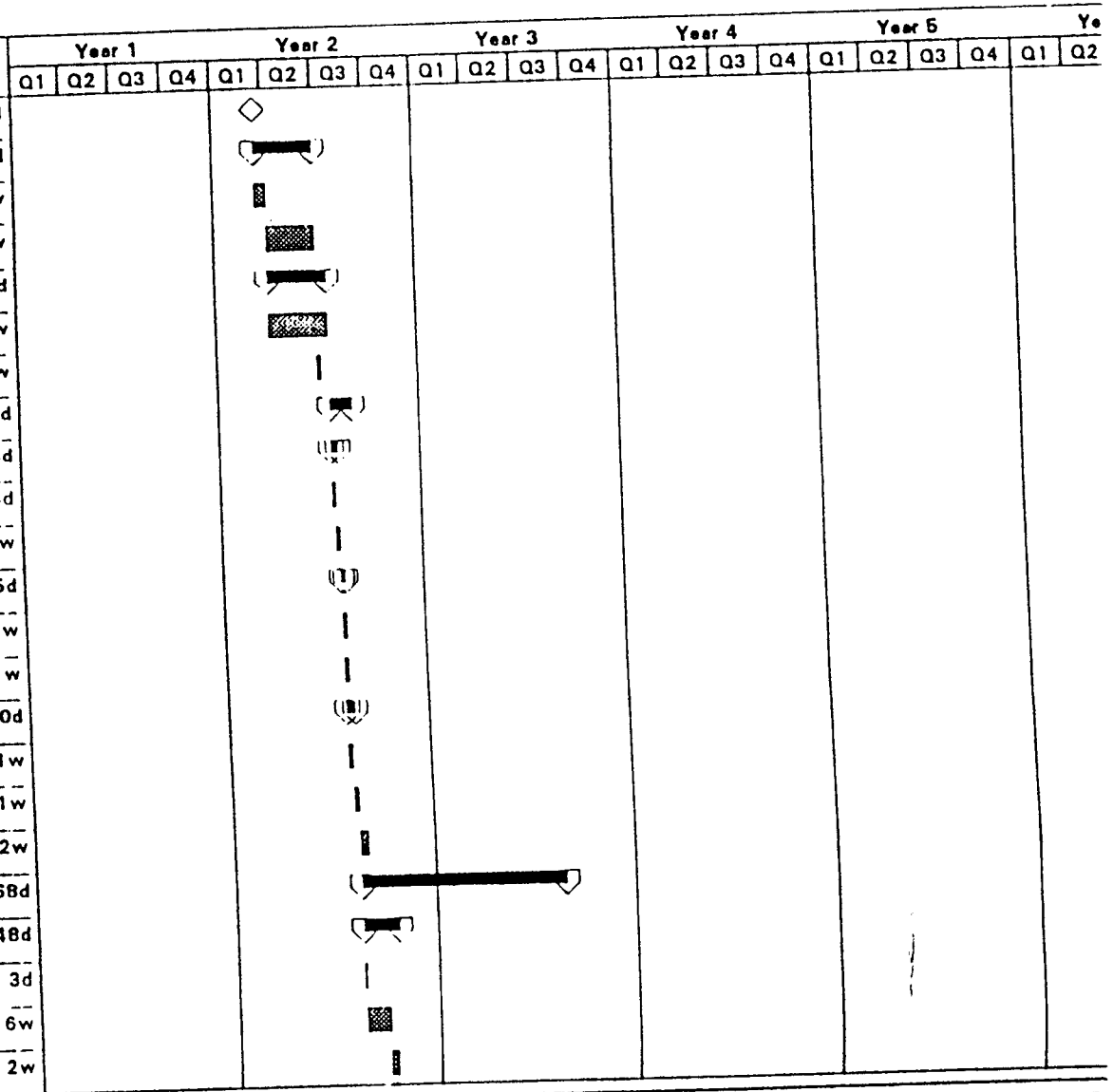


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

D	Name	Duration
93	1.6.3.3 SOP approval	0d
94	1.6.4 test	75d
95	1.6.4.1 set up bench scale test	3w
96	1.6.4.2 run tests	12w
97	1.6.5 finalize results	75d
98	1.6.5.1 analyze data and write report	15w
99	1.6.5.2 disassemble and clean up	1w
100	1.7 title I design (conceptual design)	28d
101	1.7.1 reevaluate flow sheet	8d
102	1.7.1.1 evaluate bench scale data	3d
103	1.7.1.2 develop usable flow sheet	1w
104	1.7.2 preliminary PFD, P&ID, piping	5d
105	1.7.2.1 PFD mass/heat balance	1w
106	1.7.2.2 preliminary P&ID	1w
107	1.7.3 identify major equipment components	10d
108	1.7.3.1 rough sizing of equipment	1w
109	1.7.3.2 document basis of design	1w
110	1.7.4 select operating site	2w
111	1.8 title II design (final design)	268d
112	1.8.1 task release	48d
113	1.8.1.1 prepare scope	3d
114	1.8.1.2 process thru MAT	6w
115	1.8.1.3 review proposal	2w

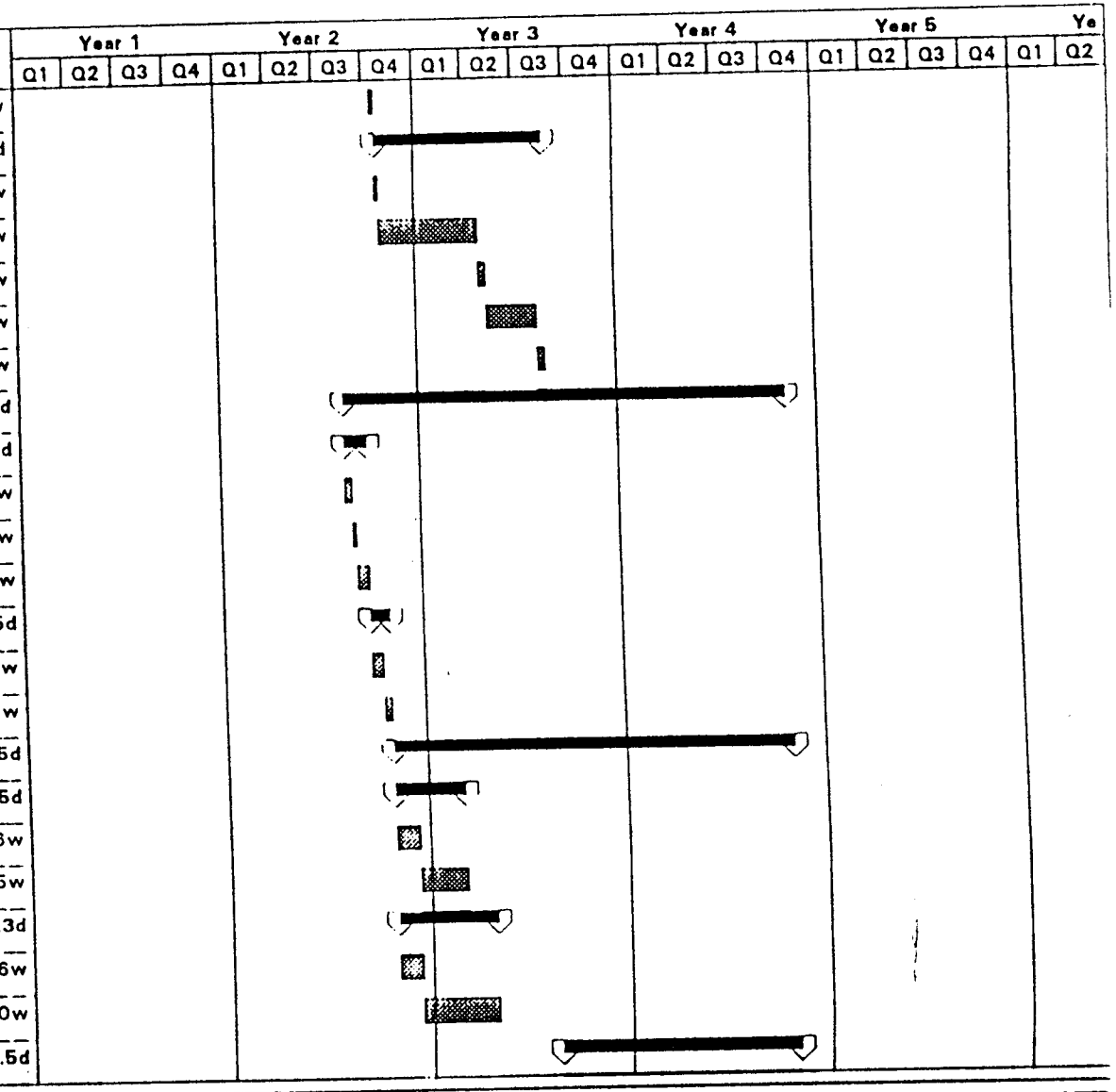


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

)	Name	Duration
116	1.8.1.4 release task	1w
117	1.8.2 title II by subcontractor	220d
118	1.8.2.1 prepare data package	1w
119	1.8.2.2 contractor draft design 1	26w
120	1.8.2.3 design review 1	2w
121	1.8.2.4 contractor final design	13w
122	1.8.2.5 design review final	2w
123	1.9 environmental permitting	580.5d
124	1.9.1 initiate permitting sequence	30d
125	1.9.1.1 determine potential emissions & secon	2w
126	1.9.1.2 prepare ES&H questionnaire	1w
127	1.9.1.3 ES&H questionnaire review period	3w
128	1.9.2 permit preparation	25d
129	1.9.2.1 obtain decision on permit requirements	3w
130	1.9.2.2 determine data needed for permits	2w
131	1.9.3 obtain permits (following interim design revie	525.5d
132	1.9.3.1 EA/NEPA (for piloting)	92.5d
133	1.9.3.1.1 NEPA Prep.	6w
134	1.9.3.1.2 NEPA Review	12.5w
135	1.9.3.2 NESHAPS	130.3d
136	1.9.3.2.1 NESHAPS appl. prep.	6.06w
137	1.9.3.2.2 NESHAPS permitting	20w
138	1.9.3.3 RCRA	312.5d

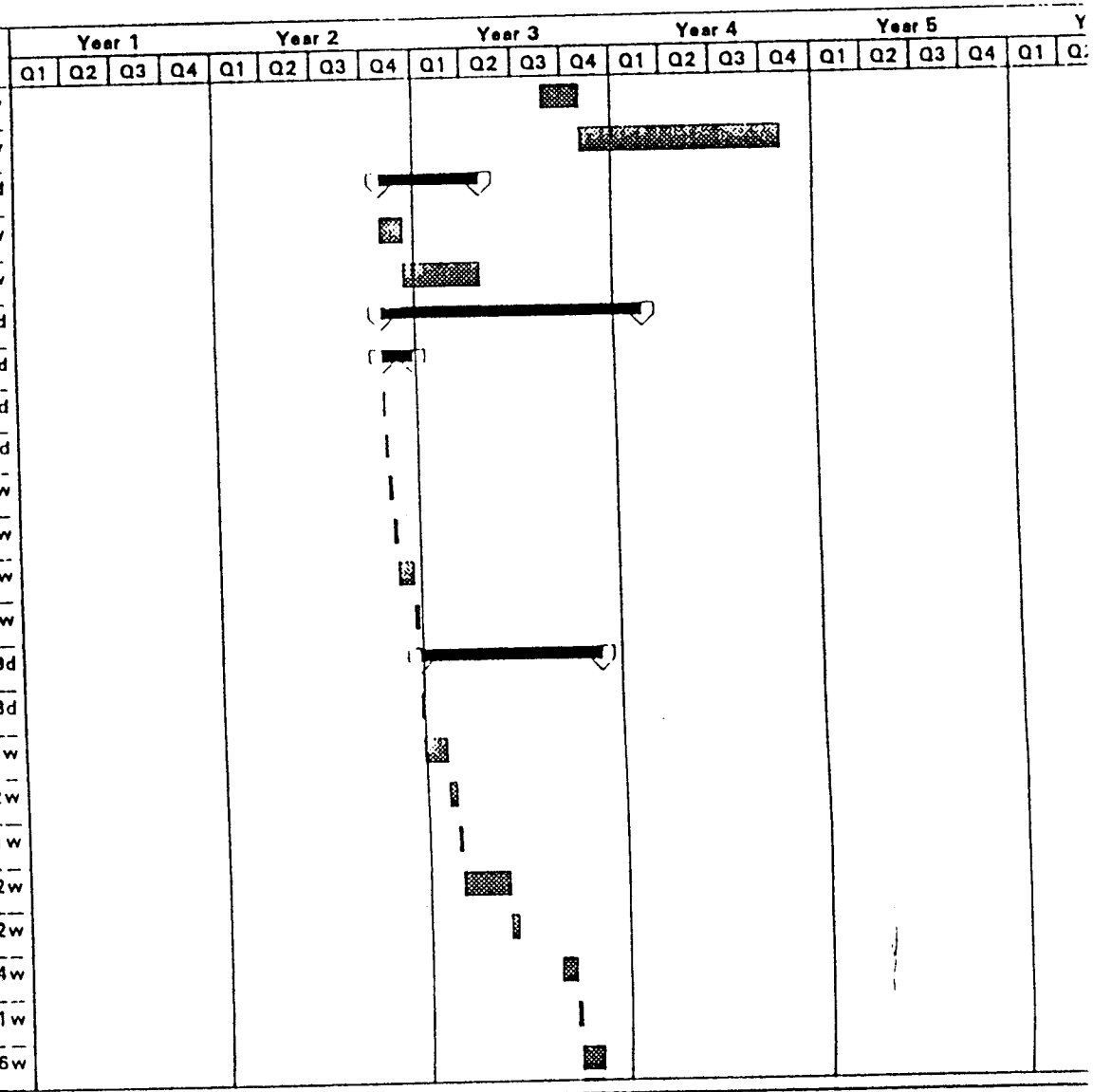


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
139	1.9.3.3.1 RCRA appl. prep.	10w
140	1.9.3.3.2 RCRA permitting	52.5w
141	1.9.3.4 State Air	130.3d
142	1.9.3.4.1 STATE air appl.	6.06w
143	1.9.3.4.2 STATE air permitted	20w
144	1.10 safety documentation	343d
145	1.10.1 preliminary hazard analysis	39d
146	1.10.1.1 review waste & bench scale data	2d
147	1.10.1.2 review TITLE I	2d
148	1.10.1.3 ID hazards/perform FMEA	1w
149	1.10.1.4 prepare PHA	1w
150	1.10.1.5 DOE review	4w
151	1.10.1.6 resolve comments	1w
152	1.10.2 PSAR	239d
153	1.10.2.1 prepare task scope	3d
154	1.10.2.2 process through MAT	6.07w
155	1.10.2.3 review proposals	2w
156	1.10.2.4 release task	1w
157	1.10.2.5 prepare draft PSAR	12w
158	1.10.2.6 draft review	2w
159	1.10.2.7 prepare final PSAR	4w
160	1.10.2.8 review final PSAR	1w
161	1.10.2.9 DOE review	6w

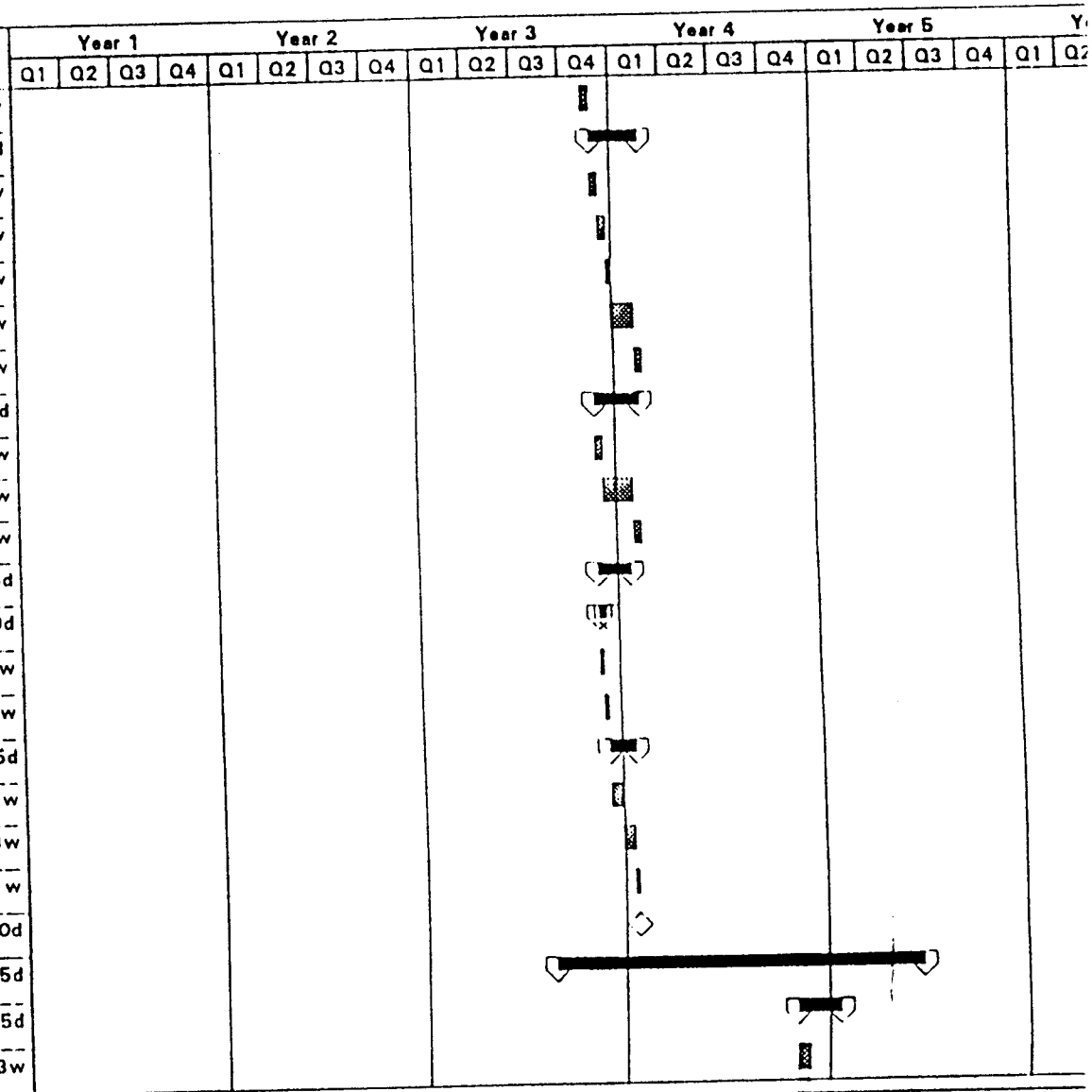


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical | Noncritical | Progress | Milestone | Summary | Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
162	1.10.2.10 resolve comments	2w
163	1.10.3 FSAR	65d
164	1.10.3.1 update descriptions/info	2w
165	1.10.3.2 update analysis	2w
166	1.10.3.3 update document	1w
167	1.10.3.4 DOE review	6w
168	1.10.3.5 resolve DOE comments	2w
169	1.10.4 SOP's	60d
170	1.10.4.1 develop SOPs	2w
171	1.10.4.2 LANL reviews	8w
172	1.10.4.3 incorporate comments into SOP	2w
173	1.11 operating documentation	45d
174	1.11.1 documentation assessments	10d
175	1.11.1.1 review title I and II design	1w
176	1.11.1.2 summarize essential information	1w
177	1.11.2 write document	35d
178	1.11.2.1 start up/shut down procedures	3w
179	1.11.2.2 general procedures	3w
180	1.11.2.3 safety/emergency procedures	1w
181	1.11.2.4 implement document	0d
182	1.12 title III (fabrication and construction)	478.5d
183	1.12.1 site preparation	55.15d
184	1.12.1.1 operating site doc.	3.03w

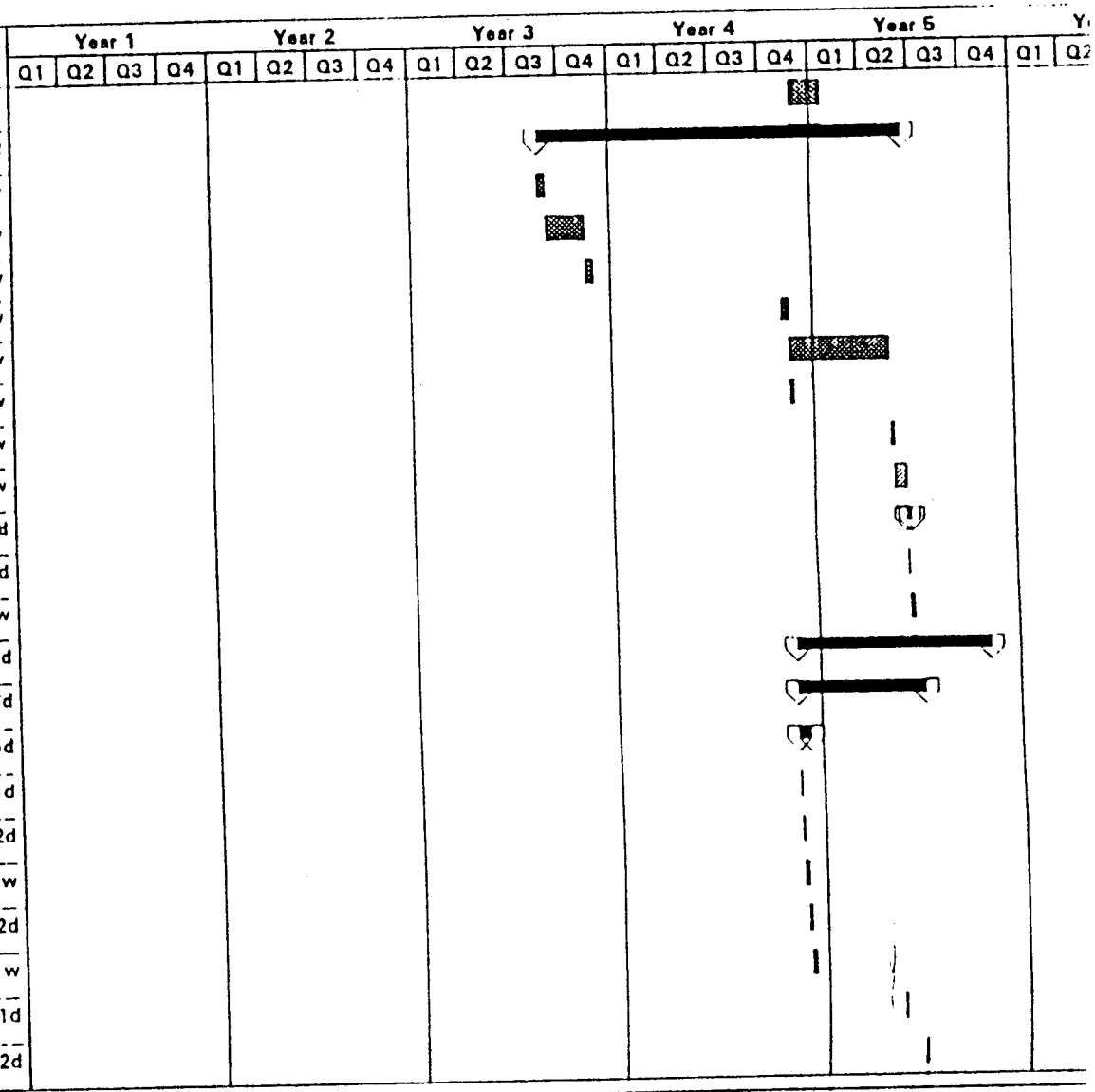


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
185	1.12.1.2 prepare site	8w
186	1.12.2 construction	472.5d
187	1.12.2.1 prepare spec package	2w
188	1.12.2.2 process through MAT	10w
189	1.12.2.3 review proposals	2w
190	1.12.2.4 release purchase order	2w
191	1.12.2.5 fabricate skids	26w
192	1.12.2.6 QA inspection	1w
193	1.12.2.7 acceptance inspection	1w
194	1.12.2.8 shipping	3w
195	1.12.3 set up	6d
196	1.12.3.1 set skids	1d
197	1.12.3.2 hook up utilities	1w
198	1.13 cold testing of equipment with modifications	253d
199	1.13.1 preparation	168d
200	1.13.1.1 develop cold test program	15d
201	1.13.1.1.1 define test	1d
202	1.13.1.1.2 identify test conditions	2d
203	1.13.1.1.3 prepare test	1w
204	1.13.1.1.4 document	2d
205	1.13.1.1.5 order run supplies	1w
206	1.13.1.2 assemble test crew	1d
207	1.13.1.3 schedule test runs	2d

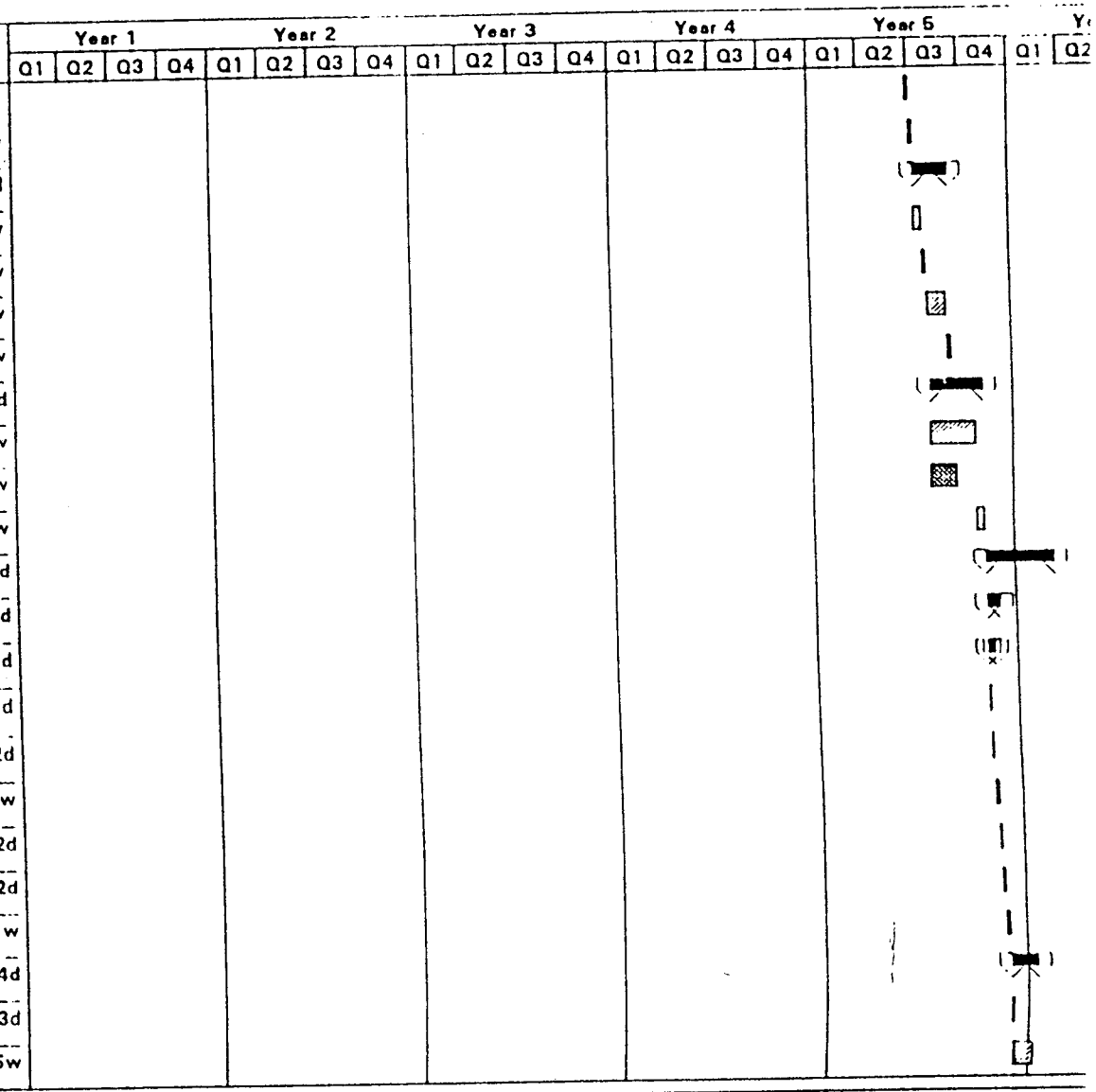


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
208	1.13.1.4 prepare equipment	1w
209	1.13.1.5 train crew	1w
210	1.13.2 test runs	45d
211	1.13.2.1 test equipment on water	2w
212	1.13.2.2 test equipment on cold waste	1w
213	1.13.2.3 investigate different operating conditi	5w
214	1.13.2.4 clean up	1w
215	1.13.3 analyze tests	70d
216	1.13.3.1 analyze test data	12w
217	1.13.3.2 correct problems	7w
218	1.13.3.3 document results	2w
219	1.14 hot testing (with wastes)	90d
220	1.14.1 preparation	17d
221	1.14.1.1 develop hot test program	10d
222	1.14.1.1.1 define test objectives	1d
223	1.14.1.1.2 identify test conditions/parame	2d
224	1.14.1.1.3 prepare test plan	1w
225	1.14.1.1.4 documentation	2d
226	1.14.1.2 schedule test runs	2d
227	1.14.1.3 prepare equipment	1w
228	1.14.2 test run	34d
229	1.14.2.1 run equipment check	3d
230	1.14.2.2 run test with hot waste	5w

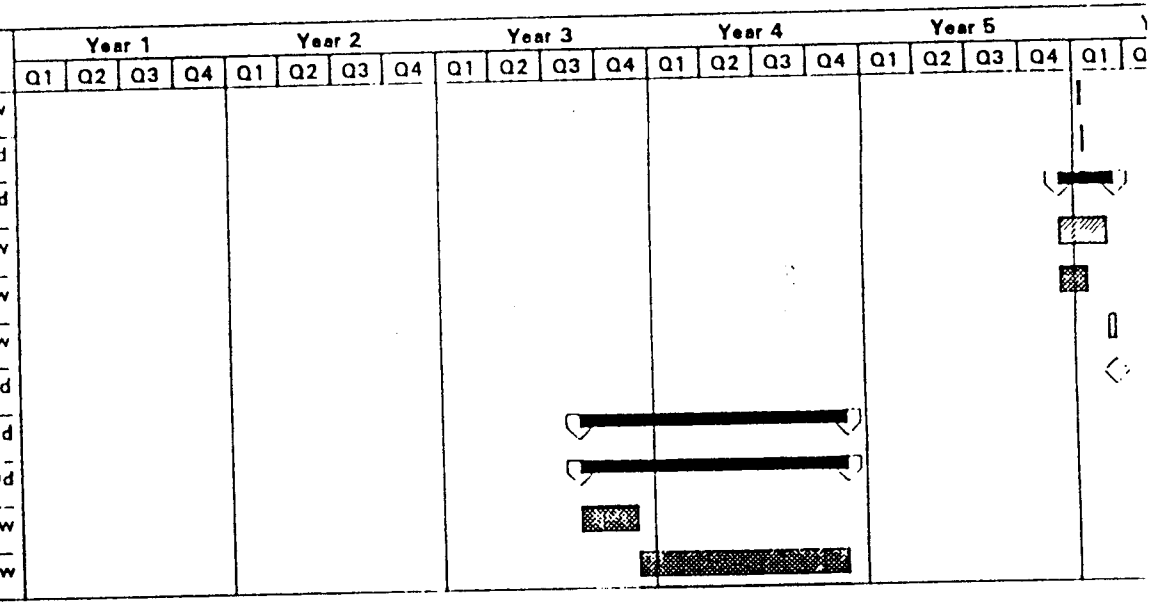


Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical | Noncritical | Progress | Milestone | Summary | Rolled Up

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration
231	1.14.2.3 clean up and decontamination	1w
232	1.14.2.4 wrap	1d
233	1.14.3 analyze test	70d
234	1.14.3.1 analyze test data	12w
235	1.14.3.2 correct problems	7w
236	1.14.3.3 document results	2w
237	1.14.4 ready to go!	0d
238	2 optional steps	330d
239	2.1 NEPA for operation	330d
240	2.1.1 preparation	14w
241	2.1.2 permitting	52w



Project: GENERIC TREATMENT SKID PLAN
Date: 12/17/92

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

Appendix B
Gantt Chart Support Tables

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration	Predecessors	Resource Names
1	1 skid mounted treatment process	1356.77d		
2	1.1 waste sampling	106d		
3	1.1.1 waste investigation	15d		
4	1.1.1.1 check waste records	1w		EM-7 STAFF[0.6]
5	1.1.1.2 contact generators	1w	4	EM-7 STAFF
6	1.1.1.3 consolidate information - report	1w	5	EM-7 STAFF[0.6]
7	1.1.2 sampling plan	24d		
8	1.1.2.1 prepare waste analysis plan	19d		
9	1.1.2.1.1 determine analytical paramet	2d	6	EM-7 STAFF
10	1.1.2.1.2 identify analytical time limits	2d	9	EM-7 STAFF
11	1.1.2.1.3 locate labs	1w	10	EM-7 STAFF[0.6]
12	1.1.2.1.4 negotiate schedule	2w	11	EM-7 STAFF[0.5]
13	1.1.2.2 equipment identification	1w	10	EM-7 STAFF,EM-7 OTHER
14	1.1.2.3 write sampling plan	1w	13	EM-7 STAFF,EM-7 OTHER
15	1.1.2.4 equipment purchase	1w	12	EM-7 STAFF[0.6],MAT'L & SUPP
16	1.1.3 write safety documents	62d		
17	1.1.3.1 prepare documents	3w	6	EM-7 STAFF
18	1.1.3.2 submit for review	1d	17	EM-7 STAFF
19	1.1.3.3 review	8w	18	
20	1.1.3.4 revise for comments	1w	19	EM-7 STAFF[0.6]
21	1.1.3.5 finalize	1d	20	EM-7 STAFF
22	1.1.4 sampling	29d		
23	1.1.4.1 schedule manpower	1w	21,15,14	EM-7 STAFF[0.4]
24	1.1.4.2 prepare equipment and containers	3d	21,15FS+3w	EM-7 STAFF,EM-7 OTHER
25	1.1.4.3 sample plan training	1d	23FS+3w,24	EM-7 STAFF,EM-7 OTHER[2],HS-
26	1.1.4.4 field sampling	1w	25	EM-7 STAFF,EM-7 OTHER[2],HS-
27	1.1.4.5 prepare chain of custody documents	1d	26	EM-7 OTHER
28	1.1.4.6 sample documentation	1d	27	EM-7 STAFF
29	1.1.4.7 clean up	3d	26	EM-7 STAFF,EM-7 OTHER[2]
30	1.2 waste characterization	37.97d		
31	1.2.1 submit samples	2d	27	EM-7 OTHER
32	1.2.2 file documentation	2d	28	EM-7 STAFF,EM-7 OTHER
33	1.2.3 analyze samples	2.99w	31	EM-7 STAFF[0.07],ANALYTICAL
34	1.2.4 analyze results	21d		
35	1.2.4.1 evaluate results	1w	33	EM-7 STAFF[0.8]
36	1.2.4.2 evaluate QA's	1w	35SS	EM-7 STAFF[0.2]
37	1.2.4.3 file analytical documents	1d	35,36	EM-7 STAFF
38	1.2.4.4 sampling campaign reporting	3w	37	EM-7 STAFF[0.33],EM-7 OTHER[
39	1.3 identifying treatment technology	57.3d		
40	1.3.1 prepare search plan	7d		
41	1.3.1.1 review waste sampling results	3d	38	EM-7 STAFF
42	1.3.1.2 categorize results	2d	41	EM-7 STAFF
43	1.3.1.3 outline search plan	2d	42	EM-7 STAFF
44	1.3.2 Literature search	30.3d		
45	1.3.2.1 study primary sources	6w	43	EM-7 STAFF[0.33]
46	1.3.2.2 check references in primary sources	3.03w	45SS	EM-7 STAFF[0.33]
47	1.3.2.3 contact DOE sources	3.03w	45SS	EM-7 STAFF[0.33]
48	1.3.2.4 contact industrial sources	6.06w	45SS	EM-7 STAFF[0.33]
49	1.3.3 Results from literature search	20d		
50	1.3.3.1 consolidate information	1w	47,48,46,45	EM-7 STAFF
51	1.3.3.2 evaluate results	2w	50	EM-7 STAFF
52	1.3.3.3 document results	1w	51	EM-7 STAFF
53	1.4 process selection	39d		
54	1.4.1 process evaluation	12d		
55	1.4.1.1 develop evaluation criteria	2d	52	EM-7 STAFF[2]
56	1.4.1.2 perform initial screening based on cr	1w	55	EM-7 STAFF
57	1.4.1.3 refine criteria input for remaining tec	2d	56	EM-7 STAFF[2]
58	1.4.1.4 score technologies against criteria	3d	57	EM-7 STAFF
59	1.4.2 verify and choose processes	27d		
60	1.4.2.1 select technologies	1d	58	EM-7 STAFF
61	1.4.2.2 verify process	9d		
62	1.4.2.2.1 collate influent data and phy	2d	60	EM-7 STAFF
63	1.4.2.2.2 simulate process unit	1w	62	EM-7 STAFF
64	1.4.2.2.3 evaluate performance of unit	2d	63	EM-7 STAFF
65	1.4.2.3 Preliminary risk analysis	27d		
66	1.4.2.3.1 review process	3w	60SS	EM-7 STAFF[0.2],N6 STAFF[0.2]
67	1.4.2.3.2 identify hazards/prepare FME	2w	66	N6 STAFF
68	1.4.2.3.3 prepare document	2d	67	N6 STAFF
69	1.5 preconceptual design	17d		
70	1.5.1 develop preliminary flow sheet	17d		
71	1.5.1.1 evaluate process selection	1d	68	EM-7 STAFF
72	1.5.1.2 develop preliminary flow sheet	13d		
73	1.5.1.2.1 construct flow sheet	1w	71	EM-7 STAFF,EM-7 OTHER[0.6]
74	1.5.1.2.2 select controls	3d	73	EM-7 STAFF
75	1.5.1.2.3 simulate for m/e balances	1w	74	EM-7 STAFF,EM-7 OTHER[0.6]

12/17/92

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration	Predecessors	Resource Names
76	1.5.1.3 identify data needed for design	3d	75	EM-7 STAFF
77	1.6 bench scale testing	149d		
78	1.6.1 prepare bench scale plan	9d		
79	1.6.1.1 review design data	1d	76	EM-7 STAFF[2]
80	1.6.1.2 develop plan	1w	79	EM-7 STAFF
81	1.6.1.3 document plan	3d		
82	1.6.1.3.1 identify equipment and layou	3d	80	EM-7 STAFF
83	1.6.1.3.2 identify fluid and test parame	1d	80.82SS	EM-7 STAFF
84	1.6.1.3.3 identify run conditions	1d	83	EM-7 STAFF
85	1.6.1.3.4 write plan	1d	84	EM-7 STAFF
86	1.6.2 procure equipment and supplies	36d		
87	1.6.2.1 prepare purchase order and specific	2w	82	EM-7 STAFF[0.5],EM-7 OTHER
88	1.6.2.2 process through MAT	5w	87	EM-7 STAFF[0.04]
89	1.6.2.3 receive equipment and supplies	1d	88	EM-7 OTHER,MAT'L & SUPPLIES[
90	1.6.3 prepare safety documentation	40d		
91	1.6.3.1 write SOP	3w	87	EM-7 STAFF[0.33],EM-7 OTHER[
92	1.6.3.2 HS SOP review	5w	91	EM-7 STAFF[0.04],EM-7 OTHER[
93	1.6.3.3 SOP approval	0d	92	
94	1.6.4 test	75d		
95	1.6.4.1 set up bench scale test	3w	93,89	EM-7 STAFF[0.33],EM-7 OTHER
96	1.6.4.2 run tests	12w	95	EM-7 STAFF[0.2],EM-7 OTHER,A
97	1.6.5 finalize results	75d		
98	1.6.5.1 analyze data and write report	15w	96SS	EM-7 STAFF[0.13],EM-7 OTHER[
99	1.6.5.2 disassemble and clean up	1w	96	EM-7 OTHER
100	1.7 title I design (conceptual design)	28d		
101	1.7.1 reevaluate flow sheet	8d		
102	1.7.1.1 evaluate bench scale data	3d	98	EM-7 STAFF
103	1.7.1.2 develop usable flow sheet	1w	102	EM-7 STAFF
104	1.7.2 preliminary PFD, P&ID, piping	5d		
105	1.7.2.1 PFD mass/heat balance	1w	103	EM-7 STAFF,EM-7 OTHER
106	1.7.2.2 preliminary P&ID	1w	103	EM-7 STAFF,EM-7 OTHER
107	1.7.3 identify major equipment components	10d		
108	1.7.3.1 rough sizing of equipment	1w	106SS	EM-7 STAFF
109	1.7.3.2 document basis of design	1w	108	EM-7 STAFF
110	1.7.4 select operating site	2w	109	EM-7 STAFF[0.5]
111	1.8 title II design (final design)	268d		
112	1.8.1 task release	48d		
113	1.8.1.1 prepare scope	3d	109	EM-7 STAFF
114	1.8.1.2 process thru MAT	6w	113	EM-7 STAFF[0.07]
115	1.8.1.3 review proposal	2w	114	EM-7 STAFF[0.3]
116	1.8.1.4 release task	1w	115	EM-7 STAFF[0.2],DESIGN SUB[0]
117	1.8.2 title II by subcontractor	220d		
118	1.8.2.1 prepare data package	1w	116	EM-7 STAFF[0.6],EM-7 OTHER[0.
119	1.8.2.2 contractor draft design I	26w	118	EM-7 STAFF[0.1],EM-7 OTHER[0.
120	1.8.2.3 design review I	2w	119	EM-7 STAFF,EM-7 OTHER[0.5]
121	1.8.2.4 contractor final design	13w	120	EM-7 STAFF[0.09],EM-7 OTHER[
122	1.8.2.5 design review final	2w	121	EM-7 STAFF[0.6],EM-7 OTHER[0.
123	1.9 environmental permitting	580.5d		
124	1.9.1 initiate permitting sequence	30d		
125	1.9.1.1 determine potential emissions & sec	2w	109	EM-7 STAFF
126	1.9.1.2 prepare ES&H questionnaire	1w	125	EM-7 STAFF[0.6]
127	1.9.1.3 ES&H questionnaire review period	3w	126	
128	1.9.2 permit preparation	25d		
129	1.9.2.1 obtain decision on permit requireme	3w	127	EM-7 STAFF[0.33]
130	1.9.2.2 determine data needed for permits	2w	129	EM-7 STAFF[0.5]
131	1.9.3 obtain permits (following interim design revi	525.5d		
132	1.9.3.1 EA/NEPA (for piloting)	92.5d		
133	1.9.3.1.1 NEPA Prep.	6w	130,110,125	EM-7 STAFF[0.17],EM-8 STAFF[0
134	1.9.3.1.2 NEPA Review	12.5w	133	EM-7 STAFF[0.02],EM-8 STAFF[0
135	1.9.3.2 NESHAPS	130.3d		
136	1.9.3.2.1 NESHAPS appl. prep.	6.06w	130,125	EM-7 STAFF[0.17],EM-8 STAFF[0
137	1.9.3.2.2 NESHAPS permitting	20w	136	EM-7 STAFF[0.01],EM-8 STAFF[0
138	1.9.3.3 RCRA	312.5d		
139	1.9.3.3.1 RCRA appl. prep.	10w	130,122	EM-7 STAFF[0.1],EM-8 STAFF[0.
140	1.9.3.3.2 RCRA permitting	52.5w	139	EM-7 STAFF[0.02],EM-8 STAFF[0
141	1.9.3.4 State Air	130.3d		
142	1.9.3.4.1 STATE air appl.	6.06w	130,125	EM-7 STAFF[0.17],EM-8 STAFF[0
143	1.9.3.4.2 STATE air permitted	20w	142	EM-7 STAFF[0.01],EM-8 STAFF[0
144	1.10 safety documentation	343d		
145	1.10.1 preliminary hazard analyses	39d		
146	1.10.1.1 review waste & bench scale data	2d	130,98	EM-7 STAFF
147	1.10.1.2 review TITLE I	2d	146,109,110	EM-7 STAFF
148	1.10.1.3 ID hazards/perform FMEA	1w	147	EM-7 STAFF,HS-3 STAFF
149	1.10.1.4 prepare PHA	1w	148	EM-7 STAFF,EM-7 OTHER[0.4],[0
150	1.10.1.5 DOE review	4w	149	EM-7 STAFF[0.05],HS-3 STAFF[0

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration	Predecessors	Resource Names
151	1.10.1.6 resolve comments	1w	160	EM-7 STAFF[0.4],EM-7 OTHER[0.
152	1.10.2 PSAR	239d		
153	1.10.2.1 prepare task scope	3d	151	EM-7 STAFF
154	1.10.2.2 process through MAT	6.07w	153	EM-7 STAFF[0.07]
155	1.10.2.3 review proposals	2w	154	EM-7 STAFF[0.3]
156	1.10.2.4 release task	1w	155	EM-7 STAFF[0.2]
157	1.10.2.5 prepare draft PSAR	12w	156	EM-7 STAFF[0.2],EM-7 OTHER[0.
158	1.10.2.6 draft review	2w	157	EM-7 STAFF[0.5],HS-3 STAFF[0.
159	1.10.2.7 prepare final PSAR	4w	158,122	EM-7 STAFF[0.2],EM-7 OTHER[0.
160	1.10.2.8 review final PSAR	1w	159	EM-7 STAFF[0.6],HS-3 STAFF[0.
161	1.10.2.9 DOE review	6w	160	
162	1.10.2.10 resolve comments	2w	161	EM-7 STAFF[0.2],HS-3 STAFF[0.
163	1.10.3 FSAR	65d		
164	1.10.3.1 update descriptions/info	2w	162,122	EM-7 STAFF[0.3],HS-3 STAFF[0.
165	1.10.3.2 update analysis	2w	164	EM-7 STAFF[0.3],HS-3 STAFF[0.
166	1.10.3.3 update document	1w	165	EM-7 STAFF[0.4],HS-3 STAFF[0.
167	1.10.3.4 DOE review	6w	166	
168	1.10.3.5 resolve DOE comments	2w	167	EM-7 STAFF[0.2],HS-3 STAFF[0.
169	1.10.4 SOP's	60d		
170	1.10.4.1 develop SOPs	2w	164SS	EM-7 STAFF[0.6],EM-7 OTHER[0.
171	1.10.4.2 LANL reviews	8w	170	
172	1.10.4.3 incorporate comments into SOP	2w	171	EM-7 STAFF[0.3]
173	1.11 operating documentation	45d		
174	1.11.1 documentation assessments	10d		
175	1.11.1.1 review title I and II design	1w	170SS	EM-7 STAFF,EM-7 OTHER[0.6]
176	1.11.1.2 summarize essential information	1w	175	EM-7 STAFF,EM-7 OTHER[0.6]
177	1.11.2 write document	35d		
178	1.11.2.1 start up/shut down procedures	3w	176	EM-7 STAFF,EM-7 OTHER[0.5]
179	1.11.2.2 general procedures	3w	178	EM-7 STAFF,EM-7 OTHER[0.5]
180	1.11.2.3 safety/emergency procedures	1w	179	EM-7 STAFF,EM-7 OTHER[1.2]
181	1.11.2.4 implement document	0d	180	
182	1.12 title III (fabrication and construction)	478.5d		
183	1.12.1 site preparation	55.15d		
184	1.12.1.1 operating site doc.	3.03w	134,140,143,12	EM-7 STAFF[0.33]
185	1.12.1.2 prepare site	8w	184	EM-7 STAFF[0.05],EM-7 OTHER[
186	1.12.2 construction	472.5d		
187	1.12.2.1 prepare spec package	2w	122	EM-7 STAFF,EM-7 OTHER[0.5]
188	1.12.2.2 process through MAT	10w	187	EM-7 STAFF[0.06]
189	1.12.2.3 review proposals	2w	188	EM-7 STAFF[0.5]
190	1.12.2.4 release purchase order	2w	189,134,140,14	
191	1.12.2.5 fabricate skids	26w	190	EM-7 STAFF[0.1]
192	1.12.2.6 QA inspection	1w	191SS	EM-7 STAFF,EM-7 OTHER[2]
193	1.12.2.7 acceptance inspection	1w	191	EM-7 STAFF,EM-7 OTHER[2]
194	1.12.2.8 shipping	3w	193	EM-7 STAFF[0.14],EM-7 OTHER[
195	1.12.3 set up	6d		
196	1.12.3.1 set skids	1d	194	EM-7 STAFF,EM-7 OTHER[3]
197	1.12.3.2 hook up utilities	1w	196	EM-7 STAFF,EM-7 OTHER[3]
198	1.13 cold testing of equipment with modifications	253d		
199	1.13.1 preparation	168d		
200	1.13.1.1 develop cold test program	15d		
201	1.13.1.1.1 define test	1d	191SS	EM-7 STAFF,EM-7 OTHER[2]
202	1.13.1.1.2 identify test conditions	2d	201	EM-7 STAFF,EM-7 OTHER[2]
203	1.13.1.1.3 prepare test	1w	202	EM-7 STAFF[0.6],EM-7 OTHER[1.
204	1.13.1.1.4 document	2d	203	EM-7 STAFF[0.5],EM-7 OTHER
205	1.13.1.1.5 order run supplies	1w	204	EM-7 STAFF[0.6],EM-7 OTHER[2]
206	1.13.1.2 assemble test crew	1d	193SS	EM-7 STAFF
207	1.13.1.3 schedule test runs	2d	205,206,197	EM-7 STAFF[0.5]
208	1.13.1.4 prepare equipment	1w	207	EM-7 STAFF[0.6],EM-7 OTHER[2]
209	1.13.1.5 train crew	1w	208	EM-7 STAFF,EM-7 OTHER[3]
210	1.13.2 test runs	45d		
211	1.13.2.1 test equipment on water	2w	209	EM-7 STAFF,EM-7 OTHER[3]
212	1.13.2.2 test equipment on cold waste	1w	211	EM-7 STAFF,EM-7 OTHER[3],AN
213	1.13.2.3 investigate different operating con	5w	212	EM-7 STAFF[0.5],EM-7 OTHER[3]
214	1.13.2.4 clean up	1w	213	EM-7 OTHER[2]
215	1.13.3 analyze tests	70d		
216	1.13.3.1 analyze test data	12w	213SS	EM-7 STAFF[0.37]
217	1.13.3.2 correct problems	7w	213SS	EM-7 OTHER[0.6]
218	1.13.3.3 document results	2w	216	EM-7 STAFF[0.5],EM-7 OTHER[0.
219	1.14 hot testing (with wastes)	90d		
220	1.14.1 preparation	17d		
221	1.14.1.1 develop hot test program	10d		
222	1.14.1.1.1 define test objectives	1d	218	EM-7 STAFF,EM-7 OTHER[2]
223	1.14.1.1.2 identify test conditions/para	2d	222	EM-7 STAFF,EM-7 OTHER[2]
224	1.14.1.1.3 prepare test plan	1w	223	EM-7 STAFF[0.6],EM-7 OTHER[1.
225	1.14.1.1.4 documentation	2d	224	EM-7 STAFF[0.5],EM-7 OTHER

GENERIC TREATMENT SKID DEVELOPMENT PLAN

ID	Name	Duration	Predecessors	Resource Names
226	1.14.1.2 schedule test runs	2d	225	EM-7 STAFF[0.5]
227	1.14.1.3 prepare equipment	1w	226	EM-7 STAFF[0.6],EM-7 OTHER[2]
228	1.14.2 test run	34d		
229	1.14.2.1 run equipment check	3d	227,217	EM-7 STAFF,EM-7 OTHER[3],HS-
230	1.14.2.2 run test with hot waste	5w	229	EM-7 STAFF[0.52],EM-7 OTHER[
231	1.14.2.3 clean up and decontamination	1w	230	EM-7 STAFF[0.4],EM-7 OTHER[2]
232	1.14.2.4 wrap	1d	231	EM-7 STAFF,EM-7 OTHER[3],HS-
233	1.14.3 analyze test	70d		
234	1.14.3.1 analyze test data	12w	230SS	EM-7 STAFF[0.37]
235	1.14.3.2 correct problems	7w	230SS	EM-7 OTHER[0.6]
236	1.14.3.3 document results	2w	234	EM-7 STAFF[0.5],EM-7 OTHER[0.
237	1.14.4 ready to go!	0d	236,235,231	
238	2 optional steps	330d		
239	2.1 NEPA for operation	330d		
240	2.1.1 preparation	14w	122	EM-7 STAFF[0.08],EM-8 STAFF.
241	2.1.2 permitting	52w	240	EM-7 STAFF[0.02],EM-8 STAFF[0

Appendix C
Resource Tables

GENERIC TREATMENT SKID DEVELOPMENT PLAN

.D	Name	Duration	Predecessors
4	check waste records	1w	

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00

5	contact generators	1w	4

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

6	consolidate information - report	1w	5

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00

9	determine analytical parameters	2d	6

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

10	identify analytical time limits	2d	9

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

11	locate labs	1w	10

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00

12	negotiate schedule	2w	11

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00

13	equipment identification	1w	10

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

14	write sampling plan	1w	13

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

15	equipment purchase	1w	12

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
29	MAT'L & SUPPLIES	0	$2,400.00	$0.00	$0.00	$2,400.00

17	prepare documents	3w	6

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

18	submit for review	1d	17

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

19	review	8w	18
20	revise for comments	1w	19

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00

21	finalize	1d	20

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

23	schedule manpower	1w	21,15,14

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.4	$0.00	$0.00	$0.00	$0.00

24	prepare equipment and containers	3d	21,15FS+3w

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

D	Name	Duration	Predecessors
25	sample plan training	1d	23FS+3w,24

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00
17	HS-1 OTHER	1	$0.00	$0.00	$0.00	$0.00

26	field sampling	1w	25

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00
17	HS-1 OTHER	1	$0.00	$0.00	$0.00	$0.00

27	prepare chain of custody documents	1d	26

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

28	sample documentation	1d	27

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

29	clean up	3d	26

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

31	submit samples	2d	27

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

32	file documentation	2d	28

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

33	analyze samples	2.99w	31

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.07	$0.00	$0.00	$0.00	$0.00
23	ANALYTICAL SUB	0	$27,500.00	$0.00	$0.00	$27,500.00

35	evaluate results	1w	33

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.8	$0.00	$0.00	$0.00	$0.00

36	evaluate QA's	1w	35SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00

37	file analytical documents	1d	35,36

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

38	sampling campaign reporting	3w	37

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.33	$0.00	$0.00	$0.00	$0.00

41	review waste sampling results	3d	38

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

42	categorize results	2d	41

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

43	outline search plan	2d	42

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
45	study primary sources	6w	43
46	check references in primary sources	3.03w	45SS
47	contact DOE sources	3.03w	45SS
48	contact industrial sources	6.06w	45SS
50	consolidate information	1w	47,48,46,45
51	evaluate results	2w	50
52	document results	1w	51
55	develop evaluation criteria	2d	52
56	perform initial screening based on criteria	1w	55
57	refine criteria input for remaining technology	2d	56
58	score technologies against criteria	3d	57
60	select technologies	1d	58
62	collate influent data and physical properties	2d	60
63	simulate process unit	1w	62
64	evaluate performance of units	2d	63
66	review process	3w	60SS
67	identify hazards/prepare FMEA	2w	66

45 study primary sources

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00

46 check references in primary sources

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00

47 contact DOE sources

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00

48 contact industrial sources

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00

50 consolidate information

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

51 evaluate results

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

52 document results

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

55 develop evaluation criteria

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	2	$0.00	$0.00	$0.00	$0.00

56 perform initial screening based on criteria

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

57 refine criteria input for remaining technology

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	2	$0.00	$0.00	$0.00	$0.00

58 score technologies against criteria

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

60 select technologies

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

62 collate influent data and physical properties

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

63 simulate process unit

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

64 evaluate performance of units

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

66 review process

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
19	N6 STAFF	0.2	$0.00	$0.00	$0.00	$0.00

67 identify hazards/prepare FMEA

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
19	N6 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
68	prepare document	2d	67

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
19	N6 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
71	evaluate process selection	1d	68

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
73	construct flow sheet	1w	71

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.6	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
74	select controls	3d	73

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
75	simulate for m/e balances	1w	74

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.6	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
76	identify data needed for design	3d	75

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
79	review design data	1d	76

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
80	develop plan	1w	79

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
82	identify equipment and layout	3d	80

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
83	identify fluid and test parameters	1d	80,82SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
84	identify run conditions	1d	83

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
85	write plan	1d	84

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
87	prepare purchase order and specification	2w	82

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
88	process through MAT	5w	87

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.04	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
89	receive equipment and supplies	1d	88

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00
29	MAT'L & SUPPLIES	0	$32,000.00	$0.00	$0.00	$32,000.00

ID	Name	Duration	Predecessors
91	write SOP	3w	87

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.33	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
92	HS SOP review	5w	91
93	SOP approval	0d	92
95	set up bench scale test	3w	83,89
96	run tests	12w	95
98	analyze data and write report	15w	96SS
99	disassemble and clean up	1w	96
102	evaluate bench scale data	3d	98
103	develop usable flow sheet	1w	102
105	PFD mass/heat balance	1w	103
106	preliminary P&ID	1w	103
108	rough sizing of equipment	1w	106SS
109	document basis of design	1w	108
110	select operating site	2w	109
113	prepare scope	3d	109
114	process thru MAT	6w	113
115	review proposal	2w	114

92 HS SOP review

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.04	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.08	$0.00	$0.00	$0.00	$0.00

95 set up bench scale test

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

96 run tests

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00
23	ANALYTICAL SUB	0	$16,500.00	$0.00	$0.00	$16,500.00

98 analyze data and write report

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.13	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.2	$0.00	$0.00	$0.00	$0.00

99 disassemble and clean up

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

102 evaluate bench scale data

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

103 develop usable flow sheet

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

105 PFD mass/heat balance

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

106 preliminary P&ID

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

108 rough sizing of equipment

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

109 document basis of design

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

110 select operating site

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00

113 prepare scope

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

114 process thru MAT

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.07	$0.00	$0.00	$0.00	$0.00

115 review proposal

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.3	$0.00	$0.00	$0.00	$0.00

:D	Name	Duration	Predecessors
116	release task	1w	115

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
27	DESIGN SUB	0	$240,000.00	$0.00	$0.00	$240,000.00

118	prepare data package	1w	116

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.4	$0.00	$0.00	$0.00	$0.00

119	contractor draft design 1	26w	118

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.04	$0.00	$0.00	$0.00	$0.00

120	design review 1	2w	119

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.5	$0.00	$0.00	$0.00	$0.00

121	contractor final design	13w	120

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.09	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.05	$0.00	$0.00	$0.00	$0.00

122	design review final	2w	121

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.3	$0.00	$0.00	$0.00	$0.00

125	determine potential emissions & secondary wastes	2w	109

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

126	prepare ES&H questionnaire	1w	125

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00

127	ES&H questionnaire review period	3w	126
129	obtain decision on permit requirements	3w	127

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00

130	determine data needed for permits	2w	129

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00

133	NEPA Prep.	6w	130,110,125

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.17	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.33	$0.00	$0.00	$0.00	$0.00
24	NEPA SUB	0	$10,000.00	$0.00	$0.00	$10,000.00

134	NEPA Review	12.5w	133

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.02	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.08	$0.00	$0.00	$0.00	$0.00

136	NESHAPS appl. prep.	6.06w	130,125

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.17	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.33	$0.00	$0.00	$0.00	$0.00
25	PERMIT SUB	0	$20,000.00	$0.00	$0.00	$20,000.00

137	NESHAPS permitting	20w	136

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.01	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.05	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
139	RCRA appl. prep.	10w	130,122

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.1	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.33	$0.00	$0.00	$0.00	$0.00
25	PERMIT SUB	0	$50,000.00	$0.00	$0.00	$50,000.00
30	PERMIT FEE	0	$24,000.00	$0.00	$0.00	$24,000.00

ID	Name	Duration	Predecessors
140	RCRA permitting	52.5w	139

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.02	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.04	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
142	STATE air appl.	6.06w	130,125

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.17	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.33	$0.00	$0.00	$0.00	$0.00
25	PERMIT SUB	0	$20,000.00	$0.00	$0.00	$20,000.00

ID	Name	Duration	Predecessors
143	STATE air permitted	20w	142

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.01	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.05	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
146	review waste & bench scale data	2d	130,98

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
147	review TITLE I	2d	146,109,110

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
148	ID hazards/perform FMEA	1w	147

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
149	prepare PHA	1w	148

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.4	$0.00	$0.00	$0.00	$0.00
18		0	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
150	DOE review	4w	149

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.05	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.25	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
151	resolve comments	1w	150

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.4	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.2	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
153	prepare task scope	3d	151

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
154	process through MAT	6.07w	153

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.07	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
155	review proposals	2w	154

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
156	release task	1w	155

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
157	prepare draft PSAR	12w	156

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.1	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
26	SAR SUB	0	$50,000.00	$0.00	$0.00	$50,000.00

ID	Name	Duration	Predecessors
158	draft review	2w	157

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.5	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
159	prepare final PSAR	4w	158,122

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.1	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
160	review final PSAR	1w	159

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.6	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
161	DOE review	6w	160
162	resolve comments	2w	161

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
164	update descriptions/info	2w	162,122

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.3	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.3	$0.00	$0.00	$0.00	$0.00
26	SAR SUB	0	$22,000.00	$0.00	$0.00	$22,000.00

ID	Name	Duration	Predecessors
165	update analysis	2w	164

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.3	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
166	update document	1w	165

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.4	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.4	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
167	DOE review	6w	166
168	resolve DOE comments	2w	167

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.2	$0.00	$0.00	$0.00	$0.00
21	HS-3 STAFF	0.2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
170	develop SOPs	2w	164SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.6	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
171	LANL reviews	8w	170
172	incorporate comments into SOP	2w	171

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
175	review title I and II design	1w	170SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.6	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
176	summarize essential information	1w	175

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.6	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
178	start up/shut down procedures	3w	176

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.5	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
179	general procedures	3w	178

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.5	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
180	safety/emergency procedures	1w	179

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1.2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
181	implement document	0d	180
184	operating site doc.	3.03w	134,140,143,122

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.33	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
185	prepare site	8w	184

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.05	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.13	$0.00	$0.00	$0.00	$0.00
28	JCI	0	$25,000.00	$0.00	$0.00	$25,000.00

ID	Name	Duration	Predecessors
187	prepare spec package	2w	122

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.5	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
188	process through MAT	10w	187

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.06	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
189	review proposals	2w	188

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
190	release purchase order	2w	189,134,140,143
191	fabricate skids	26w	190

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
192	QA inspection	1w	191SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
193	acceptance inspection	1w	191

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
194	shipping	3w	193

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.14	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.14	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
196	set skids	1d	194

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
197	hook up utilities	1w	196

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
201	define test	1d	191SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
202	identify test conditions	2d	201

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
203	prepare test	1w	202

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1.2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
204	document	2d	203

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
205	order run supplies	1w	204

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00
29	MAT'L & SUPPLIES	0	$65,000.00	$0.00	$0.00	$65,000.00

ID	Name	Duration	Predecessors
206	assemble test crew	1d	193SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
207	schedule test runs	2d	205,206,197

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
208	prepare equipment	1w	207

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
209	train crew	1w	208

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
211	test equipment on water	2w	209

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
212	test equipment on cold waste	1w	211

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00
23	ANALYTICAL SUB	0	$4,000.00	$0.00	$0.00	$4,000.00

ID	Name	Duration	Predecessors
213	investigate different operating conditions	5w	212

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
214	clean up	1w	213

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

D	Name	Duration	Predecessors
216	analyze test data	12w	213SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.37	$0.00	$0.00	$0.00	$0.00

217	correct problems	7w	213SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
16	EM-7 OTHER	0.6	$0.00	$0.00	$0.00	$0.00

218	document results	2w	216

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.5	$0.00	$0.00	$0.00	$0.00

222	define test objectives	1d	218

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

223	identify test conditions/parameters	2d	222

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

224	prepare test plan	1w	223

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1.2	$0.00	$0.00	$0.00	$0.00

225	documentation	2d	224

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	1	$0.00	$0.00	$0.00	$0.00

226	schedule test runs	2d	225

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00

227	prepare equipment	1w	226

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.6	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00

229	run equipment check	3d	227,217

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00
17	HS-1 OTHER	1	$0.00	$0.00	$0.00	$0.00

230	run test with hot waste	5w	229

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.52	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00
17	HS-1 OTHER	1	$0.00	$0.00	$0.00	$0.00
23	ANALYTICAL SUB	0	$27,000.00	$0.00	$0.00	$27,000.00

231	clean up and decontamination	1w	230

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.4	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	2	$0.00	$0.00	$0.00	$0.00
17	HS-1 OTHER	1	$0.00	$0.00	$0.00	$0.00

232	wrap	1d	231

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	1	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	3	$0.00	$0.00	$0.00	$0.00
17	HS-1 OTHER	1	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
234	analyze test data	12w	230SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.37	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
235	correct problems	7w	230SS

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
16	EM-7 OTHER	0.6	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
236	document results	2w	234

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.5	$0.00	$0.00	$0.00	$0.00
16	EM-7 OTHER	0.5	$0.00	$0.00	$0.00	$0.00

ID	Name	Duration	Predecessors
237	ready to go!	0d	236,235,231
240	preparation	14w	122

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.08	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	1	$0.00	$0.00	$0.00	$0.00
24	NEPA SUB	0	$50,000.00	$0.00	$0.00	$50,000.00

ID	Name	Duration	Predecessors
241	permitting	52w	240

ID	Resource Name	Units	Cost	Plan Cost	Act. Cost	Rem. Cost
1	EM-7 STAFF	0.02	$0.00	$0.00	$0.00	$0.00
20	EM-8 STAFF	0.04	$0.00	$0.00	$0.00	$0.00

Appendix D
Cost Estimate For Skid Fabrication:
Cost Of Skid Built Entirely Of Stainless Steel

Appendix D2
Estimate Summary

MTO: Estimating
EST: David Champion
JOB NO: (RMP#) 7810-0009
DWG # Conceptual Design

THE RALPH M. PARSONS COMPANY

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO
GENERIC WASTE TREATMENT SKID
ESTIMATE No. 2, WITH STAINLESS STEEL PIPING AND EQUIPMENT

September 28, 1992
18 21 16
file: 7810SK04 WK1

CSI NO.:	DESCRIPTION	MATL COST	MAN/HOURS COST	LABOR COST	CONST EQUIP COST	OTHER COST	TOTAL DIRECT $
*	CATEGORY (001) FILTER SKID	32,987	511	15,525	1,519	0	50,031
	CATEGORY (002) GAS SCRUBBER SKID	47,966	761	23,028	1,514	0	72,508
	CATEGORY (003) REACTOR SKID	107,219	840	25,409	1,730	0	134,358
	CATEGORY (004) ELECTRIC POWER, HOOKUPS, ETC. (For All Skids)	6,461	255	7,559	0	0	14,020
	CATEGORY (005) INSTRUMENTATION & CONTROLS (For All Skids)	114,354	778	22,832	0	0	137,186
*	(Adjustments Are Made for Rounding Errors)						
**	(Assumed Prime Contractor Is A)						
	(Mech / Specility Contractor)						
	Subtotal	308,987	3,145	94,353	4,763	0	408,103
	WAREHOUSE/MATERIAL HANDLING (3.5%)	10,815	110	3,302	167		14,284
	MISC L&M (L: = +10%)(M: =$1.50/HR)	5,189	315	9,435			14,625
**	SUBCONTRACTOR OH & P (15+15%)	38,963		9,801	0		48,764
	Categories (004 & 005)						
	Total Cost To Prime	363,954	3,570	116,892	4,930	0	485,775
	PRIME CONTRACTOR OH & PROFIT (10 + 10%)						102,013
	Subtotal (Construction Contract Value, Not Including,)						587,788
	(Taxes, Bond, Escalation, & Contengency)						
	GROSS RECEIPTS TAX (6.06%)						
	Subtotal						
	BOND (1.5%)						
	Subtotal						
	COST GROWTH FROM 10/92 TO 10/94 , VALUE (8.78%)						
	Subtotal						
	CONTIGENCY (25%)						
	CURRENT ESTIMATE TOTAL						

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

ESTIMATE SUMMARY

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:14
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
ESTIMATE SUMMARY									
TOTAL DIRECT COSTS			308,987	3,145	94,353	180	4,763	0	408,
TOTAL JOB COST									$ 408,

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

ESTIMATE SUMMARY

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:14 am
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.PE

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION SUMMARY									
5 METALS			25,323	177	7,128	81	816	0	$ 33,26
9 FINISHES			243	108	2,241	0	0	0	$ 2,48
11 EQUIPMENT			145,355	747	22,264	99	3,516	0	$ 171,13
15 MECHANICAL			17,248	1,080	32,327	0	432	0	$ 50,00
16 ELECTRICAL			120,815	1,033	30,398	0	0	0	$ 151,20
ACCUMULATED ROUNDING ERRORS			3		(5)		(1)		(
TOTAL DIRECT COSTS			308,987	3,145*	94,353	180*	4,763	0	$ 408,10

Appendix D3
Estimate Subdivision Summary

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:11
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.

ITEM DESCRIPTION			QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 5 METALS											
51.200 Structural steel	CATEGORY (001)	Filter Skid			8,441	59 MH	2,376	27 HR	272		$ 11,0
51.200 Structural steel	CATEGORY (002)	Gas Scrubber			8,441	59 MH	2,376	27 HR	272		$ 11,0
51.200 Structural steel	CATEGORY (003)	Reactor Skid			8,441	59 MH	2,376	27 HR	272		$ 11,0
SUBTOTAL Structural steel					25,323*	177*	7,128*	81*	816*	0*	$ 33,2

RALPH M. PARSONS COMPANY

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

DATE October 30, 1992 10:11
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.PE

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 9 FINISHES									
99.208 Coatings&paints CATEGORY (001) Filter Skid			81	36 MH	747				$ 828
99.208 Coatings&paints CATEGORY (002) Gas Scrubber			81	36 MH	747				$ 828
99.208 Coatings&paints CATEGORY (003) Reactor Skid			81	36 MH	747				$ 828
SUBTOTAL Coatings&paints			243*	108*	2,241*	0*	0*	0*	$ 2,484

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

SHEET 5 OF
DATE October 30, 1992 10:1
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 11 EQUIPMENT									
115.005 Equipment installation CATEGORY (001) Filter Skid			14,082	155 MH	4,575	31 MH	1,032		$ 19,
115.005 Equipment installation CATEGORY (002) Gas Scrubber			37,058	177 MH	5,285	34 HR	1,242		$ 43,
115.005 Equipment installation CATEGORY (003) Reactor Skid			94,215	415 MH	12,404	34 HR	1,242		$ 107,
SUBTOTAL Equipment installation			145,355*	747*	22,264*	99*	3,516*	0*	$ 171,

RALPH M. PARSONS COMPANY

CSI · SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:12 a
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.PE

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 15 MECHANICAL									
159.120 PROCESS PIPE, S.S. CATEGORY (001) Filter Skid			1,246	102 MH	3,021		216		$ 4,484
159.120 PROCESS PIPE, S.S. CATEGORY (002) Gas Scrubber			1,072	402 MH	12,034				$ 13,106
159.120 PROCESS PIPE, S.S. CATEGORY (003) Reactor Skid			2,203	131 MH	3,924		216		$ 6,345
SUBTOTAL PROCESS PIPE, S.S.			4,521*	635*	18,979*	0*	432*	0*	$ 23,935
159.300 PROCESS PIPE, SPECILITIES CATEGORY (001) Filter Skid			9,134	159 MH	4,806				$ 13,938
159.300 PROCESS PIPE, SPECILITIES CATEGORY (002) Gas Scrubber			1,314	87 MH	2,587				$ 3,900
159.300 PROCESS PIPE, SPECILITIES CATEGORY (003) Reactor Skid			2,279	199 MH	5,955				$ 8,235
SUBTOTAL PROCESS PIPE, SPECILITIES			12,727*	445*	13,348*	0*	0*	0*	$ 26,073
TOTAL CSI DIV 15 MECHANICAL			17,248*	1,080*	32,327*	0*	432*	0*	$ 50,00

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:12
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GEMWAS4.

ITEM DESCRIPTION			QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 16 ELECTRICAL											
168.100 Special systems	CATEGORY (005)	Instrumentation And Control			114,354	778 MH	22,838				$ 137,1
169.100 Pwr trn and dstr	CATEGORY (004)	Electrical Power, Hook Ups, Etc. F			6,461	255 MH	7,560				$ 14,0
TOTAL CSI DIV 16 ELECTRICAL					120,815*	1,033*	30,398*	0*	0*	0*	$ 151,2

Appendix D4
Estimate Detail By Category

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:0
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (001) Filter Skid									
CSI DIVISION 5 METALS									
51.200 Structural steel									
STRUCTURAL STEEL, S.S.	.6	TN	11806.20						$ 6.
INCLUDES SHOP FABRICATION/DWG'S/ETC			6,848						
SQ STR.TUBING 4 X 4 X 1/4"S.S.	4.0	EA	304.53						$ 1
4 EA X 12 LF = 48 LF			1,218						
WELDING CONNECTIONS	1.0	LS	374.80	59.406	40.00	27.200	10.00		$ 3
Labor Is Shop Rate			375	59 MH	2,376	27 HR	272		
TOTAL 51.200 Structural steel			8,441*	59*	2,376*	27*	272*	0*	$ 11
TOTAL DIV 5 METALS			8,441*	59*	2,376*	27*	272*	0*	$ 11

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (001)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:0
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 9 FINISHES									
99.208 Coatings&paints									
PAINT, 2 PART EPOXY TYPE Included For Touch Up @ Equip. And Other Misc. Required Painting. (I.E.) Electrical.	1.0	LS	80.58 81	36.004 36 MH	20.75 747				$
TOTAL 99.208 Coatings&paints			81*	36*	747*	0*	0*	0*	$
TOTAL DIV 9 FINISHES			81*	36*	747*	0*	0*	0*	$

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:05
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.1

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (001)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 11 EQUIPMENT									
115.005 Equipment installation									
FILTER 15 GALLON	1.0	EA	6821.36	28.803	29.96				
36" x 28" X41", SEALED CARTRIDGE, ONE MICRON RATING			6,821	29 MH	863				$ 7,6
5 GPM									
PLATE HX	1.0	EA	2061.40	10.801	29.96				
13" X 30" x 37"			2,061	11 MH	324				$ 2,
PUMP P6 20" X 20" X 40"	1.0	EA	3748.00	43.204	29.96				
REGULAR FOR WATER			3,748	43 MH	1,294				$ 5,
AIR OPERATED DIAPHRAGM FEED PUMP, EXPLOSION PROOF,									
30 GPM, 15 HP MOTOR									
FILTER SKID INSTALL & HOOKUP	1.0	LS		43.204	29.96				
				43 MH	1,294				$ 1,
CRANE 25 IN HYDRAULIC	1.0	LS		9.001	22.99	9.001	70.00		
				9 MH	207	9 MH	630		$
MISC INSTALLATION MATERIALS	1.0	LS	562.20						
			562						$
FORK LIFT	1.0	LS		19.802	29.96	22.000	18.25		
				20 MH	593	22 HR	402		$
FREIGHT TO LANL	1.0	LS	890.15						
			890						$
TOTAL 115.005 Equipment installation			14,082*	155*	4,575*	31*	1,032*	0*	$ 19,
TOTAL DIV 11 EQUIPMENT			14,082*	155*	4,575*	31*	1,032*	0*	$ 19,

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (001)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:0
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 15 MECHANICAL									
159.120 PROCESS PIPE, S.S.									
1" S.S., SCH 40S, 150#	26.0	LF	8.36 217	.450 12	MH	29.96 351			$
1 1/2" S.S., SCH 40S, 150#	8.0	LF	12.54 100	.450 4	MH	29.96 108			$
2" S.S., SCH 40S, 150#	4.0	LF	15.68 63	.450 2	MH	29.96 54			$
SUPPORTS	1.0	LS	524.72 525	27.003 27	MH	29.96 809			$ 1
TEST AND CLEAN	1.0	LS	84.33 84	28.803 29	MH	29.96 863			$
SCAFFOLDING	1.0	LS		9.001 9	MH	29.96 270	216.00 216		$
TEFLON COATING ALLOW	48.0	LF	2.09 100	.300 14	MH	29.96 431			$
2" S.S, 150 #	10.0	LF	15.68 157	.450 5	MH	29.96 135			$
TOTAL 159.120 PROCESS PIPE, S.S.			1,246*	102*		3,021*	0*	216*	0* $ 4
159.300 PROCESS PIPE, SPECILITIES									
90 DEG ELBOW - 1"	8.0	EA	12.54 100	2.520 20	MH	29.96 604			$
90 DEG ELBOW - 2"	1.0	EA	31.34 31	6.301 6	MH	29.96 189			$
FLANGES 1"	10.0	EA	36.57 366	2.520 25	MH	29.96 755			$
FLANGES 1 1/2"	2.0	EA	41.79 84	3.600 7	MH	29.96 216			$
FLANGES 2"	10.0	EA	52.24 522	3.600 36	MH	29.96 1,079			$
GATE VALVE 2"	2.0	EA	261.19 522	4.111 	MH	29.96 15			$
CONTROL VALVE 1"	2.0	EA	3134.27 6,269	2.700 5	MH	29.96 162			$
DRAIN VALVE 3/4"	5.0	EA	104.48 522	1.800 9	MH	29.96 270			$
BOLT-UPS 1"	5.0	EA	4.69 23	.720 4	MH	29.96 108			$
BOLT-UPS 1 1/2"	1.0	EA	4.69 5	.810 1	MH	29.96 24			$

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (001)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:00
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
BOLT-UPS 2"	5.0	EA	6.56 33	1.080 5 MH	29.96 162				$
90 DEG ELBOW - 2" S.S.	2.0	EA	31.35 63	6.301 13 MH	29.96 378				$
FLANGES 2" - S.S.	6.0	EA	52.24 313	3.600 22 MH	29.96 647				$
GATE VALVE 2" - S.S.	1.0	EA	261.19 261	3.330 3 MH	29.96 100				$
BOLT-UPS 2" - S.S.	3.0	EA	6.56 20	1.080 3 MH	29.96 97				$
TOTAL 159.300 PROCESS PIPE, SPECILITIES			9,134*	159*	4,806*	0*	0*	0*	$ 13,
TOTAL DIV 15 MECHANICAL			10,380*	261*	7,827*	0*	216*	0*	$ 18,
TOTAL CATEGORY (001)			32,984*	511*	15,525*	58*	1,520*	0*	$ 50,

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:0
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (002)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (002) Gas Scrubber									
CSI DIVISION 5 METALS									
51.200 Structural steel									
STRUCTURAL STEEL, S.S.	.6	TN	11806.20						$ 6
INCLUDES SHOP FABRICATION/DWG'S/ETC			6,848						
SQ ST.TUBING 4 X 4 X 1/4" S.S.	4.0	EA	304.53						$ 1
4 EA X 12 LF = 48 LF			1,218						
WELDING CONNECTIONS	1.0	LS	374.80	59.406	40.00	27.200	10.00		$ 3
Labor Is Shop Rate			375	59 MH	2,376	27 HR	272		
TOTAL 51.200 Structural steel			8,441*	59*	2,376*	27*	272*	0*	$ 11
TOTAL DIV 5 METALS			8,441*	59*	2,376*	27*	272*	0*	$ 11

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (002)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 9 FINISHES									
99.208 Coatings&paints									
PAINT, 2 PART EPOXY TYPE Included For Touch Up @ Equip. And Other Misc. Required Painting. (I.E.) Electrical	1.0	LS	80.58 81	36.004 36 MH	20.75 747				$
TOTAL 99.208 Coatings&paints			81*	36*	747*	0*	0*	0*	$
TOTAL DIV 9 FINISHES			81*	36*	747*	0*	0*	0*	$

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (002)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COSTS
CSI DIVISION 11 EQUIPMENT									
115.005 Equipment installation									
GAS SCRUBBER 3'X5'X7'	1.0	EA	18740.00	58.506	29.96				
TANK 2' DIAM X 5' HT - 55 GAL			18,740	59 MH	1,753				$ 20
100 CFM, VENTURI									
EXPLOSION PROOF									
PUMP P5 20" X 20" X 40"	1.0	EA	14992.00	32.403	29.96				
HASTELLOY, 15 GPM, EXPLOSION PROOF, DIAPHRAGM,			14,992	32 MH	971				$ 15
5 HP MOTOR									
BLOWER 15" X 15" X 20"	1.0	EA	1874.00	13.501	29.96				
100 CFM, 5" W.C.S.P.			1,874	14 MH	404				$ 2
EXPLOSION PROOF									
GAS SCR SKD INSTALL & HOOKUP	1.0	LS		43.204	29.96	3.000	70.00		
				43 MH	1,294	3 HR	210		$ 1
CRANE 25 TN HYDRAULIC	1.0	LS		9.001	29.96	9.001	70.00		
				9 MH	270	9 MH	630		$
MISC INSTALLATION MATERIALS	1.0	LS	562.20						
			562						$
FORK LIFT	1.0	LS		19.802	29.96	22.000	18.25		
				20 MH	593	22 HR	402		$
FREIGHT TO LANL	1.0	LS	890.15						
			890						$
TOTAL 115.005 Equipment installation			37,058*	177*	5,285*	34*	1,242*	0*	$ 4
TOTAL DIV 11 EQUIPMENT			37,058*	177*	5,285*	34*	1,242*	0*	$ 4

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:07
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (002)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 15 MECHANICAL									
159.120 PROCESS PIPE, S.S.									
2" S.S., SCH 40S, 150#	2.0	LF	15.68	.450	29.96				
			31	1	MH 27				$
1 1/2" S.S., SCH 40S, 150#	4.0	LF	12.54	.450	29.96				
			50	2	MH 54				$
SUPPORTS	1.0	LS	524.72	27.003	29.96				
			525	27	MH 809				$ 1,
TEST AND CLEAN	1.0	LS	84.33	28.803	29.96				
			84	29	MH 863				$
SCAFFOLDING	1.0	LS		9.001	29.96				
				9	MH 270				$
TEFLON COATING ALLOW	15.0	LF	2.09	21.602	29.96				
			31	324	MH 9,708				$ 9,
1 1/2" S.S., 150 #	3.0	LF	12.54	.450	29.96				
			38	1	MH 40				$
4" S.S., 150 #	6.0	LF	52.24	1.460	29.96				
			313	9	MH 263				$
TOTAL 159.120 PROCESS PIPE, S.S.			1,072*	402*	12,034*	0*	0*	0*	$ 13,
159.300 PROCESS PIPE, SPECILITIES									
90 DEG ELBOWS - 1 1/2"	1.0	EA	31.34	3.600	29.96				
			31	4	MH 108				$
FLANGES 1 1/2"	2.0	EA	41.79	3.600	29.96				
			84	7	MH 216				$
FLANGES 2"	2.0	EA	52.24	3.600	29.96				
			104	7	MH 216				$
DRAIN VALVE 3/4"	3.0	EA	104.48	1.800	29.96				
			313	5	MH 162				$
BOLT-UPS 1 1/2"	1.0	EA	4.69	.810	29.96				
			5	1	MH 24				$
BOLT-UPS 2"	1.0	EA	6.56	1.080	29.96				
			7	1	MH 32				$
90 DEG ELBOW - 1 1/2" - S.S.	3.0	EA	31.34	3.600	29.96				
			94	11	MH 324				$
90 DEB ELBOW - 4" S.S.	2.0	EA	128.14	10.801	29.96				
			256	22	MH 647				$
FLANGES 1 1/2" - S.S.	4.0	EA	41.79	3.600	29.96				
			167	14	MH 431				$
FLANGES 4" - S.S.	2.0	EA	114.93	5.401	29.96				
			230	11	MH 324				$

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

SHEET 10 OF

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

JOB SIZE NA
CATEGORY (002)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTA COST
BOLT-UPS 4" - S.S.	1.0	EA	14.06	1.800	29.96				
			14	2 MH	54			$	
BOLT-UPS 1 1/2" - S.S.	2.0	EA	4.69	.810	29.96				
			9	2 MH	49			$	
TOTAL 159.300 PROCESS PIPE, SPECILITIES			1,314*	87*	2,587*	0*	0*	0* $	3
TOTAL DIV 15 MECHANICAL			2,386*	489*	14,621*	0*	0*	0* $	17
TOTAL CATEGORY (002)			47,966*	761*	23,029*	61*	1,514*	0* $	72

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (003)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (003) Reactor Skid									
CSI DIVISION 5 METALS									
51.200 Structural steel									
STRUCTURAL STEEL, S.S.	.6	TN	11806.20						$ 6
INCLUDES SHOP FABRICATION/DWG'S/ETC			6,848						
SQ ST TUBING 4 X 4 X 1/4" S.S.	4.0	EA	304.53						$ 1
4 EA X 12 LF = 48 LF			1,218						
WELDING CONNECTIONS	1.0	LS	374.80	59.406	40.00	27.200	10.00		
Labor Is Shop Rate			375	59 MH	2,376	27 MH	272		$ 3
TOTAL 51.200 Structural steel			8,441*	59*	2,376*	27*	272*	0*	$ 11
TOTAL DIV 5 METALS			8,441*	59*	2,376*	27*	272*	0*	$ 11

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (003)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COSTS
CSI DIVISION 9 FINISHES									
99.208 Coatings&paints									
PAINT, 2 PART EPOXY TYPE Included for Touch Up @ Equip. And Other Misc. Required Painting. (I.E) Electrical.	1.0	LS	80.58 81	36.004 36 MH	20.75 747				$
TOTAL 99.208 Coatings&paints			81*	36*	747*	0*	0*	0*	$
TOTAL DIV 9 FINISHES			81*	36*	747*	0*	0*	0*	$

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (003)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

SHEET 13 OF
DATE October 30, 1992 10:0
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWASK

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 11 EQUIPMENT									
115.005 Equipment installation									
REACTOR 3'DIA X 6'HT HASTELLOY CLAD,6-8"DIAM HATCH, 4" RUPTURE DISC, 300 GAL CAP, CYLIN, TEFLON LINED, 15 PSI DES OVERPRESS, STRESS RELIEV, JACKETED, DISH SHAPED T & B, FIRE & EXPLOS PROOF	1.0	EA	37480.00 37,480	72.007 72 MH	29.96 2,157				$ 39,
PUMP P1 15" X 25" X 30" HASTELLOY, 1 GPM, EXPLOSION PROOF, DIAPHRAGM, 1 HP MOTOR	1.0	EA	4685.00 4,685	28.803 29 MH	29.96 863				$ 5,
PUMP P2 15" X 25" X 30" HASTELLOY, 1 GPM, EXPLOSION PROOF, DIAPHRAGM, 1 HP MOTOR	1.0	EA	4685.00 4,685	28.803 29 MH	29.96 863				$ 5
PUMP P3 20" X 20" X 40" HASTELLOY, 20 GPM, EXPLOSION PROOF, DIAPHRAGM, 10 HP MOTOR	1.0	EA	14992.00 14,992	75.608 76 MH	29.96 2,265				$ 17
PUMP P4 20" X 20" X 40" HASTELLOY, 30 GPM, EXPLOSION PROOF, DIAPHRAGM, 15 HP MOTOR	2.0	EA	14992.00 29,984	54.005 108 MH	29.96 3,236				$ 33
AGITATOR 10" X 10" X 15" EXPLOSION PROOF MOTOR	1.0	EA	937.00 937	28.803 29 MH	29.96 863				$ 1
REACTOR SKID INSTALL & HOOKUP	1.0	LS		43.204 43 MH	29.96 1,294	3.000 3 HR	70.00 210		$ 1
CRANE 25 TN HYDRAULIC	1.0	LS		9.001 9 MH	29.96 270	9.001 9 MH	70.00 630		$
MISC INSTALLATION MATERIALS	1.0	LS	562.20 562						$
FORK LIFT	1.0	LS		19.802 20 MH	29.96 593	22.000 22 HR	18.25 402		$
FREIGHT TO LANL	1.0	LS	890.15 890						$
TOTAL 115.005 Equipment installation			94,215*	415*	12,404*	34*	1,242*	0*	$ 10
TOTAL DIV 11 EQUIPMENT			94,215*	415*	12,404*	34*	1,242*	0*	$ 10

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (003)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COSTS
CSI DIVISION 15 MECHANICAL									
159.120 PROCESS PIPE, S.S.									
1" S.S., SCH 40S, 150#	20.0	LF	8.36 167	.450 9 MH	29.96 270				$
1 1/2" S.S., SCH 40S, 150#	12.0	LF	12.54 150	.450 5 MH	29.96 162				$
2" S.S., SCH 40S, 150#	17.0	LF	15.68 266	.450 8 MH	29.96 229				$
SUPPORTS	1.0	LS	524.72 525	27.003 27 MH	29.96 809				$
TEST AND CLEAN	1.0	LS	84.33 84	28.803 29 MH	29.96 863				$
SCAFFOLDING	1.0	LS		9.001 9 MH	29.96 270		216.00 216		$
TEFLON COATING ALLOW	115.0	LF	2.09 240	.125 14 MH	29.96 431				$
1" S.S., 150 #	36.0	LF	8.36 301	.450 16 MH	29.96 485				$
2" S.S., 150 #	30.0	LF	15.68 470	.450 14 MH	29.96 405				$
TOTAL 159.120 PROCESS PIPE, S.S.			2,203*	131*	3,924*	0*	216*	0*	$
159.300 PROCESS PIPE, SPECIALITIES									
90 DEG ELBOW - 1"	3.0	EA	12.54 38	2.520 8 MH	29.96 227				$
90 DEG ELBOW - 1 1/2"	2.0	EA	31.35 63	4.545 9 MH	29.96 272				$
90 DEG ELBOW - 2"	6.0	EA	31.34 188	6.301 38 MH	29.96 1,133				$
45 DEG ELBOW - 1"	1.0	EA	12.54 13	2.520 3 MH	29.96 76				$
FLANGES 1"	6.0	EA	36.57 219	2.520 15 MH	29.96 453				$
FLANGES 1 1/2"	4.0	EA	41.79 167	3.600 14 MH	29.96 431				$
FLANGES 2"	8.0	EA	52.24 418	3.600 29 MH	29.96 863				$
DRAIN 3/4"	6.0	EA	93.70 562	1.800 11 MH	29.96 324				$
TRAP 3/4"	1.0	EA	88.83 89	3.150 3 MH	29.96 94				$

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (003)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:09
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
BOLT-UPS 1"	3.0	EA	4.69 14	.720 2 MH	29.96 65				$
BOLT-UPS 1 1/2"	2.0	EA	4.69 9	.810 2 MH	29.96 49				$
BOLT-UPS 2"	4.0	EA	6.56 26	1.080 4 MH	29.96 129				$
90 DEG ELBOW - 1" S.S.	4.0	EA	12.54 50	2.520 10 MH	29.96 302				$
90 DEG ELBOW - 2" S.S.	5.0	EA	31.34 157	6.301 32 MH	29.96 944				$ 1,
FLANGES 1" - S.S.	4.0	EA	36.57 146	2.520 10 MH	29.96 302				$
FLANGES 2" - S.S.	2.0	EA	52.24 104	3.600 7 MH	29.96 216				$
BOLT-UPS 1" - S.S.	2.0	EA	4.69 9	.720 1 MH	29.96 43				$
BOLT-UPS 2" - S.S.	1.0	EA	6.56 7	1.080 1 MH	29.96 32				$
TOTAL 159.300 PROCESS PIPE, SPECILITIES			2,279*	199*	5,955*	0*	0*	0*	$ 8
TOTAL DIV 15 MECHANICAL			4,482*	330*	9,879*	0*	216*	0*	$ 14
TOTAL CATEGORY (003)			107,219*	840*	25,406*	61*	1,730*	0*	$ 134

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:09
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (004)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (004) Electrical Power, Hook Ups, Etc. For All Three Skids Note: Skids For This Exercise Are Hooked In Tandem.									
CSI DIVISION 16 ELECTRICAL									
169.100 Pwr trn and dstr									
3/4" RGS PVC COATED AG	60.0	LF	1.63 98	.135 8	MH	29.55 239			$ 3
1 1/4" RGS PVC COATED AG	500.0	LF	2.67 1,335	.150 75	MH	29.55 2,217			$ 3,5
1 1/4" COND.SUPPORT & FITTINGS	500.0	LF	1.87 937	.113 56	MH	29.55 1,662			$ 2,5
3/4" GUAC STEEL W/ C&G	6.0	EA	18.23 109	.720 4	MH	29.55 128			$ 2
3/4" SEALTITE FLEX	20.0	LF	1.10 22	.124 2	MH	29.55 74			$
3/4" S/T FLEX CONN STR	16.0	EA	2.27 36	.158 3	MH	29.55 75			$
MISC STRAPS & FITTINGS 3/4"C.	1.0	LS	23.43 23	5.401 5	MH	29.55 160			$
PANEL BOARD 100A / 480V THREE PHASE PANEL BOARD WITH 12-20 AMP CIRCUIT BREAKERS, NEMA 7 INCLUDING NECESSARY RELAYS	1.0	EA	2342.50 2,343	43.204 43	MH	29.55 1,277			$ 3,
1/C #10 AWG 600V XHHW STR	220.0	LF	.17 37	.013 3	MH	29.55 86			$
1/C #2 AWG 600V XHHW	2,100.0	LF	.61 1,279	.026 56	MH	29.55 1,642			$ 2,
WASTE ALLOW 160.00	1.0	LS	241.75 242						$
TOTAL 169.100 Pwr trn and dstr			6,461*	255*		7,560*	0*	0*	0* $ 1
TOTAL DIV 16 ELECTRICAL			6,461*	255*		7,560*	0*	0*	0* $ 1
TOTAL CATEGORY (004)			6,461*	255*		7,560*	0*	0*	0* $ 1

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:09
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS4.P

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

JOB SIZE NA
CATEGORY (005)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (005) Instrumentation And Control Note: Exposed Material To Be PVC Coated									
CSI DIVISION 16 ELECTRICAL									
168.100 Special systems									
REACTOR H2 ANALYZER SENSOR AE-001 · ANALYZING ELEMENT - MSA H2 MODEL #487811 PART OF AT - 001	1.0	EA		1.800 2 MH	29.55 53			$	
BUILDING VENT STACK GAS ANAL SENSOR (H2, CL, H2S) AE - 003 - ANALYZING ELEMENT - MSA 5000 SERIES SYSTEM PART OF AT - 003	1.0	EA		1.800 2 MH	29.55 53			$	
REACTOR H2 ANALYZER TRANSMIT. AT - 001 - ANALYZER TRANSMITTER - MSA H2 MODEL # 487811 INCLUDES AE - 001	1.0	EA	562.20 562	7.201 7 MH	29.55 213			$	7
REACTOR RECYCLE SOLUTION P/H ANALYZER TRANSMITTER AT - 002 - ANALYZER TRANSMITTER - FOXBORO 870 TRANSMITTER AND 871 SENSOR WITH ACCESSORIES - FOXBORO (IA) SERIES	1.0	EA	1405.50 1,406	9.001 9 MH	29.55 266			$	1,6
BUILDING VENT STACK GAS ANAL AT - 003 - ANALYZER TRANSMITTER - MSA SERIES 5000 SYSIEM MONITOR FOR H2, H2S, & CL2, WITH ALARM CAPABILITIES	1.0	EA	4685.00 4,685	36.004 36 MH	29.55 1,064			$	5,7
REACTOR H2 CONTROL (DILUTION AREA) - AV - 001 · ANALYZER CONTROL VALVE · FISHER - 4" BUTTERFLY SS DISC. INCLUDES ACTUATOR AND ELECTRO-PNEUMATIC POSITIONER	1.0	EA	2436.20 2,436	13.501 14 MH	29.55 399			$	2,8
INTRINSIC BARRIER (X-PURGE) CP # 1 - ENCLOSURE - HOFFMAN	1.0	EA		3.600 4 MH	29.55 106			$	
FIELD BUS MODULE CP # 2 - ENCLOSURE - FOXBORO FE - 8 - ENCLOSURE WITH (FBM - 01, 04, 17D) - MODULES - FBM-01 2 EA $2.6K - FBM-04 1 EA $1.3K, FBM-17 1 EA $1.3K, FE-8 1 EA $7.5K	1.0	EA	11899.90 11,900	9.001 9 MH	29.55 266			$	12,
PROCESS CONTROL COMPUTER CP # 3 - PROCESS COMPUTER - FOXBORO SUPPLIED COMPUTER PLUS FOXBORO (IAS) INTEGRATED CONTROL SOFTWARE	1.0	EA	44039.00 44,039	22.502 23 MH	29.55 665			$	44,
HEPA FILTER D/P TRANSMITTER DPT - 001 · DIFFERENTIAL PRESSURE TRANSMITTER · FOXBORO 823 D/P - FOXBORO (IA) SERIES	1.0	EA	1124.40 1,124	13.501 14 MH	29.55 399			$	1,
FILTER D/P TTRANSMITTER DPT - 002 - DIFFERENTIAL PRESSURE TRANSMITTER - FOXBORO 823 D/P - FOXBORO (IA) SERIES	1.0	EA	1124.40 1,124	13.501 14 MH	29.55 399			$	1,
REAGENT FLOW SENSOR FE - 001 - FLOW ELEMENT - MICRO MOTION CMF - 025 NOT AVAILABLE IN HASTELOY YET	1.0	EA	3279.50 3,280	4.500 5 MH	29.55 133			$	3,

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN

JOB SIZE NA
CATEGORY (005)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COSTS
P/H SOLUTION FLOW SENSOR	1.0	EA	3279.50	4.500	29.55				
FE - 002 - FLOW ELEMENT - MICRO MOTION CMF - 025			3,280	5	MH 133				$
NOT AVAILABLE IN HASTELOY YET									
SCRUBBER SOLUTION FLOW ORIFICE	1.0	EA	2998.40	4.500	29.55				
FE - 003 - FLOW ELEMENT - FOXBORO IFOA - HASTELOY			2,998	5	MH 133				$
REAGENTS TO REACTOR FLOW TRNMT	1.0	EA	2811.00	7.201	29.55				
FT - 001 - FLOW TRANSMITTER - MICRO MOTION RFT - 9739			2,811	7	MH 213				$
P/H SOLUTION TO REACT FLW TRM	1.0	EA	2811.00	7.201	29.55				
FT - 002 - FLOW TRANSMITTER - MICRO MOTION RFT - 9739			2,811	7	MH 213				$
SCRUBBER SOLUTION FLOW TRANSMT	1.0	EA	1124.40	13.501	29.55				
FT - 003 - FLOW TRANSMITTER - FOXBORO 823 DP			1,124	14	MH 399				$
FOXBORO (IA) SERIES									
REACTOR COOLANT/HEATING HOSWIT	1.0	EA	140.55	1.800	29.55				
HS - 001 - HAND SWITCH - ALLEN BRADLEY			141	2	MH 53				$
EXP TANK LEVEL GAUGE GLASS	1.0	EA	937.00	8.101	29.55				
LG - 002 - LEVEL GAUGE GLASS - PENBERTHY MODEL 2TL - 7			937	8	MH 239				$
24" SS WETTED PARTS									
SCRUBBER LIQUID LEVEL GAUG GLS	1.0	EA	1405.50	11.701	29.55				
LG - 003 LEVEL GAUGE GLASS - PENBERTHY MODEL 3TL - 7			1,406	12	MH 346				$
48" SS WETTED PARTS									
REACTOR LEVEL TRANSMITTER	1.0	EA	1124.40	13.501	29.55				
LT - 001 - LEVEL TRANSMITTER - FOXBORO 823 D/P			1,124	14	MH 399				$
FOXBORO (IA) SERIES - HASTELOY									
REACTOR PRESSURE CONTROL	1.0	EA	2436.20	13.501	29.55				
PCV - 001 - PRESSURE CONTROL VALVE - FISHER			2,436	14	MH 399				$
4" BUTTERFLY SS DISC - INCLUDES ACTUATOR AND									
ELECTRO - PNEAUMATIC POSITIONER									
REACTOR PRESSURE INDICATOR	1.0	EA	702.75	2.070	29.55				
PG - 001 - PRESSURE INDICATOR - ASHCROFT MODEL 1009 3.5 "			703	2	MH 61				$
GAUGE - WITH PROCESS DIAPHGRAM SEAL									
EXPANSION TANK PRESSURE INDIC	1.0	EA	702.75	1.800	29.55				
PG - 002 - PRESSURE GAUGE - ASHCROFT MODEL 1009 3.5"			703	2	MH 53				$
GAUGE - WITH PROCESS DIAPHGRAM SEAL									
SCRUBBER PRESSURE INDICATOR	1.0	EA	702.75	1.800	29.55				
PG - 0003 - ASHCROFT MODEL 1009 3.5" GAUGE - WITH PROCESS			703	2	MH 53				$
DIAPHRAGM SEAL									
SCRUBBER SOLUTION PRESS INDIC	1.0	EA	702.75	1.800	29.55				
PG - 005 - PRESSURE GAUGE - ASHCROFT MODEL 1009 3.5"			703	2	MH 53				$
GAUGE - WITH PROCESS DIAPHGRAM SEAL									
REACTOR COOL PUMP DISCH PR IND	1.0	EA	702.75	1.800	29.55				
PG - 006 - PRESSURE GAUGE - ASHCROFT MODEL 1009 3.5"			703	2	MH 53				$
GAUGE - WITH PROCESS DIAPHGRAM SEAL									
REACTOR PRESSURE TRANSMITTER	1.0	EA	1124.40	7.201	29.55				
PT - 001 - PRESSURE TRANSMITTER - FOXBORO 821			1,124	7	MH 213				$
FOXBORO (IA) SERIES									
STEAM TO REAC PRESS TRANSMIT	1.0	EA	1124.40	7.201	29.55				
PT - 002 - PRESSURE TRANSMITTER - FOXBORO 821			1,124	7	MH 213				$
FOXBORO (IA) SERIES									

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GENERIC WASTE TREAT. S.S.

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
STAINLESS STEEL PIPING AND EQUIPMENT

DATE October 30, 1992 10:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

JOB SIZE NA
CATEGORY (005)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COSTS
SCRUBBER PRESSURE TRANSMITTER	1.0	EA	1124.40	7.201	29.55				
PT - 003 - PRESSURE TRANSMITTER - FOXBORO 821			1,124	7 MH	213				$
REACTOR COOLING SUPPLY (WATER)	1.0	EA	3279.50	7.201	29.55				
TCV - 001 - TEMPERATURE CONTROL VALVE - FISHER			3,280	7 MH	213				$
2" CAGE GUIDED GLOBE VALVE									
REACTOR HEAT SUPPLY (STEAM)	1.0	EA	3279.50	7.201	29.55				
TCV - 002 - TEMPERATURE CONTROL VALVE - FISHER			3,280	7 MH	213				$
2" CAGE GUIDED GLOBE VALVE									
REACTOR TEMP TRANSMITTER	1.0	EA	702.75	7.201	29.55				
TT - 001 - TEMPERATURE TRANSMITTER - FOXBORO 893			703	7 MH	213				$
INCLUDES TE - 001 - FOXBORO (IA) SERIES									
HEAT EXCH TUBE SIDE TEMP TRANS	1.0	EA	702.75	7.201	29.55				
TT - 002 - TEMPERATURE TRANSMITTER - FOXBORO 893			703	7 MH	213				$
INCLUDES TE - 002 - FOXBORO (IA) SERIES									
HEAT EXCH SHELL SIDE TEMP TRAN	1.0	EA	702.75	7.201	29.55				
TT - 003 - TEMPERATURE TRANSMITTER - FOXBORO 893			703	7 MH	213				$
INCLUDES TE - 003 - FOXBORO (IA) SERIES									
BULK MATERIALS - FOR VALVES	1.0	EA	9174.17	484.518	29.55				
AND INSTRUMENTS - PIPING & TUBING (AIR SUPPLY & PROCESS)			9,174	485 MH	14,318				$ 2
INSTRUMENT SUPPORTS - PIPING & TUBING SUPPORT SYSTEM									
ANALYZERS:SPECIAL EQUIPMENT ALLOW CALIBRATION & LOOP TEST									
TOTAL 168.100 Special systems			114,354*	778*	22,838*	0*	0*	0*	$ 13
TOTAL DIV 16 ELECTRICAL			114,354*	778*	22,838*	0*	0*	0*	$ 1
TOTAL CATEGORY (005)			114,354*	778*	22,838*	0*	0*	0*	$ 1

BULK MATERIAL SUMMARY

PROJECT
OPTION

PAGE 4400 - 1
BY
DATE October 29, 1992
TIME 1:43 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION												
4413 ANALYZER SYSTEMS		EA	.00	.00	.00	.00	6,500	0	0	150	750	7,250
4425 SUB HDR PIPE-MULT-SUPPORT	5	LS	.00	.00	.00	.00	1,570	0	0	48	1,401	2,971
4427 INSTRUMENT INSTALLATION MATERIAL	335	LF	4.96	.66	19.56	.00	1,662	0	0	222	6,554	8,216
4499 CALIBRATION AND TESTING	6	LS	.00	6.26	185.05	.00	0	0	0	119	3,516	3,516
CONSTRUCTION WASTE							59					59
ACCOUNT 4400 SUBTOTAL:		EA	.00	.00	.00	.00	$ 9,791	0	$ 0	538	$ 12,221	$ 22,012
LABOR PRODUCTIVITY ADJ 538 / 60 % =	897	MH			22.70					359	8,147	8,14
4400 INSTRUMENTATION		EA					$ 9,791	0	$ 0	897	$ 20,368	$ 30,15

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION													
4413 ANALYZER SYSTEMS													
ANALYZERS													
Special Allowance for Misc	1.0	1	ls	6500.00	150.00	750.00	.00	6,500	.0	0	150.0	750	7,250
----Small Valves,Brackets,Hardware,Extra Tubing,& Special Equipment etc.													
ANALYZERS			ea	.00	.00	.00	.00	6,500	.0	0	150.0	750	7,250
		2.20	Tons		Wage Rate:	5.00							
4413 ANALYZER SYSTEMS			EA	.00	.00	.00	.00	6,500	.0	0	150.0	750	7,25
		2.2	Tons		Wage Rate:	5.00							

BULK MATERIAL DETAIL

PROJECT

OPTION

BY
DATE October 29, 1992
TIME 1:41 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLAR
4400 INSTRUMENTATION													
4425 SUB HDR PIPE-MULT-SUPPORT													
INSTRUMENTS SUPPORTS													
D/P Transmitters/Indicators	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	4
Pressure/Temperature Xmitters	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	4
Flow/Pressure/Temp Controllers	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	4
Local Electronic Indicators	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	4
INSTRUMENTS SUPPORTS		12	ea	75.00	2.00	59.00	.00	900	.0	0	24.0	708	1,6
					Wage Rate:	29.50							
TUBING SUPPORTS													
Piping & Tubing Support System	335.0	335	lf	2.00	.07	2.07	.00	670	.0	0	23.5	693	1,3
TUBING SUPPORTS		335	ea	2.00	.07	2.07	.00	670	.0	0	23.5	693	1,3
		737	Tons		Wage Rate:	29.49							
4425 SUB HDR PIPE-MULT-SUPPORT		1	LS	.00	.00	.00	.00	1,570	.0	0	47.5	1,401	2,9
		737.0	Tons		Wage Rate:	29.49							

BULK MATERIAL DETAIL

PROJECT

OPTION

BY
DATE October 29, 1992
TIME 1:41 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT: MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION													
4427 INSTRUMENT INSTALLATION MATERIAL													
PIPE CS GALV													
1/2 inch Pipe Wld A120 Std Glv	100.0	100	lf	.60	.25	7.39	.00	60	.0	0	25.0	739	79
PIPE CS GALV		100	lf	.60	.25	7.39	.00	60	.0	0	25.0	739	79
				Wage Rate:		29.56							
TUBING A269 304													
1/2 inch Tubing 304ss A269 049	175.0	175	lf	2.25	.25	7.39	.00	394	.0	0	43.8	1,293	1,6
1/2 inch Tubing 304ss A269 049	20.0	20	lf	2.25	.25	7.40	.00	45	.0	0	5.0	148	19
TUBING A269 304		195	lf	2.25	.25	7.39	.00	439	.0	0	48.8	1,441	1,8
				Wage Rate:		29.53							
TUBING A260 316													
1/4 inch Tubing 316ss A260 030	40.0	40	lf	2.32	.25	7.40	.00	93	.0	0	10.0	296	3
TUBING A260 316		40	lf	2.33	.25	7.40	.00	93	.0	0	10.0	296	3
				Wage Rate:		29.60							
CS 3-WAY VALVE MANIFOLD													
1/4 inch 3Way Manifold Vlve CS	2.0	2	ea	95.55	1.50	44.50	.00	191	.0	0	3.0	89	2
CS 3-WAY VALVE MANIFOLD		2	ea	95.50	1.50	44.50	.00	191	.0	0	3.0	89	2
				Wage Rate:		29.67							
GATE VALVE CS													
1/2 inch Gate Valve CS	4.0	4	ea	28.35	.80	23.75	.00	113	.0	0	3.2	95	
1/2 inch Gate Valve CS	7.0	7	ea	28.35	.80	23.57	.00	198	.0	0	5.6	165	
GATE VALVE CS		11	ea	28.27	.80	23.64	.00	311	.0	0	8.8	260	
				Wage Rate:		29.55							
NEEDLE VALVE BRS													
1/4 inch Needle Valve Brass	4.0	4	ea	12.08	.80	23.75	.00	48	.0	0	3.2	95	
NEEDLE VALVE BRS		4	ea	12.00	.80	23.75	.00	48	.0	0	3.2	95	
				Wage Rate:		29.69							

BULK MATERIAL DETAIL

PROJECT

OPTION

BY
DATE October 29, 1992
TIME 1:42 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTA DOLLA
4400 INSTRUMENTATION													
4427 INSTRUMENT INSTALLATION MATERIAL													
NIPPLE CS A106													
1/2 inch x 3 inch Nipple CS XS	7.0	7	ea	1.37	1.00	29.57	.00	10	.0	0	7.0	207	2
1/2 inch x 3 inch Nipple CS XS	2.0	2	ea	1.37	1.00	29.50	.00	3	.0	0	2.0	59	
1/2 inch x 6 inch Nipple CS XS	2.0	2	ea	2.15	1.00	29.50	.00	4	.0	0	2.0	59	
NIPPLE CS A106		11	ea	1.55	1.00	29.55	.00	17	.0	0	11.0	325	3
				Wage Rate:		29.55							
NIPPLE CS GALV													
1/4 inch x 3 inch NippleCS Std	8.0	8	ea	.68	1.00	29.50	.00	5	.0	0	8.0	236	
NIPPLE CS GALV		8	ea	.63	1.00	29.50	.00	5	.0	0	8.0	236	
				Wage Rate:		29.50							
SWAGE NIPPLE CS A181													
3/4 x 1/2 Swage Nipple CS A181	4.0	4	ea	3.43	1.00	29.50	.00	14	.0	0	4.0	118	
3/4 x 1/2 Swage Nipple CS A181	7.0	7	ea	3.43	1.00	29.57	.00	24	.0	0	7.0	207	
SWAGE NIPPLE CS A181		11	ea	3.45	1.00	29.55	.00	38	.0	0	11.0	325	
				Wage Rate:		29.55							
90 ELL GALV CS													
1/2 inch 90 Ell CS A197 Scrd	8.0	8	ea	2.39	.50	14.75	.00	19	.0	0	4.0	118	
90 ELL GALV CS		8	ea	2.38	.50	14.75	.00	19	.0	0	4.0	118	
				Wage Rate:		29.50							
TEE CS A105													
1/2 inch Tee CS A105 Scrd	4.0	4	ea	3.65	.50	14.75	.00	15	.0	0	2.0	59	
1/2 inch Tee CS A105 Scrd	14.0	14	ea	3.65	.50	14.79	.00	51	.0	0	7.0	207	
1/2 inch Tee CS A105 Scrd	4.0	4	ea	3.65	.50	14.75	.00	15	.0	0	2.0	59	
TEE CS A105		22	ea	3.68	.50	14.77	.00	81	.0	0	11.0	325	
				Wage Rate:		29.55							

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION													
4427 INSTRUMENT INSTALLATION MATERIAL													
TEE GALV CS													
1/2 inch Tee CS A197 Scrd	4.0	4	ea	3.13	.50	14.75	.00	13	.0	0	2.0	59	72
TEE GALV CS		4	ea	3.25	.50	14.75	.00	13	.0	0	2.0	59	72
				Wage Rate:		29.50							
REDUCING TEE GALV CS													
1/2 x 1/4 Tee CS A197 Scrd	4.0	4	ea	3.59	.50	14.75	.00	14	.0	0	2.0	59	7
REDUCING TEE GALV CS		4	ea	3.50	.50	14.75	.00	14	.0	0	2.0	59	7
				Wage Rate:		29.50							
PLUG RND SLD STL													
1/2 inch Plug Round Solid Stl	4.0	4	ea	.58	1.00	29.50	.00	2	.0	0	4.0	118	12
1/2 inch Plug Round Solid Stl	14.0	14	ea	.58	1.00	29.57	.00	8	.0	0	14.0	414	42
1/2 inch Plug Round Solid Stl	4.0	4	ea	.58	1.00	29.50	.00	2	.0	0	4.0	118	12
PLUG RND SLD STL		22	ea	.55	1.00	29.55	.00	12	.0	0	22.0	650	66
				Wage Rate:		29.55							
PLUG GALV													
1/4 inch Plug A197 Galv	4.0	4	ea	.59	1.00	29.50	.00	2	.0	0	4.0	118	12
PLUG GALV		4	ea	.50	1.00	29.50	.00	2	.0	0	4.0	118	12
				Wage Rate:		29.50							
CONN MALE CS													
1/2 x 1/2 Male Connector CS	4.0	4	ea	3.37	1.00	29.50	.00	13	.0	0	4.0	118	1
CONN MALE CS		4	ea	3.25	1.00	29.50	.00	13	.0	0	4.0	118	1
				Wage Rate:		29.50							
CONN MALE 316													
1/4 x 1/4 Male Connector SS	16.0	16	ea	7.06	1.00	29.56	.00	113	.0	0	16.0	473	5
1/4 x 1/2 Male Connector SS	7.0	7	ea	8.10	1.00	29.57	.00	57	.0	0	7.0	207	2
1/2 x 1/2 Male Connector SS	21.0	21	ea	6.46	1.00	29.57	.00	136	.0	0	21.0	621	7
CONN MALE 316		44	ea	6.95	1.00	29.57	.00	306	.0	0	44.0	1,301	1,6
				Wage Rate:		29.57							
4427 INSTRUMENT INSTALLATION MATERIAL		335	LF	4.96	.66	19.56	.00	1,662	.0	0	221.8	6,554	8,2
CONSTRUCTION WASTE		34	LF	1.74				59					
				Wage Rate:		29.55							

BULK MATERIAL DETAIL

PROJECT

OPTION

BY
DATE October 29, 1992
TIME 1:42 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION													
4499 CALIBRATION AND TESTING													
Calibrate Field Mounted Instruments													
Control Valves	4.0	4	ea	.00	1.00	29.50	.00	0	.0	0	4.0	118	
Flow Instruments	3.0	3	ea	.00	5.00	147.67	.00	0	.0	0	15.0	443	
Pressure Instruments	6.0	6	ea	.00	4.00	118.17	.00	0	.0	0	24.0	709	
Temperature Instruments	3.0	3	ea	.00	4.00	118.33	.00	0	.0	0	12.0	355	
Analyzers	3.0	3	ea	.00	16.00	472.67	.00	0	.0	0	48.0	1,418	1,
Calibrate Field Mounted Instruments		19	ea	.00	5.42	160.16	.00	0	.0	0	103.0	3,043	3,
		42.74	Tons		Wage Rate:	29.54							
Loop Check													
Loop Check.	1.0	1	ls	.00	16.00	473.00	.00	0	.0	0	16.0	473	
Loop Check			ea	.00	.00	.00	.00	0	.0	0	16.0	473	
					Wage Rate:	29.56							
4499 CALIBRATION AND TESTING		1	LS	.00	6.26	185.05	.00	0	.0	0	119.0	3,516	3
		42.74	Tons		Wage Rate:	29.55							
SUBTOTAL:			EA	.00	.00	.00	.00	9,732	.0	0	538.3	12,221	21
CONSTRUCTION WASTE								59					
4400 INSTRUMENTATION		.0	EA	.00	.00	.00	.00	$ 9,791	.0 $	0	538.3	$ 12,221	$ 22
		781.94	Tons		Wage Rate:	22.70							

Appendix E
Cost Estimate For Skid Fabrication:
Cost Of Skid With The Structure Built
Of Stainless Steel And The Major
Components And Piping Of Titanium

Appendix E2
Estimate Summary

THE RALPH M. PARSONS COMPANY

September 28, 1992

MTO: Estimating
EST: David Champion
JOB NO. (RMP#) 7810-0009
DWG # Conceptual Design

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO
GENERIC WASTE TREATMENT SKID

18 37 56

[ESTIMATE No. 1, WITH TITANIUM STEEL PIPING AND EQUIPMENT]

file: 7810SK03 WK1

CSI NO.:	DESCRIPTION	MATL COST	MAN/HOURS COST	LABOR COST	CONST EQUIP COST	OTHER COST	TOTAL DIRECT $
*	CATEGORY (001) FILTER SKID	39,305	562	17,043	1,519	0	57,867
	CATEGORY (002) GAS SCRUBBER SKID	58,876	841	25,415	1,514	0	85,805
	CATEGORY (003) REACTOR SKID	126,456	942	28,472	1,730	0	156,658
	CATEGORY (004) ELECTRIC POWER, HOOKUPS, ETC (For All Skids)	6,461	255	7,560	0	0	14,021
	CATEGORY (005) INSTRUMENTATION & CONTROLS (For All Skids)	114,354	778	22,832	0	0	137,186
*	(Adjustments Are Made for Rounding Errors)						
**	(Assumed Prime Contractor Is A)						
	(Mech / Specility Contractor)						
	Subtotal	345,452	3,378	101,322	4,763	0	451,537
	WAREHOUSE/MATERIAL HANDLING (3.5%)	12,091	118	3,546	167		15,804
	MISC L&M (L: = +10%)(M: =$1.50/HR)	5,574	338	10,132			15,706
**	SUBCONTRACTOR OH & P (15+15%) Categories (004 & 005)	38,963		9,801	0		48,764
	Total Cost To Prime	402,079	3,834	124,802	4,930	0	531,811
	PRIME CONTRACTOR OH & PROFIT (10 + 10%)						111,680
	Subtotal (Construction Contract Value, Not Including) (Taxes, Bond, Escalation, & Contegency)						643,491
	GROSS RECEIPTS TAX (6.06%)						
	Subtotal						
	BOND (1.5%)						
	Subtotal						
	COST GROWTH FROM 10/92 TO 10/94 , VALUE (8.78%)						
	Subtotal						
	CONTIGENCY (25%)						
	CURRENT ESTIMATE TOTAL						

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA

ESTIMATE SUMMARY

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 6:07
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GEMWAS3.P

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
ESTIMATE SUMMARY									
TOTAL DIRECT COSTS			345,452	3,378	101,323	180	4,763	0	451,53
TOTAL JOB COST									$ 451,53

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA

ESTIMATE SUMMARY

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 6:07
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION SUMMARY									
5 METALS			25,323	177	7,128	81	816	0	$ 33,
9 FINISHES			243	108	2,241	0	0	0	$ 2,
11 EQUIPMENT			164,958	747	22,264	99	3,516	0	$ 190,
15 MECHANICAL			34,112	1,313	39,295	0	432	0	$ 73,
16 ELECTRICAL			120,815	1,033	30,398	0	0	0	$ 151,
ACCUMULATED ROUNDING ERRORS			1		(3)		(1)		
TOTAL DIRECT COSTS			345,452	3,378*	101,323	180*	4,763	0	$ 451,

Appendix E3
Estimate Subdivision Summary

RALPH M. PARSONS COMPANY

CSI - SUBDIVISION DETAIL

SHEET 1 OF

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 6:0
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 5 METALS									
51.200 Structural steel CATEGORY (001) Filter Skid			8,441	59 MH	2,376	27 HR	272		$ 11
51.200 Structural steel CATEGORY (002) Gas Scrubber			8,441	59 MH	2,376	27 HR	272		$ 11
51.200 Structural steel CATEGORY (003) Reactor Skid			8,441	59 MH	2,376	27 HR	272		$ 11
SUBTOTAL Structural steel			25,323*	177*	7,128*	81*	816*	0*	$ 33

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

SHEET 1 OF
DATE October 30, 1992 6:0
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3

ITEM DESCRIPTION			QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION HOURS	EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 9. FINISHES											
99.208 Coatings&paints	CATEGORY (001)	Filter Skid			81	36 MH	747				$
99.208 Coatings&paints	CATEGORY (002)	Gas Scrubber			81	36 MH	747				$
99.208 Coatings&paints	CATEGORY (003)	Reactor Skid			81	36 MH	747				$
SUBTOTAL Coatings&paints					243*	108*	2,241*	0*	0*	0*	$ 2

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

SHEET 3 OF 6
DATE October 30, 1992
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWA

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TO CO
CSI DIVISION 11 EQUIPMENT									
115.005 Equipment installation CATEGORY (001) Filter Skid			15,882	155 MH	4,575	31 MH	1,032	$	
115.005 Equipment installation CATEGORY (002) Gas Scrubber			42,024	177 MH	5,285	34 HR	1,242	$	
115.005 Equipment installation CATEGORY (003) Reactor Skid			107,052	415 MH	12,404	34 HR	1,242	$	1
SUBTOTAL Equipment installation			164,958*	747*	22,264*	99*	3,516*	0* $	1

H M. PARSONS COMPANY

OWNER LOS ALAMOS NATIONAL LAB.
ECT 7810 GEN WASTE TREAT. TITANIUM

SIZE NA

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 6:10 pm
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PEE

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
DIVISION 15 MECHANICAL									
59.120 PROCESS PIPE, S.S. CATEGORY (001) Filter Skid			2,026	107 MH	3,172		216		$ 5,415
59.120 PROCESS PIPE, S.S. CATEGORY (002) Gas Scrubber			2,821	414 MH	12,374				$ 15,195
59.120 PROCESS PIPE, S.S. CATEGORY (003) Reactor Skid			6,044	164 MH	4,921		216		$ 11,183
SUBTOTAL PROCESS PIPE, S.S.			10,891*	685*	20,467*	0*	432*	0*	$ 31,793*
59.300 PROCESS PIPE, SPECILITIES CATEGORY (001) Filter Skid			12,874	205 MH	6,173				$ 19,047
59.300 PROCESS PIPE, SPECILITIES CATEGORY (002) Gas Scrubber			5,509	155 MH	4,634				$ 10,142
59.300 PROCESS PIPE, SPECILITIES CATEGORY (003) Reactor Skid			4,838	268 MH	8,021				$ 12,858
SUBTOTAL PROCESS PIPE, SPECILITIES			23,221*	628*	18,828*	0*	0*	0*	$ 42,047*
TOTAL CSI DIV 15 MECHANICAL			34,112*	1,313*	39,295*	0*	432*	0*	$ 73,840*

'H M. PARSONS COMPANY

CSI - SUBDIVISION DETAIL

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 6:10 pm
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PEE

'OMER LOS ALAMOS NATIONAL LAB.
JECT 7810 GEN WASTE TREAT. TITANIUM

SIZE NA

ITEM DESCRIPTION			QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
DIVISION 16 ELECTRICAL											
68.100 Special systems	CATEGORY (005)	Instrumentation And Control			114,354	778 MH	22,838				$ 137,186
69.100 Pwr trn and dstr	CATEGORY (004)	Electrical Power, Hook Ups, Etc. F			6,461	255 MH	7,560				$ 14,020
OTAL CSI DIV 16 ELECTRICAL					120,815*	1,033*	30,398*	0*	0*	0*	$ 151,206*

Appendix E4
Estimate Detail By Category

ALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:47 pm
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PEE

USTOMER LOS ALAMOS NATIONAL LAB.
ROJECT 7810 GEN WASTE TREAT. TITANIUM

OB SIZE NA

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (001) Filter Skid									
CSI DIVISION 5 METALS									
51.200 Structural steel									
STRUCTURAL STEEL, S.S.	.6	TN	11806.20						$ 6,848
INCLUDES SHOP FABRICATION/DWG'S/ETC			6,848						
SQ STR.TUBING 4 X 4 X 1/4"S.S.	4.0	EA	304.53						$ 1,218
4 EA X 12 LF = 48 LF			1,218						
WELDING CONNECTIONS	1.0	LS	374.80	59.406	40.00	27.200	10.00		$ 3,023
Labor Is Shop Rate			375	59 MH	2,376	27 HR	272		
TOTAL 51.200 Structural steel			8,441*	59*	2,376*	27*	272*	0*	$ 11,089*
TOTAL DIV 5 METALS			8,441*	59*	2,376*	27*	272*	0*	$ 11,089*

ALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:47 pm
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PEE

JSTOMER LOS ALAMOS NATIONAL LAB.
ROJECT 7810 GEN WASTE TREAT. TITANIUM
OB SIZE
CATEGORY (001) NA

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
SI DIVISION 9 FINISHES									
99.208 Coatings&paints									
AINT, 2 PART EPOXY TYPE Included for Touch Up @ Equip. And Other Misc. Required Painting. (I.E.) Electrical.	1.0	LS	80.58 81	36.004 36 MH	20.75 747				$ 828
TOTAL 99.208 Coatings&paints			81*	36*	747*	0*	0*	0*	$ 828*
TOTAL DIV 9 FINISHES			81*	36*	747*	0*	0*	0*	$ 828*

ALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:47 pm
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PEE

USTOMER LOS ALAMOS NATIONAL LAB.
ROJECT 7810 GEN WASTE TREAT. TITANIUM

OB SIZE NA
CATEGORY (001)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
SI DIVISION 11 EQUIPMENT									
115.005 Equipment installation									
ILTER 15 GALLON 36" X 28" X41", SEALED CARTRIDGE, ONE MICRON RATING 5 GPM	1.0	EA	7777.10 7,777	28.803 29 MH	29.96 863				$ 8,640
LATE HX 13" X 30" X 37"	1.0	EA	2342.50 2,343	10.801 11 MH	29.96 324				$ 2,666
UMP P6 20" X 20" X 40" REGULAR FOR WATER AIR OPERATED DIAPHRAGM FEED PUMP, EXPLOSION PROOF, 30 GPM, 15 HP MOTOR	1.0	EA	4310.20 4,310	43.204 43 MH	29.96 1,294				$ 5,605
ILTER SKID INSTALL & HOOKUP	1.0	LS		43.204 43 MH	29.96 1,294				$ 1,294
CRANE 25 TN HYDRAULIC	1.0	LS		9.001 9 MH	22.99 207	9.001 9 MH	70.00 630		$ 837
MISC INSTALLATION MATERIALS	1.0	LS	562.20 562						$ 562
FORK LIFT	1.0	LS		19.802 20 MH	29.96 593	22.000 22 HR	18.25 402		$ 995
FREIGHT TO LANL	1.0	LS	890.15 890						$ 890
TOTAL 115.005 Equipment installation			15,882*	155*	4,575*	31*	1,032*	0*	$ 21,48
TOTAL DIV 11 EQUIPMENT			15,882*	155*	4,575*	31*	1,032*	0*	$ 21,48

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:48 pm
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (COR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PEE

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (001)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 15 MECHANICAL									
159.120 PROCESS PIPE, S.S.									
1" S.S., SCH 40S, 150#	26.0	LF	8.36 217	.450 12 MH	29.96 351				$ 568
1 1/2" S.S., SCH 40S, 150#	8.0	LF	12.54 100	.450 4 MH	29.96 108				$ 208
2" S.S., SCH 40S, 150#	4.0	LF	15.68 63	.450 2 MH	29.96 54				$ 117
SUPPORTS	1.0	LS	524.72 525	27.003 27 MH	29.96 809				$ 1,334
TEST AND CLEAN	1.0	LS	84.33 84	28.803 29 MH	29.96 863				$ 94
SCAFFOLDING	1.0	LS		9.001 9 MH	29.96 270		216.00 216		$ 48
TEFLON COATING ALLOW	48.0	LF	2.09 100	.300 14 MH	29.96 431				$ 53
2" TITANIUM, 150 #	10.0	LF	93.75 937	.954 10 MH	29.96 286				$ 1,22
TOTAL 159.120 PROCESS PIPE, S.S.			2,026*	107*	3,172*	0*	216*	0*	$ 5,41
159.300 PROCESS PIPE, SPECILITIES									
90 DEG ELBOW - 1"	8.0	EA	12.54 100	2.520 20 MH	29.96 604				$ 70
90 DEG ELBOW - 2"	1.0	EA	31.34 31	6.301 6 MH	29.96 189				$ 22
FLANGES 1"	10.0	EA	36.57 366	2.520 25 MH	29.96 755				$ 1,1
FLANGES 1 1/2"	2.0	EA	41.79 84	3.600 7 MH	29.96 216				$
FLANGES 2"	10.0	EA	52.24 522	3.600 36 MH	29.96 1,079				$ 1,
GATE VALVE 2"	2.0	EA	261.19 522	4.111 MH	29.96 15				$
CONTROL VALVE 1"	2.0	EA	3134.27 6,269	2.700 5 MH	29.96 162				$ 6,
DRAIN VALVE 3/4"	5.0	EA	104.48 522	1.800 9 MH	29.96 270				$
BOLT-UPS 1"	5.0	EA	4.69 23	.720 4 MH	29.96 108				$
BOLT-UPS 1 1/2"	1.0	EA	4.69 5	.810 1 MH	29.96 24				$

ALPH M. PARSONS COMPANY

USTOMER LOS ALAMOS NATIONAL LAB.
ROJECT 7810 GEN WASTE TREAT. TITANIUM

OB SIZE NA
CATEGORY (001)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:48 pm
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PEE

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
OLT-UPS 2"	5.0	EA	6.56 33	1.080 5 MH	29.96 162				$ 195
0 DEG ELBOW - 2" TITANIUM	2.0	EA	209.07 418	13.357 27 MH	29.96 800				$ 1,219
LANGES 2" - TITANIUM	6.0	EA	348.42 2,091	7.633 46 MH	29.96 1,372				$ 3,463
ATE VALVE 2" - TITANIUM	1.0	EA	1742.13 1,742	7.057 7 MH	29.96 211				$ 1,954
OLT-UPS 2" - TITANIUM	3.0	EA	48.78 146	2.290 7 MH	29.96 206				$ 352
TOTAL 159.300 PROCESS PIPE, SPECILITIES			12,874*	205*	6,173*	0*	0*	0*	$ 19,047*
TOTAL DIV 15 MECHANICAL			14,900*	312*	9,345*	0*	216*	0*	$ 24,462*
TOTAL CATEGORY (001)			39,304*	562*	17,043*	58*	1,520*	0*	$ 57,868*

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:4
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (002)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (002) Gas Scrubber									
CSI DIVISION 5 METALS									
51.200 Structural steel									
STRUCTURAL STEEL, S.S.	.6	TN	11806.20						
INCLUDES SHOP FABRICATION/DWG'S/ETC			6,848						$ 6,
SQ ST.TUBING 4 X 4 X 1/4" S.S.	4.0	EA	304.53						
4 EA X 12 LF = 48 LF			1,218						$ 1,
WELDING CONNECTIONS	1.0	LS	374.80	59.406	40.00	27.200	10.00		
Labor Is Shop Rate			375	59 MH	2,376	27 HR	272		$ 3,
TOTAL 51.200 Structural steel			8,441*	59*	2,376*	27*	272*	0*	$ 11
TOTAL DIV 5 METALS			8,441*	59*	2,376*	27*	272*	0*	$ 11

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:4
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (002)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 9 FINISHES									
99.208 Coatings&paints									
PAINT, 2 PART EPOXY TYPE Included For Touch Up @ Equip. And Other Misc. Required Painting. (I.E.) Electrical	1.0	LS	80.58 81	36.004 36 MH	20.75 747				$
TOTAL 99.208 Coatings&paints			81*	36*	747*	0*	0*	0*	$
TOTAL DIV 9 FINISHES			81*	36*	747*	0*	0*	0*	$

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (002)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:49
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 11 EQUIPMENT									
115.005 Equipment installation									
GAS SCRUBBER 3'X5'X7'	1.0	EA	21363.60	58.506	29.96				$ 23,1
TANK 2' DIAM X 5' HT - 55 GAL			21,364	59 MH	1,753				
100 CFM, VENTURI									
EXPLOSION PROOF									
PUMP P5 20" X 20" X 40"	1.0	EA	17053.40	32.403	29.96				$ 18,1
HASTELLOY, 15 GPM, EXPLOSION PROOF, DIAPHRAGM,			17,053	32 MH	971				
5 HP MOTOR									
BLOWER 15" X 15" X 20"	1.0	EA	2155.10	13.501	29.96				$ 2,
100 CFM, 5" W.C.S.P.			2,155	14 MH	404				
EXPLOSION PROOF									
GAS SCR SKD INSTALL & HOOKUP	1.0	LS		43.204	29.96	3.000	70.00		$ 1,
				43 MH	1,294	3 HR	210		
CRANE 25 TN HYDRAULIC	1.0	LS		9.001	29.96	9.001	70.00		$
				9 MH	270	9 MH	630		
MISC INSTALLATION MATERIALS	1.0	LS	562.20						$
			562						
FORK LIFT	1.0	LS		19.802	29.96	22.000	18.25		$
				20 MH	593	22 HR	402		
FREIGHT TO LANL	1.0	LS	890.15						$
			890						
TOTAL 115.005 Equipment installation			42,024*	177*	5,285*	34*	1,242*	0*	$ 48
TOTAL DIV 11 EQUIPMENT			42,024*	177*	5,285*	34*	1,242*	0*	$ 48

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:4
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (002)

FILE GENWAS3

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 15 MECHANICAL									
159.120 PROCESS PIPE, S.S.									
2" S.S., SCH 40S, 150#	2.0	LF	15.68	.450	29.96				$
			31	1 MH	27				
1 1/2" S.S., SCH 40S, 150#	4.0	LF	12.54	.450	29.96				$
			50	2 MH	54				
SUPPORTS	1.0	LS	524.72	27.003	29.96				$ 1,
			525	27 MH	809				
TEST AND CLEAN	1.0	LS	84.33	28.803	29.96				$
			84	29 MH	863				
SCAFFOLDING	1.0	LS		9.001	29.96				$
				9 MH	270				
TEFLON COATING ALLOW	15.0	LF	2.09	21.602	29.96				$ 9
			31	324 MH	9,708				
1 1/2" TITANIUM, 150 #	3.0	LF	75.00	.954	29.96				$
			225	3 MH	86				
4" TITANIUM, 150 #	6.0	LF	312.49	3.096	29.96				$ 2
			1,875	19 MH	557				
TOTAL 159.120 PROCESS PIPE, S.S.			2,821*	414*	12,374*	0*	0*	0*	$ 15
159.300 PROCESS PIPE, SPECIALITIES									
90 DEG ELBOWS - 1 1/2"	1.0	EA	31.34	3.600	29.96				$
			31	4 MH	108				
FLANGES 1 1/2"	2.0	EA	41.79	3.600	29.96				$
			84	7 MH	216				
FLANGES 2"	2.0	EA	52.24	3.600	29.96				$
			104	7 MH	216				
DRAIN VALVE 3/4"	3.0	EA	104.48	1.800	29.96				$
			313	5 MH	162				
BOLT-UPS 1 1/2"	1.0	EA	4.69	.810	29.96				$
			5	1 MH	24				
BOLT-UPS 2"	1.0	EA	6.56	1.080	29.96				$
			7	1 MH	32				
90' DEG ELBOW - 1 1/2" - TITAN	3.0	EA	209.05	7.633	29.96				$
			627	23 MH	686				
90 DEB ELBOW - 4" TITANIUM	2.0	EA	766.54	22.898	29.96				$
			1,533	46 MH	1,372				
FLANGES 1 1/2" - TITANIUM	4.0	EA	278.74	7.633	29.96				$
			1,115	31 MH	915				
FLANGES 4" - TITANIUM	2.0	EA	766.53	11.449	29.96				$
			1,533	23 MH	686				

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (002)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWA

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COSTS
BOLT-UPS 4" - TITANIUM	1.0	EA	93.75 94	3.816 4 MH	29.96 114				$
BOLT-UPS 1 1/2" - TITANIUM	2.0	EA	31.25 63	1.719 3 MH	29.96 103				$
TOTAL 159.300 PROCESS PIPE, SPECILITIES			5,509*	155*	4,634*	0*	0*	0*	$ 1
TOTAL DIV 15 MECHANICAL			8,330*	569*	17,008*	0*	0*	0*	$
TOTAL CATEGORY (002)			58,876*	841*	25,416*	61*	1,514*	0*	$

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:50
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.P

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (003)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (003) Reactor Skid									
CSI DIVISION 5 METALS									
51.200 Structural steel									
STRUCTURAL STEEL, S.S.	.6	TN	11806.20						
INCLUDES SHOP FABRICATION/DWG'S/ETC			6,848						$ 6,8
SQ ST TUBING 4 X 4 X 1/4" S.S.	4.0	EA	304.53						
4 EA X 12 LF = 48 LF			1,218						$ 1,2
WELDING CONNECTIONS	1.0	LS	374.80	59.406	40.00	27.200	10.00		
Labor Is Shop Rate			375	59 MH	2,376	27 MH	272		$ 3,0
TOTAL 51.200 Structural steel			8,441*	59*	2,376*	27*	272*	0*	$ 11,0
TOTAL DIV 5 METALS			8,441*	59*	2,376*	27*	272*	0*	$ 11,(

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (003)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTA COST
CSI DIVISION 9 FINISHES									
99.208 Coatings&paints									
PAINT, 2 PART EPOXY TYPE Included For Touch Up @ Equip. And Other Misc. Required Painting. (I.E) Electrical.	1.0	LS	80.58 81	36.004 36 MH	20.75 747				$
TOTAL 99.208 Coatings&paints			81*	36*	747*	0*	0*	0*	$
TOTAL DIV 9 FINISHES			81*	36*	747*	0*	0*	0*	$

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (003)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:50
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.PI

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CSI DIVISION 11 EQUIPMENT									
115.005 Equipment installation									
REACTOR 3'DIA X 6'HT HASTELLOY CLAD,6-8"DIAM HATCH, 4" RUPTURE DISC, 300 GAL CAP, CYLIN, TEFLON LINED, 15 PSI DES OVERPRESS, STRESS RELIEV, JACKETED, DISH SHAPED T & B, FIRE & EXPLOS PROOF	1.0	EA	42727.20 42,727	72.007 72 MH	29.96 2,157				$ 44,88
PUMP P1 15" X 25" X 30" HASTELLOY, 1 GPM, EXPLOSION PROOF, DIAPHRAGM, 1 HP MOTOR	1.0	EA	5340.90 5,341	28.803 29 MH	29.96 863				$ 6,20
PUMP P2 15" X 25" X 30" HASTELLOY, 1 GPM, EXPLOSION PROOF, DIAPHRAGM, 1 HP MOTOR	1.0	EA	5340.90 5,341	28.803 29 MH	29.96 863				$ 6,2
PUMP P3 20" X 20" X 40" HASTELLOY, 20 GPM, EXPLOSION PROOF, DIAPHRAGM, 10 HP MOTOR	1.0	EA	17053.40 17,053	75.608 76 MH	29.96 2,265				$ 19,3
PUMP P4 20" X 20" X 40" HASTELLOY, 30 GPM, EXPLOSION PROOF, DIAPHRAGM, 15 HP MOTOR	2.0	EA	17053.40 34,107	54.005 108 MH	29.96 3,236				$ 37,3
AGITATOR 10" X 10" X 15" EXPLOSION PROOF MOTOR	1.0	EA	1030.70 1,031	28.803 29 MH	29.96 863				$ 1,8
REACTOR SKID INSTALL & HOOKUP	1.0	LS		43.204 43 MH	29.96 1,294	3.000 3 HR	70.00 210		$ 1,5
CRANE 25 TN HYDRAULIC	1.0	LS		9.001 9 MH	29.96 270	9.001 9 MH	70.00 630		$ 5
MISC INSTALLATION MATERIALS	1.0	LS	562.20 562						$ 5
FORK LIFT	1.0	LS		19.802 20 MH	29.96 593	22.000 22 HR	18.25 402		$ 1
FREIGHT TO LANL	1.0	LS	890.15 890						$ 1
TOTAL 115.005 Equipment installation			107,052*	415*	12,404*	34*	1,242*	0*	$ 120,
TOTAL DIV 11 EQUIPMENT			107,052*	415*	12,404*	34*	1,242*	0*	$ 120,

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (003)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTA COST
CSI DIVISION 15 MECHANICAL									
159.120 PROCESS PIPE, S.S.									
1" S.S., SCH 40S, 150#	20.0	LF	8.36	.450	29.96				
			167	9 MH	270				$
1 1/2" S.S., SCH 40S, 150#	12.0	LF	12.54	.450	29.96				
			150	5 MH	162				$
2" S.S., SCH 40S, 150#	17.0	LF	15.68	.450	29.96				
			266	8 MH	229				$
SUPPORTS	1.0	LS	524.72	27.003	29.96				
			525	27 MH	809				$ 1.
TEST AND CLEAN	1.0	LS	84.33	28.803	29.96				
			84	29 MH	863				$
SCAFFOLDING	1.0	LS		9.001	29.96		216.00		
				9 MH	270		216		$
TEFLON COATING ALLOW	115.0	LF	2.09	.125	29.96				
			240	14 MH	431				$
1" TITANIUM, 150 #	36.0	LF	50.00	.954	29.96				
			1,800	34 MH	1,029				$
2" TITANIUM, 150 #	30.0	LF	93.75	.954	29.96				
			2,812	29 MH	858				$
TOTAL 159.120 PROCESS PIPE, S.S.			6,044*	164*	4,921*	0*	216*	0*	$ 1
159.300 PROCESS PIPE, SPECILITIES									
90 DEG ELBOW - 1"	3.0	EA	12.54	2.520	29.96				
			38	8 MH	227				$
90 DEG ELBOW - 1 1/2"	2.0	EA	31.35	4.545	29.96				
			63	9 MH	272				$
90 DEG ELBOW - 2"	6.0	EA	31.34	6.301	29.96				
			188	38 MH	1,133				$
45 DEG ELBOW - 1"	1.0	EA	12.54	2.520	29.96				
			13	3 MH	76				$
FLANGES 1"	6.0	EA	36.57	2.520	29.96				
			219	15 MH	453				$
FLANGES 1 1/2"	4.0	EA	41.79	3.600	29.96				
			167	14 MH	431				$
FLANGES 2"	8.0	EA	52.24	3.600	29.96				
			418	29 MH	863				$
DRAIN 3/4"	6.0	EA	93.70	1.800	29.96				
			562	11 MH	324				$
TRAP 3/4"	1.0	EA	88.83	3.150	29.96				
			89	3 MH	94				$

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (003)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:51
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
BOLT-UPS 1"	3.0	EA	4.69 14	.720 2 MH	29.96 65				$
BOLT-UPS 1 1/2"	2.0	EA	4.69 9	.810 2 MH	29.96 49				$
BOLT-UPS 2"	4.0	EA	6.56 26	1.080 4 MH	29.96 129				$ 1
90 DEG ELBOW - 1" TITANIUM	4.0	EA	75.00 300	5.401 22 MH	29.96 647				$ 9
90 DEG ELBOW - 2" TITANIUM	5.0	EA	209.06 1,045	13.357 67 MH	29.96 2,001				$ 3,0
FLANGES 1" - TITANIUM	4.0	EA	237.48 950	5.343 21 MH	29.96 640				$ 1,'
FLANGES 2" - TITANIUM	2.0	EA	312.49 625	7.633 15 MH	29.96 457				$ 1,0
BOLT-UPS 1" - TITANIUM	2.0	EA	31.25 63	1.530 3 MH	29.96 92				$
BOLT-UPS 2" - TITANIUM	1.0	EA	48.78 49	2.286 2 MH	29.96 68				$
TOTAL 159.300 PROCESS PIPE, SPECILITIES			4,838*	268*	8,021*	0*	0*	0*	$ 12,
TOTAL DIV 15 MECHANICAL			10,882*	432*	12,942*	0*	216*	0*	$ 24,
TOTAL CATEGORY (003)			126,456*	942*	28,469*	61*	1,730*	0*	$ 156,

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (004)

FILE GENWAS

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (004) Electrical Power, Hook Ups, Etc. For All Three Skids Note: Skids For This Exercise Are Hooked In Tandem.									
CSI DIVISION 16 E L E C T R I C A L									
169.100 Pwr trn and dstr									
3/4" RGS PVC COATED AG	60.0	LF	1.63 98	.135 8	MH	29.55 239			$
1 1/4" RGS PVC COATED AG	500.0	LF	2.67 1,335	.150 75	MH	29.55 2,217			$
1 1/4" COND.SUPPORT & FITTINGS	500.0	LF	1.87 937	.113 56	MH	29.55 1,662			$
3/4" GUAC STEEL W/ C&G	6.0	EA	18.23 109	.720 4	MH	29.55 128			$
3/4" SEALTITE FLEX	20.0	LF	1.10 22	.124 2	MH	29.55 74			$
3/4" S/T FLEX CONN STR	16.0	EA	2.27 36	.158 3	MH	29.55 75			$
MISC STRAPS & FITTINGS 3/4"C.	1.0	LS	23.43 23	5.401 5	MH	29.55 160			$
PANEL BOARD 100A / 480V THREE PHASE PANEL BOARD WITH 12-20 AMP CIRCUIT BREAKERS, NEMA 7 INCLUDING NECESSARY RELAYS	1.0	EA	2342.50 2,343	43.204 43	MH	29.55 1,277			$
1/C #10 AWG 600V XHHW STR	220.0	LF	.17 37	.013 3	MH	29.55 86			$
1/C #2 AWG 600V XHHW	2,100.0	LF	.61 1,279	.026 56	MH	29.55 1,642			$
WASTE ALLOW 160.00	1.0	LS	241.75 242						$
T O T A L 169.100 Pwr trn and dstr			6,461*	255*		7,560*	0*	0*	0* $
T O T A L D I V 16 E L E C T R I C A L			6,461*	255*		7,560*	0*	0*	0* $
T O T A L CATEGORY (004)			6,461*	255*		7,560*	0*	0*	0* $

RALPH M. PARSONS COMPANY

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:51
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA

CATEGORY (005)

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
CATEGORY (005) Instrumentation And Control Note: Exposed Material To Be PVC Coated									
CSI DIVISION 16 ELECTRICAL									
168.100 Special systems									
REACTOR H2 ANALYZER SENSOR AE-001 - ANALYZING ELEMENT - MSA H2 MODEL #487811 PART OF AT - 001	1.0	EA		1.800 2 MH	29.55 53			$	
BUILDING VENT STACK GAS ANAL SENSOR (H2, CL, H2S) AE - 003 - ANALYZING ELEMENT - MSA 5000 SERIES SYSTEM PART OF AT - 003	1.0	EA		1.800 2 MH	29.55 53			$	
REACTOR H2 ANALYZER TRANSMIT. AT - 001 - ANALYZER TRANSMITTER - MSA H2 MODEL # 487811 INCLUDES AE - 001	1.0	EA	562.20 562	7.201 7 MH	29.55 213			$	
REACTOR RECYCLE SOLUTION P/H ANALYZER TRANSMITTER AT - 002 - ANALYZER TRANSMITTER - FOXBORO 870 TRANSMITTER AND 871 SENSOR WITH ACCESSORIES - FOXBORO (IA) SERIES	1.0	EA	1405.50 1,406	9.001 9 MH	29.55 266			$	1
BUILDING VENT STACK GAS ANAL AT - 003 - ANALYZER TRANSMITTER - MSA SERIES 5000 SYSTEM MONITOR FOR H2, H2S, & CL2, WITH ALARM CAPABILITIES	1.0	EA	4685.00 4,685	36.004 36 MH	29.55 1,064			$	5
REACTOR H2 CONTROL (DILUTION AREA) - AV - 001 - ANALYZER CONTROL VALVE - FISHER - 4" BUTTERFLY SS DISC. INCLUDES ACTUATOR AND ELECTRO-PNEUMATIC POSITIONER	1.0	EA	2436.20 2,436	13.501 14 MH	29.55 399			$	2
INTRINSIC BARRIER (X-PURGE) CP # 1 - ENCLOSURE - HOFFMAN	1.0	EA		3.600 4 MH	29.55 106			$	
FIELD BUS MODULE CP # 2 - ENCLOSURE - FOXBORO FE - 8 - ENCLOSURE WITH (FBM - 01, 04, 17D) - MODULES - FBM-01 2 EA $2.6K - FBM-04 1 EA $1.3K, FBM-17 1 EA $1.3K, FE-8 1 EA $7.5K	1.0	EA	11899.90 11,900	9.001 9 MH	29.55 266			$	1
PROCESS CONTROL COMPUTER CP # 3 - PROCESS COMPUTER - FOXBORO SUPPLIED COMPUTER PLUS FOXBORO (IAS) INTEGRATED CONTROL SOFTWARE	1.0	EA	44039.00 44,039	22.502 23 MH	29.55 665			$	4
HEPA FILTER D/P TRANSMITTER DPT - 001 - DIFFERENTIAL PRESSURE TRANSMITTER - FOXBORO 823 D/P - FOXBORO (IA) SERIES	1.0	EA	1124.40 1,124	13.501 14 MH	29.55 399			$	
FILTER D/P TRANSMITTER DPT - 002 - DIFFERENTIAL PRESSURE TRANSMITTER - FOXBORO 823 D/P - FOXBORO (IA) SERIES	1.0	EA	1124.40 1,124	13.501 14 MH	29.55 399			$	
REAGENT FLOW SENSOR FE - 001 - FLOW ELEMENT - MICRO MOTION CMF - 025 NOT AVAILABLE IN HASTELOY YET	1.0	EA	3279.50 3,280	4.500 5 MH	29.55 133			$	

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (005)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

SHEET 18 O
DATE October 30, 1992
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	FILE GENL IC CC
P/H SOLUTION FLOW SENSOR FE - 002 - FLOW ELEMENT - MICRO MOTION CMF - 025 NOT AVAILABLE IN HASTELOY YET	1.0	EA	3279.50 3,280	4.500 5 MH	29.55 133				$
SCRUBBER SOLUTION FLOW ORIFICE FE - 003 - FLOW ELEMENT - FOXBORO IFOA - HASTELOY	1.0	EA	2998.40 2,998	4.500 5 MH	29.55 133				$
REAGENTS TO REACTOR FLOW TRNMT FT - 001 - FLOW TRANSMITTER - MICRO MOTION RFT - 9739	1.0	EA	2811.00 2,811	7.201 7 MH	29.55 213				$
P/H SOLUTION TO REACT FLW TRM FT - 002 - FLOW TRANSMITTER - MICRO MOTION RFT - 9739	1.0	EA	2811.00 2,811	7.201 7 MH	29.55 213				$
SCRUBBER SOLUTION FLOW TRANSMT FT - 003 - FLOW TRANSMITTER - FOXBORO 823 DP FOXBORO (IA) SERIES	1.0	EA	1124.40 1,124	13.501 14 MH	29.55 399				$
REACTOR COOLANT/HEATING HDSWIT HS - 001 - HAND SWITCH - ALLEN BRADLEY	1.0	EA	140.55 141	1.800 2 MH	29.55 53				$
EXP TANK LEVEL GAUGE GLASS LG - 002 - LEVEL GAUGE GLASS - PENBERTHY MODEL 21L - 7 24" SS WETTED PARTS	1.0	EA	937.00 937	8.101 8 MH	29.55 239				$
SCRUBBER LIQUID LEVEL GAUG GLS LG - 003 LEVEL GAUGE GLASS - PENBERTHY MODEL 3TL - 7 48" SS WETTED PARTS	1.0	EA	1405.50 1,406	11.701 12 MH	29.55 346				$
REACTOR LEVEL TRANSMITTER LT - 001 - LEVEL TRANSMITTER - FOXBORO 823 D/P FOXBORO (IA) SERIES - HASTELOY	1.0	EA	1124.40 1,124	13.501 14 MH	29.55 399				$
REACTOR PRESSURE CONTROL PCV - 001 - PRESSURE CONTROL VALVE - FISHER 4" BUTTERFLY SS DISC - INCLUDES ACTUATOR AND ELECTRO - PNEAUMATIC POSITIONER	1.0	EA	2436.20 2,436	13.501 14 MH	29.55 399				$
REACTOR PRESSURE INDICATOR PG - 001 - PRESSURE INDICATOR - ASHCROFT MODEL 1009 3.5 " GAUGE - WITH PROCESS DIAPHGRAM SEAL	1.0	EA	702.75 703	2.070 2 MH	29.55 61				$
EXPANSION TANK PRESSURE INDIC PG - 002 - PRESSURE GAUGE - ASHCROFT MODEL 1009 3.5" GAUGE - WITH PROCESS DIAPHGRAM SEAL	1.0	EA	702.75 703	1.800 2 MH	29.55 53				$
SCRUBBER PRESSURE INDICATOR PG - 0003 - ASHCROFT MODEL 1009 3.5" GAUGE - WITH PROCESS DIAPHRAGM SEAL	1.0	EA	702.75 703	1.800 2 MH	29.55 53				$
SCRUBBER SOLUTION PRESS INDIC PG - 005 - PRESSURE GAUGE - ASHCROFT MODEL 1009 3.5" GAUGE - WITH PROCESS DIAPHGRAM SEAL	1.0	EA	702.75 703	1.800 2 MH	29.55 53				$
REACTOR COOL PUMP DISCH PR IND PG - 006 - PRESSURE GAUGE - ASHCROFT MODEL 1009 3.5" GAUGE - WITH PROCESS DIAPHGRAM SEAL	1.0	EA	702.75 703	1.800 2 MH	29.55 53				$
REACTOR PRESSURE TRANSMITTER PT - 001 - PRESSURE TRANSMITTER - FOXBORO 821 FOXBORO (IA) SERIES	1.0	EA	1124.40 1,124	7.201 7 MH	29.55 213				$
STEAM TO REAC PRESS TRANSMIT PT - 002 - PRESSURE TRANSMITTER - FOXBORO 821 FOXBORO (IA) SERIES	1.0	EA	1124.40 1,124	7.201 7 MH	29.55 213				$

RALPH M. PARSONS COMPANY

CUSTOMER LOS ALAMOS NATIONAL LAB.
PROJECT 7810 GEN WASTE TREAT. TITANIUM

JOB SIZE NA
CATEGORY (005)

DETAIL COST ESTIMATE BY LOCATION

GENERIC WASTE TREATMENT SKID
ESTIMATE FIGURED WITH
TITANIUM PIPING AND EQUIPMENT

DATE October 30, 1992 5:52
MTO BY ESTIMATING/ENG.
EST BY DAVID CHAMPION
ESTIMATE TYPE (CDR)
DESIGN STATUS CONCEPTUAL DESIGN
FILE GENWAS3.

ITEM DESCRIPTION	QUANTITY NUMBER	QUANTITY UNIT	MATERIAL COSTS	LABOR MANHOURS	LABOR COSTS	CONSTRUCTION EQUIPMENT HOURS	CONSTRUCTION EQUIPMENT COSTS	OTHER COSTS	TOTAL COST
SCRUBBER PRESSURE TRANSMITTER	1.0	EA	1124.40	7.201	29.55				$ 1,3
PT - 003 - PRESSURE TRANSMITTER - FOXBORO 821			1,124	7 MH	213				
REACTOR COOLING SUPPLY (WATER)	1.0	EA	3279.50	7.201	29.55				$ 3,4
TCV - 001 - TEMPERATURE CONTROL VALVE - FISHER			3,280	7 MH	213				
2" CAGE GUIDED GLOBE VALVE									
REACTOR HEAT SUPPLY (STEAM)	1.0	EA	3279.50	7.201	29.55				$ 3,4
TCV - 002 - TEMPERATURE CONTROL VALVE - FISHER			3,280	7 MH	213				
2" CAGE GUIDED GLOBE VALVE									
REACTOR TEMP TRANSMITTER	1.0	EA	702.75	7.201	29.55				$
TT - 001 - TEMPERATURE TRANSMITTER - FOXBORO 893			703	7 MH	213				
INCLUDES TE - 001 - FOXBORO (IA) SERIES									
HEAT EXCH TUBE SIDE TEMP TRANS	1.0	EA	702.75	7.201	29.55				$
TT - 002 - TEMPERATURE TRANSMITTER - FOXBORO 893			703	7 MH	213				
INCLUDES TE - 002 - FOXBORO (IA) SERIES									
HEAT EXCH SHELL SIDE TEMP TRAN	1.0	EA	702.75	7.201	29.55				$
TT - 003 - TEMPERATURE TRANSMITTER - FOXBORO 893			703	7 MH	213				
INCLUDES TE - 003 - FOXBORO (IA) SERIES									
BULK MATERIALS - FOR VALVES	1.0	EA	9174.17	484.518	29.55				$ 23,
AND INSTRUMENTS - PIPING & TUBING (AIR SUPPLY & PROCESS)			9,174	485 MH	14,318				
INSTRUMENT SUPPORTS - PIPING & TUBING SUPPORT SYSTEM									
ANALYZERS:SPECIAL EQUIPMENT ALLOW CALIBRATION & LOOP TEST									
TOTAL 168.100 Special systems			114,354*	778*	22,838*	0*	0*	0*	$ 137,
TOTAL DIV 16 ELECTRICAL			114,354*	778*	22,838*	0*	0*	0*	$ 137,
TOTAL CATEGORY (005)			114,354*	778*	22,838*	0*	0*	0*	$ 137,

BULK MATERIAL SUMMARY

PROJECT
OPTION

PAGE 4400 - 1
BY
DATE October 29, 1992
TIME 1:43 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION												
4413 ANALYZER SYSTEMS		EA	.00	.00	.00	.00	6,500	0	0	150	750	7,25
4425 SUB HDR PIPE-MULT-SUPPORT	5	LS	.00	.00	.00	.00	1,570	0	0	48	1,401	2,97
4427 INSTRUMENT INSTALLATION MATERIAL	335	LF	4.96	.66	19.56	.00	1,662	0	0	222	6,554	8,21
4499 CALIBRATION AND TESTING	6	LS	.00	6.26	185.05	.00	0	0	0	119	3,516	3,51
CONSTRUCTION WASTE							59					5
ACCOUNT 4400 SUBTOTAL:		EA	.00	.00	.00	.00 $	9,791	0 $	0	538 $	12,221 $	22,01
LABOR PRODUCTIVITY ADJ 538 / 60 % =	897	MH			22.70					359	8,147	8,14
4400 INSTRUMENTATION		EA					$ 9,791	0 $	0	897 $	20,368 $	30,1

BULK MATERIAL DETAIL

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOT DOLL
4400 INSTRUMENTATION													
4413 ANALYZER SYSTEMS													
ANALYZERS													
Special Allowance for Misc ----Small Valves,Brackets,Hardware,Extra Tubing,& Special Equipment etc.	1.0	1	ls	6500.00	150.00	750.00	.00	6,500	.0	0	150.0	750	7,
ANALYZERS			ea	.00	.00	.00	.00	6,500	.0	0	150.0	750	7,
		2.20	Tons		Wage Rate:	5.00							
4413 ANALYZER SYSTEMS			EA	.00	.00	.00	.00	6,500	.0	0	150.0	750	7,
		2.2	Tons		Wage Rate:	5.00							

BULK MATERIAL DETAIL

PROJECT

OPTION

BY
DATE October 29, 1992
TIME 1:41 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLAR
4400 INSTRUMENTATION													
4425 SUB HDR PIPE-MULT-SUPPORT													
INSTRUMENTS SUPPORTS													
D/P Transmitters/Indicators	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	40
Pressure/Temperature Xmitters	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	40
Flow/Pressure/Temp Controllers	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	40
Local Electronic Indicators	3.0	3	ea	75.00	2.00	59.00	.00	225	.0	0	6.0	177	40
INSTRUMENTS SUPPORTS		12	ea	75.00	2.00	59.00	.00	900	.0	0	24.0	708	1,60
				Wage Rate:		29.50							
TUBING SUPPORTS													
Piping & Tubing Support System	335.0	335	lf	2.00	.07	2.07	.00	670	.0	0	23.5	693	1,3
TUBING SUPPORTS		335	ea	2.00	.07	2.07	.00	670	.0	0	23.5	693	1,3
		737	Tons		Wage Rate:	29.49							
4425 SUB HDR PIPE-MULT-SUPPORT		1	LS	.00	.00	.00	.00	1,570	.0	0	47.5	1,401	2,9
		737.0	Tons		Wage Rate:	29.49							

BULK MATERIAL DETAIL

PROJECT

OPTION

BY
DATE October 29, 1992
TIME 1:41 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TO DOL
4400 INSTRUMENTATION													
4427 INSTRUMENT INSTALLATION MATERIAL													
PIPE CS GALV													
1/2 inch Pipe Wld A120 Std Glv	100.0	100	lf	.60	.25	7.39	.00	60	.0	0	25.0	739	
PIPE CS GALV		100	lf	.60	.25	7.39	.00	60	.0	0	25.0	739	
				Wage Rate:		29.56							
TUBING A269 304													
1/2 inch Tubing 304ss A269 049	175.0	175	lf	2.25	.25	7.39	.00	394	.0	0	43.8	1,293	
1/2 inch Tubing 304ss A269 049	20.0	20	lf	2.25	.25	7.40	.00	45	.0	0	5.0	148	
TUBING A269 304		195	lf	2.25	.25	7.39	.00	439	.0	0	48.8	1,441	
				Wage Rate:		29.53							
TUBING A260 316													
1/4 inch Tubing 316ss A260 030	40.0	40	lf	2.32	.25	7.40	.00	93	.0	0	10.0	296	
TUBING A260 316		40	lf	2.33	.25	7.40	.00	93	.0	0	10.0	296	
				Wage Rate:		29.60							
CS 3-WAY VALVE MANIFOLD													
1/4 inch 3Way Manifold Vlve CS	2.0	2	ea	95.55	1.50	44.50	.00	191	.0	0	3.0	89	
CS 3-WAY VALVE MANIFOLD		2	ea	95.50	1.50	44.50	.00	191	.0	0	3.0	89	
				Wage Rate:		29.67							
GATE VALVE CS													
1/2 inch Gate Valve CS	4.0	4	ea	28.35	.80	23.75	.00	113	.0	0	3.2	95	
1/2 inch Gate Valve CS	7.0	7	ea	28.35	.80	23.57	.00	198	.0	0	5.6	165	
GATE VALVE CS		11	ea	28.27	.80	23.64	.00	311	.0	0	8.8	260	
				Wage Rate:		29.55							
NEEDLE VALVE BRS													
1/4 inch Needle Valve Brass	4.0	4	ea	12.08	.80	23.75	.00	48	.0	0	3.2	95	
NEEDLE VALVE BRS		4	ea	12.00	.80	23.75	.00	48	.0	0	3.2	95	
				Wage Rate:		29.69							

BULK MATERIAL DETAIL

PROJECT

OPTION

BY
DATE October 29, 1992
TIME 1:42 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION													
4427 INSTRUMENT INSTALLATION MATERIAL													
NIPPLE CS A106													
1/2 inch x 3 inch Nipple CS XS	7.0	7	ea	1.37	1.00	29.57	.00	10	.0	0	7.0	207	217
1/2 inch x 3 inch Nipple CS XS	2.0	2	ea	1.37	1.00	29.50	.00	3	.0	0	2.0	59	62
1/2 inch x 6 inch Nipple CS XS	2.0	2	ea	2.15	1.00	29.50	.00	4	.0	0	2.0	59	63
NIPPLE CS A106		11	ea	1.55	1.00	29.55	.00	17	.0	0	11.0	325	342
				Wage Rate:		29.55							
NIPPLE CS GALV													
1/4 inch x 3 inch NippleCS Std	8.0	8	ea	.68	1.00	29.50	.00	5	.0	0	8.0	236	241
NIPPLE CS GALV		8	ea	.63	1.00	29.50	.00	5	.0	0	8.0	236	241
				Wage Rate:		29.50							
SWAGE NIPPLE CS A181													
3/4 x 1/2 Swage Nipple CS A181	4.0	4	ea	3.43	1.00	29.50	.00	14	.0	0	4.0	118	132
3/4 x 1/2 Swage Nipple CS A181	7.0	7	ea	3.43	1.00	29.57	.00	24	.0	0	7.0	207	231
SWAGE NIPPLE CS A181		11	ea	3.45	1.00	29.55	.00	38	.0	0	11.0	325	36[illegible]
				Wage Rate:		29.55							
90 ELL GALV CS													
1/2 inch 90 Ell CS A197 Scrd	8.0	8	ea	2.39	.50	14.75	.00	19	.0	0	4.0	118	13[illegible]
90 ELL GALV CS		8	ea	2.38	.50	14.75	.00	19	.0	0	4.0	118	13[illegible]
				Wage Rate:		29.50							
TEE CS A105													
1/2 inch Tee CS A105 Scrd	4.0	4	ea	3.65	.50	14.75	.00	15	.0	0	2.0	59	7[illegible]
1/2 inch Tee CS A105 Scrd	14.0	14	ea	3.65	.50	14.79	.00	51	.0	0	7.0	207	25[illegible]
1/2 inch Tee CS A105 Scrd	4.0	4	ea	3.65	.50	14.75	.00	15	.0	0	2.0	59	7[illegible]
TEE CS A105		22	ea	3.68	.50	14.77	.00	81	.0	0	11.0	325	40[illegible]
				Wage Rate:		29.55							

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT M/HRS	SUBCONTRACT DOLLARS	DIRECT LABOR M/HRS	DIRECT LABOR DOLLARS	TOTAL DOLLARS
4400 INSTRUMENTATION													
4427 INSTRUMENT INSTALLATION MATERIAL													
TEE GALV CS													
1/2 inch Tee CS A197 Scrd	4.0	4	ea	3.13	.50	14.75	.00	13	.0	0	2.0	59	7.
TEE GALV CS		4	ea	3.25	.50	14.75	.00	13	.0	0	2.0	59	7.
				Wage Rate:		29.50							
REDUCING TEE GALV CS													
1/2 x 1/4 Tee CS A197 Scrd	4.0	4	ea	3.59	.50	14.75	.00	14	.0	0	2.0	59	7
REDUCING TEE GALV CS		4	ea	3.50	.50	14.75	.00	14	.0	0	2.0	59	7
				Wage Rate:		29.50							
PLUG RND SLD STL													
1/2 inch Plug Round Solid Stl	4.0	4	ea	.58	1.00	29.50	.00	2	.0	0	4.0	118	12
1/2 inch Plug Round Solid Stl	14.0	14	ea	.58	1.00	29.57	.00	8	.0	0	14.0	414	42
1/2 inch Plug Round Solid Stl	4.0	4	ea	.58	1.00	29.50	.00	2	.0	0	4.0	118	12
PLUG RND SLD STL		22	ea	.55	1.00	29.55	.00	12	.0	0	22.0	650	66
				Wage Rate:		29.55							
PLUG GALV													
1/4 inch Plug A197 Galv	4.0	4	ea	.59	1.00	29.50	.00	2	.0	0	4.0	118	12
PLUG GALV		4	ea	.50	1.00	29.50	.00	2	.0	0	4.0	118	12
				Wage Rate:		29.50							
CONN MALE CS													
1/2 x 1/2 Male Connector CS	4.0	4	ea	3.37	1.00	29.50	.00	13	.0	0	4.0	118	1
CONN MALE CS		4	ea	3.25	1.00	29.50	.00	13	.0	0	4.0	118	1
				Wage Rate:		29.50							
CONN MALE 316													
1/4 x 1/4 Male Connector SS	16.0	16	ea	7.06	1.00	29.56	.00	113	.0	0	16.0	473	5
1/4 x 1/2 Male Connector SS	7.0	7	ea	8.10	1.00	29.57	.00	57	.0	0	7.0	207	2
1/2 x 1/2 Male Connector SS	21.0	21	ea	6.46	1.00	29.57	.00	136	.0	0	21.0	621	7
CONN MALE 316		44	ea	6.95	1.00	29.57	.00	306	.0	0	44.0	1,301	1,6
				Wage Rate:		29.57							
4427 INSTRUMENT INSTALLATION MATERIAL		335	LF	4.96	.66	19.56	.00	1,662	.0	0	221.8	6,554	8,2
CONSTRUCTION WASTE		34	LF	1.74				59					
				Wage Rate:		29.55							

PROJECT

OPTION

BULK MATERIAL DETAIL

BY
DATE October 29, 1992
TIME 1:42 pm
FILE 100WASH.PEE

ITEM DESCRIPTION	TAKEOFF QUANTITY	ESTIMATE QUANTITY	UNIT	COST OR M/HR PER UNIT: MATL $	M/HRS	LABOR $	SUBCON $	MATERIAL EXPENSE	SUBCONTRACT: M/HRS	DOLLARS	DIRECT LABOR: M/HRS	DOLLARS	TOTA DOLLA
4400 INSTRUMENTATION													
4499 CALIBRATION AND TESTING													
Calibrate Field Mounted Instruments													
Control Valves	4.0	4	ea	.00	1.00	29.50	.00	0	.0	0	4.0	118	1
Flow Instruments	3.0	3	ea	.00	5.00	147.67	.00	0	.0	0	15.0	443	4
Pressure Instruments	6.0	6	ea	.00	4.00	118.17	.00	0	.0	0	24.0	709	7
Temperature Instruments	3.0	3	ea	.00	4.00	118.33	.00	0	.0	0	12.0	355	3
Analyzers	3.0	3	ea	.00	16.00	472.67	.00	0	.0	0	48.0	1,418	1,4
Calibrate Field Mounted Instruments		19	ea	.00	5.42	160.16	.00	0	.0	0	103.0	3,043	3,0
		42.74	Tons		Wage Rate:	29.54							
Loop Check													
Loop Check.	1.0	1	ls	.00	16.00	473.00	.00	0	.0	0	16.0	473	4
Loop Check			ea	.00	.00	.00	.00	0	.0	0	16.0	473	4
					Wage Rate:	29.56							
4499 CALIBRATION AND TESTING		1	LS	.00	6.26	185.05	.00	0	.0	0	119.0	3,516	3,5
		42.74	Tons		Wage Rate:	29.55							
SUBTOTAL: CONSTRUCTION WASTE			EA	.00	.00	.00	.00	9,732 59	.0	0	538.3	12,221	21,9
4400 INSTRUMENTATION		.0	EA	.00	.00	.00	.00	$ 9,791	.0 $	0	538.3	$ 12,221	$ 22,0
		781.94	Tons		Wage Rate:	22.70							