

SECTION 6
PROCESS FLOW DIAGRAMS

The flow diagrams for the units described in Section 5 are shown on the drawings contained in this section. A list of these drawings appears on page 5-1 in Section 5.

These drawings show the process flow, material balances, and characteristics of the major process equipment. Also shown are the control instruments critical for the process.

The flow diagrams for proprietary processes are shown in a simplified form and contain only the material balances in and out of the units.

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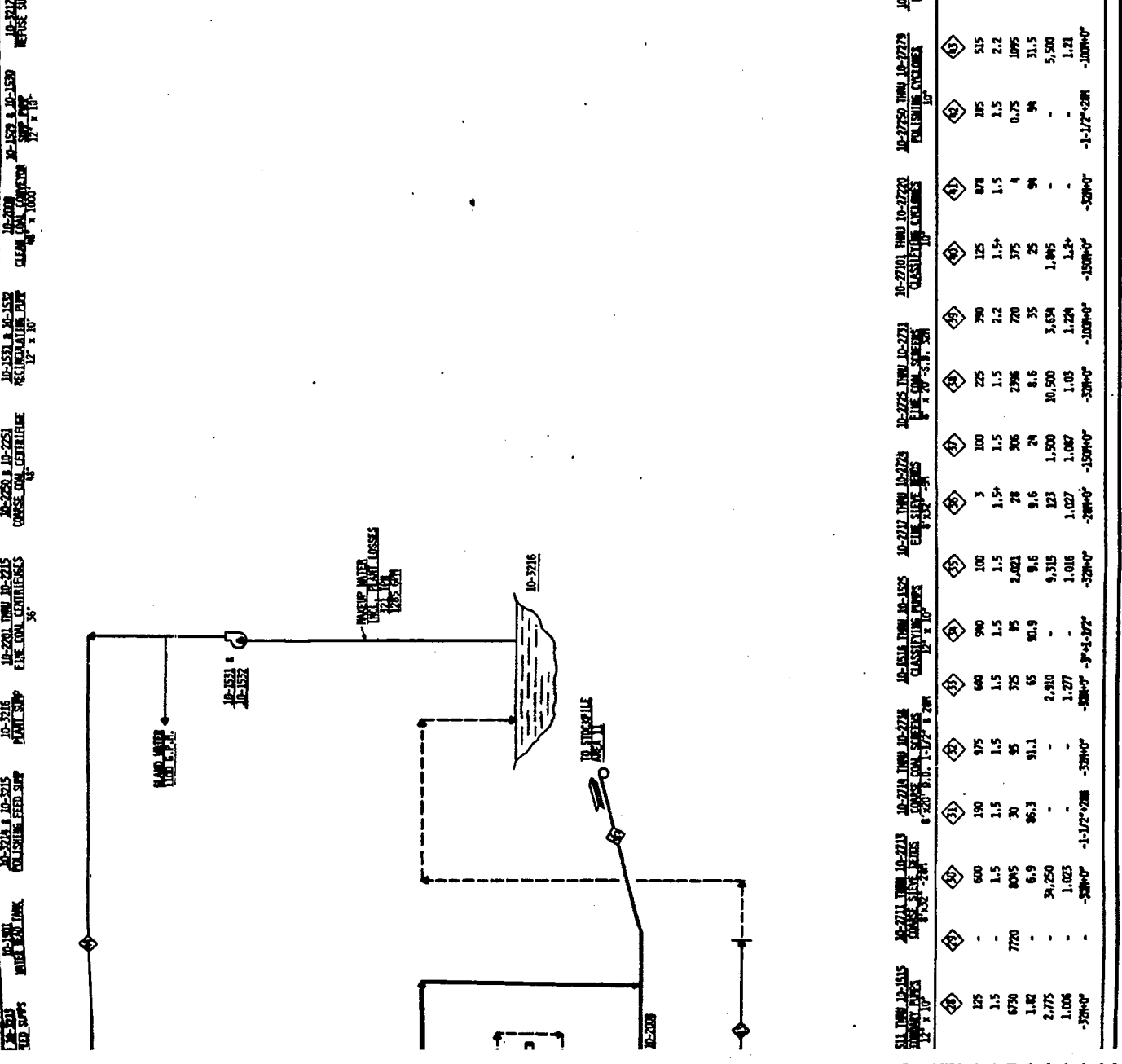
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ID	NAME	CLASSIFICATION	ISSUED FOR REFERENCE				DATE
			BY	NO.	DATE	REVISION	
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ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (ERDA-FE)
OIL/GAS UNIT
PROCESS FLOW DIAGRAM
COAL PREPARATION-UNIT 10

THE FOLLOWING INFORMATION IS FOR INFORMATION ONLY
5935-2
R-10-75-1



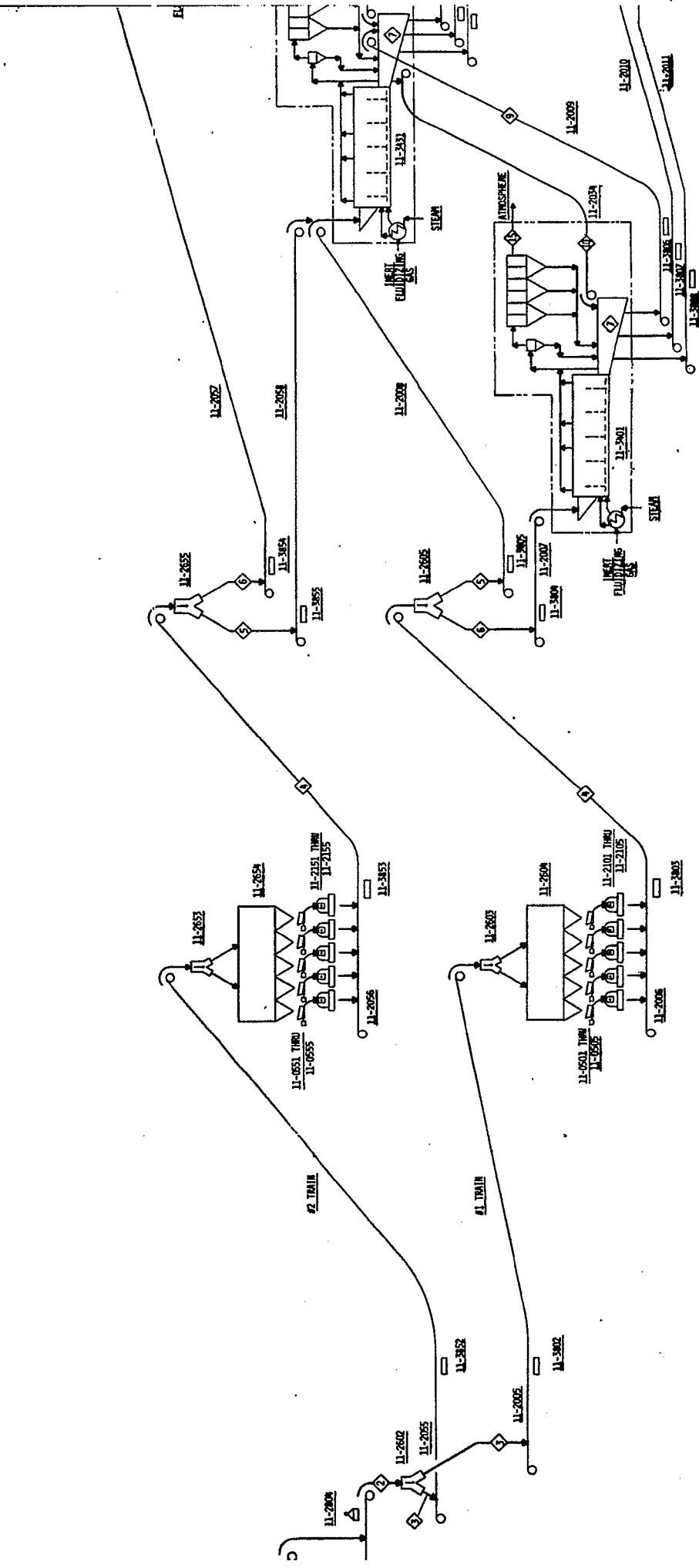
NOTE: FLOW LINES SHOW DESIGN CAPACITIES, NOT NORMAL FLOWS.

ID	NAME	CLASSIFICATION	10-2214 THRU 10-2215 COARSE COM. SCREENS	10-2217 THRU 10-2223 FINE COM. SCREENS	10-2775 THRU 10-2781 PULVERIZING CYCLONES	10-2778 THRU 10-2780 CLASSIFYING CYCLONES	10-2779 THRU 10-2781 PULVERIZING CYCLONES	10-2775 THRU 10-2781 PULVERIZING CYCLONES	10-2775 THRU 10-2781 PULVERIZING CYCLONES
10-1491	WATER PUMP	10-2216							
10-1522	HAND WATER PUMP	10-2216							
10-2214	COARSE COM. SCREENS	10-2214	3	100	3	100	225	390	478
10-2215	FINE COM. SCREENS	10-2215	90	100	100	100	225	390	478
10-2216	STORAGE TANK	10-2216	90	100	100	100	225	390	478
10-2217	CLASSIFYING CYCLONE	10-2217	640	100	100	100	225	390	478
10-2218	CLASSIFYING CYCLONE	10-2218	640	100	100	100	225	390	478
10-2219	CLASSIFYING CYCLONE	10-2219	640	100	100	100	225	390	478
10-2220	CLASSIFYING CYCLONE	10-2220	640	100	100	100	225	390	478
10-2221	CLASSIFYING CYCLONE	10-2221	640	100	100	100	225	390	478
10-2222	CLASSIFYING CYCLONE	10-2222	640	100	100	100	225	390	478
10-2223	CLASSIFYING CYCLONE	10-2223	640	100	100	100	225	390	478
10-2775	PULVERIZING CYCLONE	10-2775	125	1.5	1.5	1.5	1.5	2.2	1.5
10-2776	PULVERIZING CYCLONE	10-2776	125	1.5	1.5	1.5	1.5	2.2	1.5
10-2777	PULVERIZING CYCLONE	10-2777	125	1.5	1.5	1.5	1.5	2.2	1.5
10-2778	PULVERIZING CYCLONE	10-2778	125	1.5	1.5	1.5	1.5	2.2	1.5
10-2779	PULVERIZING CYCLONE	10-2779	125	1.5	1.5	1.5	1.5	2.2	1.5
10-2780	PULVERIZING CYCLONE	10-2780	125	1.5	1.5	1.5	1.5	2.2	1.5
10-2781	PULVERIZING CYCLONE	10-2781	125	1.5	1.5	1.5	1.5	2.2	1.5
10-2216	STORAGE TANK	10-2216	2,775	1,006	576	576	576	576	576
10-2217	CLASSIFYING CYCLONE	10-2217	2,775	1,006	576	576	576	576	576
10-2218	CLASSIFYING CYCLONE	10-2218	2,775	1,006	576	576	576	576	576
10-2219	CLASSIFYING CYCLONE	10-2219	2,775	1,006	576	576	576	576	576
10-2220	CLASSIFYING CYCLONE	10-2220	2,775	1,006	576	576	576	576	576
10-2221	CLASSIFYING CYCLONE	10-2221	2,775	1,006	576	576	576	576	576
10-2222	CLASSIFYING CYCLONE	10-2222	2,775	1,006	576	576	576	576	576
10-2223	CLASSIFYING CYCLONE	10-2223	2,775	1,006	576	576	576	576	576
10-2775	PULVERIZING CYCLONE	10-2775	2,775	1,006	576	576	576	576	576
10-2776	PULVERIZING CYCLONE	10-2776	2,775	1,006	576	576	576	576	576
10-2777	PULVERIZING CYCLONE	10-2777	2,775	1,006	576	576	576	576	576
10-2778	PULVERIZING CYCLONE	10-2778	2,775	1,006	576	576	576	576	576
10-2779	PULVERIZING CYCLONE	10-2779	2,775	1,006	576	576	576	576	576
10-2780	PULVERIZING CYCLONE	10-2780	2,775	1,006	576	576	576	576	576
10-2781	PULVERIZING CYCLONE	10-2781	2,775	1,006	576	576	576	576	576

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11-3831 BELT SCALE 300 T.P.H.
 11-2862 BIFURCATED CHUTE
 11-2855 BELT FEED BELT CONVEYOR 0-1250 T.P.H.
 11-2852 BIFURCATED CHUTE
 11-2853 BELT FEED BELT CONVEYOR 0-1250 T.P.H.
 11-2851 BIFURCATED CHUTE
 11-2850 THRU 11-2855 VIBRATING FEEDER 0-225 T.P.H.
 11-2858 BELT SCALE
 11-2859 T.P.H.
 11-2857 BELT FEED BELT CONVEYOR
 11-2856 BELT FEED BELT CONVEYOR
 11-2855 BIFURCATED CHUTE
 11-2854 BELT SCALE
 11-2853 BELT SCALE
 11-2852 BELT FEED BELT CONVEYOR
 11-2851 BELT FEED BELT CONVEYOR
 11-2850 THRU 11-2855 VIBRATING FEEDER
 11-2849 BELT SCALE
 11-2848 BELT FEED BELT CONVEYOR
 11-2847 BELT FEED BELT CONVEYOR
 11-2846 HYDRO-AIR SYSTEM
 11-2845 BELT SCALE
 11-2069 BOX BELT CONVEYOR
 11-2068 BELT SCALE
 11-2067 BELT FEED BELT CONVEYOR
 11-2066 BELT FEED BELT CONVEYOR
 11-2065 BELT FEED BELT CONVEYOR
 11-2064 BELT FEED BELT CONVEYOR
 11-2063 BELT FEED BELT CONVEYOR
 11-2062 BELT FEED BELT CONVEYOR
 11-2061 BELT FEED BELT CONVEYOR
 11-2060 BELT FEED BELT CONVEYOR
 11-2059 BELT FEED BELT CONVEYOR
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 11-2052 BELT FEED BELT CONVEYOR
 11-2051 BELT FEED BELT CONVEYOR
 11-2050 BELT FEED BELT CONVEYOR



11-2055 BELT FEED BELT CONVEYOR 0-1250 T.P.H.
 11-2056 BELT FEED BELT CONVEYOR
 11-2057 BELT FEED BELT CONVEYOR
 11-2058 BELT FEED BELT CONVEYOR
 11-2059 BELT FEED BELT CONVEYOR
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 11-2063 BELT FEED BELT CONVEYOR
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 11-2070 BELT FEED BELT CONVEYOR
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 11-2073 BELT FEED BELT CONVEYOR
 11-2074 BELT FEED BELT CONVEYOR
 11-2075 BELT FEED BELT CONVEYOR
 11-2076 BELT FEED BELT CONVEYOR
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 11-2080 BELT FEED BELT CONVEYOR
 11-2081 BELT FEED BELT CONVEYOR
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 11-2099 BELT FEED BELT CONVEYOR
 11-2100 BELT FEED BELT CONVEYOR
 11-2101 BELT FEED BELT CONVEYOR
 11-2102 BELT FEED BELT CONVEYOR
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 11-2108 BELT FEED BELT CONVEYOR
 11-2109 BELT FEED BELT CONVEYOR
 11-2110 BELT FEED BELT CONVEYOR
 11-2111 BELT FEED BELT CONVEYOR
 11-2112 BELT FEED BELT CONVEYOR
 11-2113 BELT FEED BELT CONVEYOR
 11-2114 BELT FEED BELT CONVEYOR
 11-2115 BELT FEED BELT CONVEYOR
 11-2116 BELT FEED BELT CONVEYOR
 11-2117 BELT FEED BELT CONVEYOR
 11-2118 BELT FEED BELT CONVEYOR
 11-2119 BELT FEED BELT CONVEYOR
 11-2120 BELT FEED BELT CONVEYOR
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 11-2122 BELT FEED BELT CONVEYOR
 11-2123 BELT FEED BELT CONVEYOR
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 11-2134 BELT FEED BELT CONVEYOR
 11-2135 BELT FEED BELT CONVEYOR
 11-2136 BELT FEED BELT CONVEYOR
 11-2137 BELT FEED BELT CONVEYOR
 11-2138 BELT FEED BELT CONVEYOR
 11-2139 BELT FEED BELT CONVEYOR
 11-2140 BELT FEED BELT CONVEYOR
 11-2141 BELT FEED BELT CONVEYOR
 11-2142 BELT FEED BELT CONVEYOR
 11-2143 BELT FEED BELT CONVEYOR
 11-2144 BELT FEED BELT CONVEYOR
 11-2145 BELT FEED BELT CONVEYOR
 11-2146 BELT FEED BELT CONVEYOR
 11-2147 BELT FEED BELT CONVEYOR
 11-2148 BELT FEED BELT CONVEYOR
 11-2149 BELT FEED BELT CONVEYOR
 11-2150 BELT FEED BELT CONVEYOR

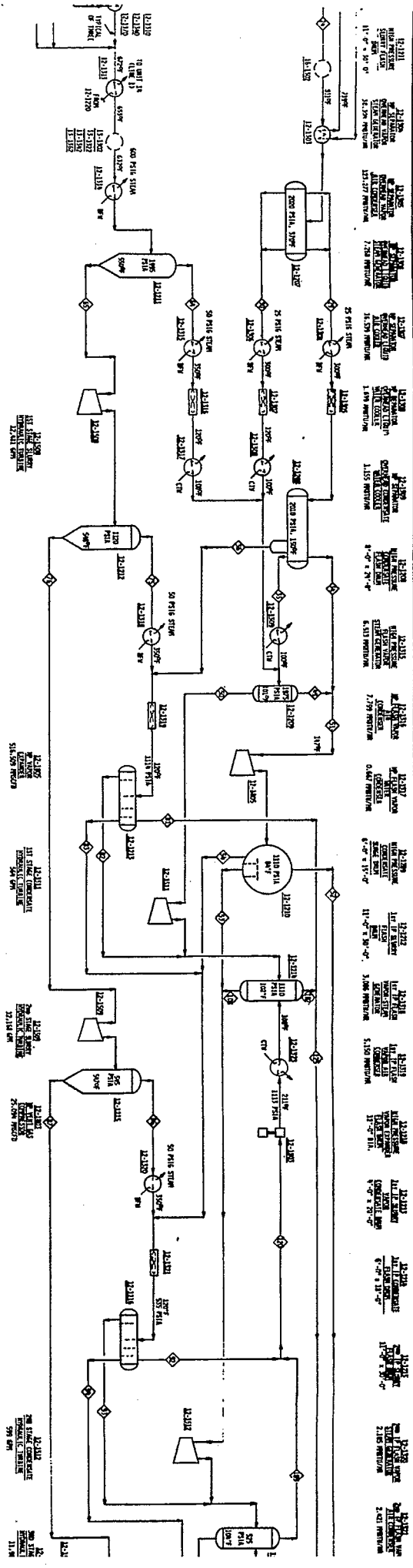
1" - (1) HIGH PRESSURE GASIFIER, UNIT 20
 2" - (1) LOW PRESSURE GASIFIER, UNIT 20
 3" - (1) DISSOLVER, UNIT 12

MPH. SOLIDS, @ 5.1.M.
 SOLIDS, S.F.
 FREE WATER T.P.H.
 PERCENT SOLIDS
 SIZE
 OPERATING WATER.
 DESIGN T.P.H. = 1.2

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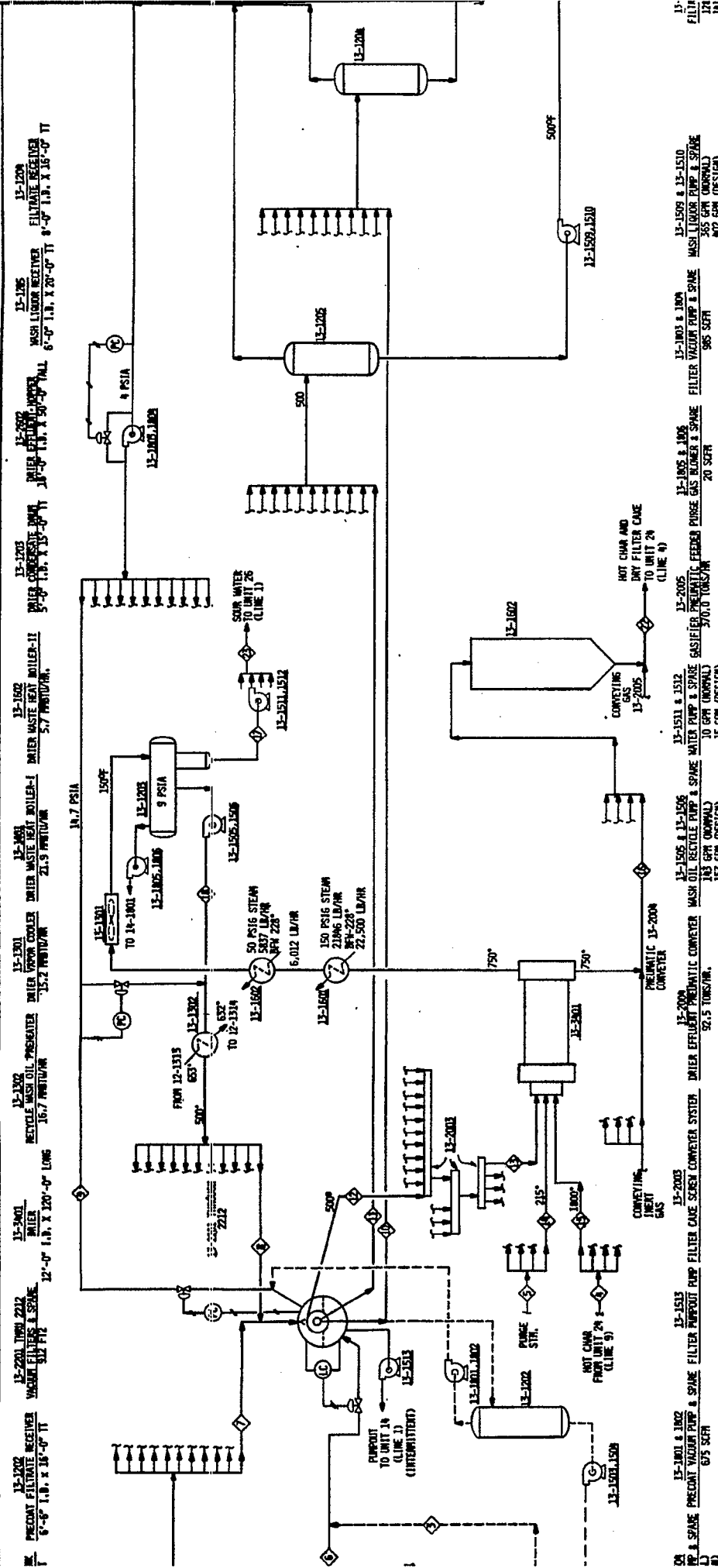
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Item No.	Description	Quantity	Unit	Material	Notes
12-2110	1000 PSI PUMP	1	EA	316 SS	
12-2111	1000 PSI PUMP	1	EA	316 SS	
12-2112	1000 PSI PUMP	1	EA	316 SS	
12-2113	1000 PSI PUMP	1	EA	316 SS	
12-2114	1000 PSI PUMP	1	EA	316 SS	
12-2115	1000 PSI PUMP	1	EA	316 SS	
12-2116	1000 PSI PUMP	1	EA	316 SS	
12-2117	1000 PSI PUMP	1	EA	316 SS	
12-2118	1000 PSI PUMP	1	EA	316 SS	
12-2119	1000 PSI PUMP	1	EA	316 SS	
12-2120	1000 PSI PUMP	1	EA	316 SS	
12-2121	1000 PSI PUMP	1	EA	316 SS	
12-2122	1000 PSI PUMP	1	EA	316 SS	
12-2123	1000 PSI PUMP	1	EA	316 SS	
12-2124	1000 PSI PUMP	1	EA	316 SS	
12-2125	1000 PSI PUMP	1	EA	316 SS	
12-2126	1000 PSI PUMP	1	EA	316 SS	
12-2127	1000 PSI PUMP	1	EA	316 SS	
12-2128	1000 PSI PUMP	1	EA	316 SS	
12-2129	1000 PSI PUMP	1	EA	316 SS	
12-2130	1000 PSI PUMP	1	EA	316 SS	
12-2131	1000 PSI PUMP	1	EA	316 SS	
12-2132	1000 PSI PUMP	1	EA	316 SS	
12-2133	1000 PSI PUMP	1	EA	316 SS	
12-2134	1000 PSI PUMP	1	EA	316 SS	
12-2135	1000 PSI PUMP	1	EA	316 SS	
12-2136	1000 PSI PUMP	1	EA	316 SS	
12-2137	1000 PSI PUMP	1	EA	316 SS	
12-2138	1000 PSI PUMP	1	EA	316 SS	
12-2139	1000 PSI PUMP	1	EA	316 SS	
12-2140	1000 PSI PUMP	1	EA	316 SS	
12-2141	1000 PSI PUMP	1	EA	316 SS	
12-2142	1000 PSI PUMP	1	EA	316 SS	
12-2143	1000 PSI PUMP	1	EA	316 SS	
12-2144	1000 PSI PUMP	1	EA	316 SS	
12-2145	1000 PSI PUMP	1	EA	316 SS	
12-2146	1000 PSI PUMP	1	EA	316 SS	
12-2147	1000 PSI PUMP	1	EA	316 SS	
12-2148	1000 PSI PUMP	1	EA	316 SS	
12-2149	1000 PSI PUMP	1	EA	316 SS	
12-2150	1000 PSI PUMP	1	EA	316 SS	

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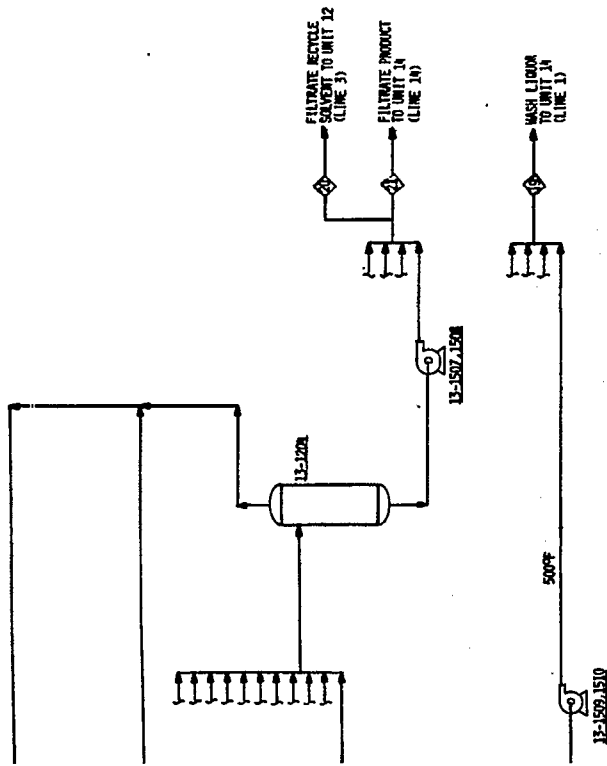
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ITEM	DESCRIPTION	UNIT	QTY	PRICE	TOTAL
13-1501	PREHEAT FILTER RECEIVER	8'-0" I.D. X 18'-0" H	1	12,000	12,000
13-1502	RECYCLE WASH OIL PREHEATER	12'-0" I.D. X 18'-0" H	1	15,000	15,000
13-1503	WASH LIQUOR RECEIVER	6'-0" I.D. X 20'-0" H	1	8,000	8,000
13-1504	WATER EFFLUENT RECEIVER	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1505	DRYER	12'-0" I.D. X 18'-0" H	1	12,000	12,000
13-1506	DRYER	12'-0" I.D. X 18'-0" H	1	12,000	12,000
13-1507	GASIFIER	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1508	GASIFIER	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1509	AIR SEPARATION UNIT	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1510	AIR SEPARATION UNIT	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1511	PUMP	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1512	PUMP	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1513	HEAT EXCHANGER	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1514	HEAT EXCHANGER	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1515	PRODUCT HANDLING UNIT	10'-0" I.D. X 30'-0" H	1	15,000	15,000
13-1516	PRODUCT HANDLING UNIT	10'-0" I.D. X 30'-0" H	1	15,000	15,000

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13-1509
 FILTERATE RECYLE
 8" ID, 10' L, 15'-0" TT



- NOTES:
- EXCEPT FOR 13-2001, 13-2601, 13-2602, 13-2002, 13-2003, 13-2004, 13-2005, ALL EQUIPMENT NUMBERS ARE FOR ONE TRAIN OF FOUR (TRAIN A), FOR TRAIN B, EQUIPMENT NUMBERS START AT 20 (E.G., 13-2201, 13-2202, 13-2203, 13-2204, 13-2205), FOR TRAIN C, EQUIPMENT NUMBERS START AT 40 (E.G., 13-2401, 13-2402, 13-2403, 13-2404, 13-2405), FOR TRAIN D, EQUIPMENT NUMBERS START AT 60 (E.G., 13-2601, 13-2602, 13-2603, 13-2604, 13-2605).
 - PRETREATING PIPING IS TYPICAL FOR EACH FILTER IN THE TRAIN, ONE PRETREAT SYSTEM PER TRAIN.
 - "D.E." REFERS TO DIATOMACEOUS EARTH PRECOAT MATERIAL.

13-1507 & 13-1508
 FILTERATE PUMP & SPARE
 1205 GPM (NORMAL)
 1414 GPM (DESIGN)

13-1509 & 13-1510
 WASH LIQUOR PUMP & SPARE
 740 GPM (NORMAL)
 848 GPM (DESIGN)

ITEM	QTY	UNIT	PRICE	TOTAL
13-1507 & 13-1508	1	UNIT	221.07	221.07
13-1509 & 13-1510	1	UNIT	221.07	221.07
PIPE	11.00	LB	21.87	240.57
VALVES	1.00	EA	40.00	40.00
EL. WORK	1.00	HR	12.00	12.00
TOTAL				534.71

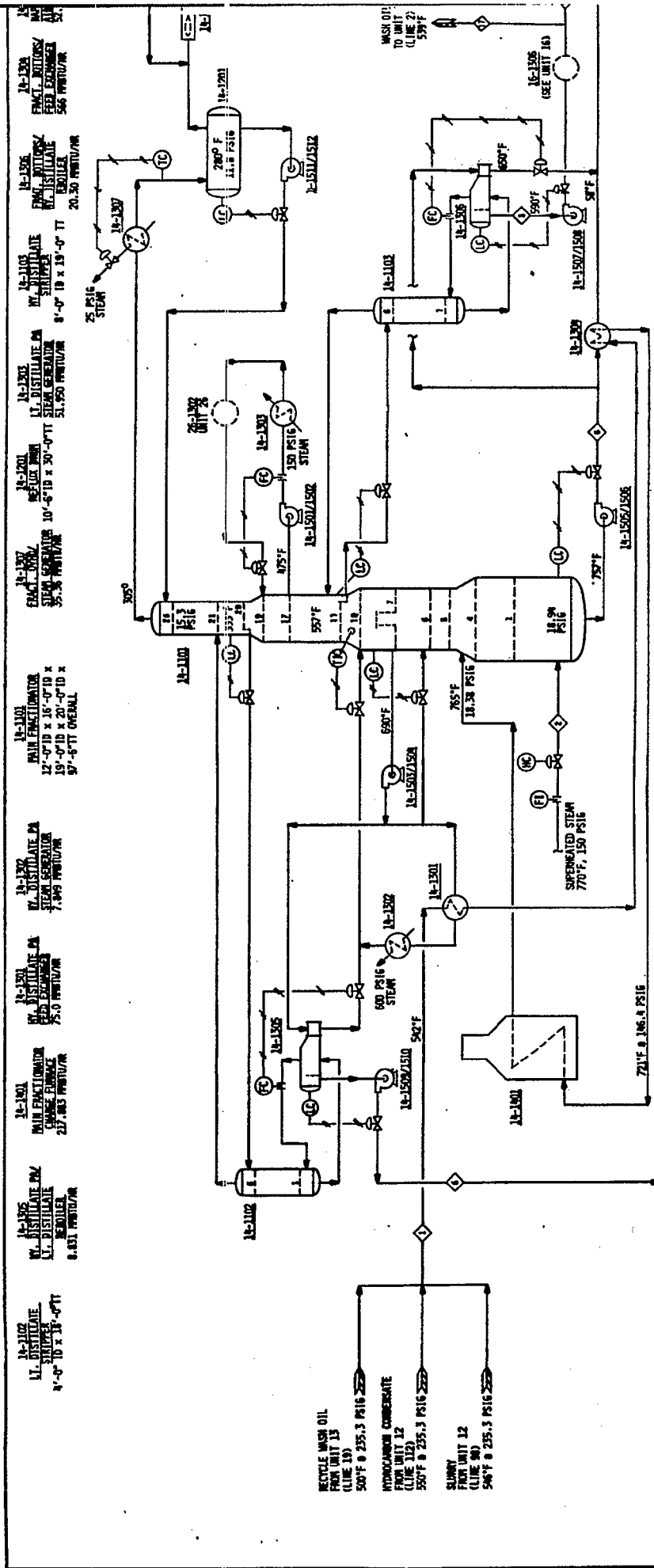
NO.	DATE	BY	REVISION	DESCRIPTION
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ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (EDDA-FE)
 OIL/GAS PLANT
 PROCESS FLOW DIAGRAM
 FILTRATION & FILTER CASE DRYING - UNIT 13

THE BAKER ENGINEERING COMPANY
 PASADENA, CALIFORNIA

DATE: 5/25-2
 SHEET NO.: R-13-FS-1
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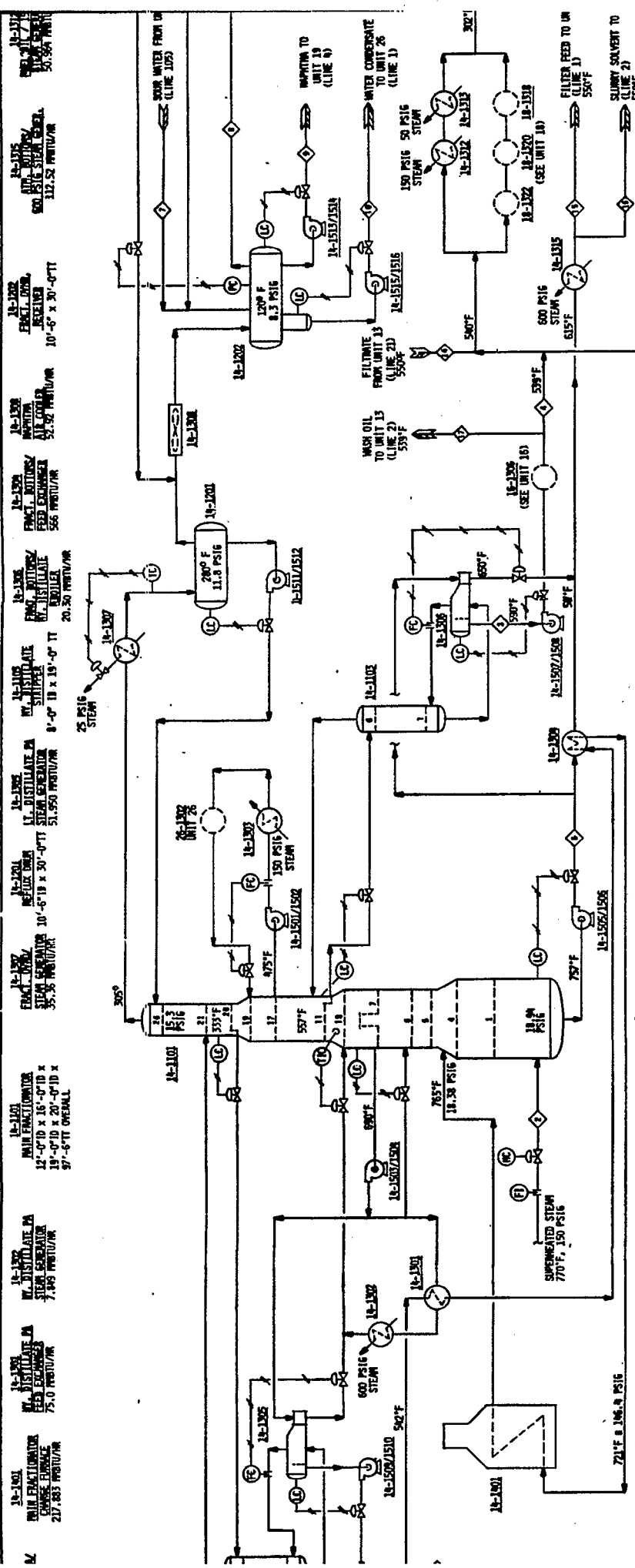
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14-1500/1510 LT. DISTILLATE UNIT 250 GPM

COMPONENT	FRACTIONATOR FEED	STRIPPING STEAM	HEAVY DISTILLATE PRODUCT & RECYCLE	HEAVY DISTILLATE PRODUCT	AVN. BOTTOMS	LIQUENT DISTILLATE	COMPONENT	WATER CUMULATIVE (2500 UNIT 14)	OWNR	STARTMA	WATER CUMULATIVE IN UNIT 14	14-1511/1512 RECYCLE UNIT 140 GPM
% MOLES/HR	MMBtu	MMBtu	MMBtu	MMBtu	MMBtu	MMBtu	% MOLES/HR	MMBtu	MMBtu	MMBtu	MMBtu	MMBtu
CO	118.37						CO	117.97	12.28	0.28	0.28	128.37
CB	65.75						CB	65.44	65.44	0.31	0.31	133.81
CC	24.31						CC	24.31	24.31	0.78	0.78	149.40
CD	82.43						CD	82.43	82.43	2.49	2.49	161.89
CE	138.47						CE	138.47	138.47	7.49	7.49	179.38
CF	185.09						CF	185.09	185.09	12.98	12.98	192.36
CG	251.09						CG	251.09	251.09	18.47	18.47	210.83
CH	317.10						CH	317.10	317.10	23.96	23.96	227.79
CI	403.19						CI	403.19	403.19	29.45	29.45	247.24
CII	519.18						CII	519.18	519.18	34.94	34.94	262.18
CIII	655.18						CIII	655.18	655.18	40.43	40.43	277.13
CIV	811.17						CIV	811.17	811.17	45.92	45.92	292.07
CV	987.16						CV	987.16	987.16	51.41	51.41	307.02
CVI	1183.15						CVI	1183.15	1183.15	56.90	56.90	321.96
CVII	1399.14						CVII	1399.14	1399.14	62.39	62.39	336.91
CVIII	1635.13						CVIII	1635.13	1635.13	67.88	67.88	351.85
CVIX	1891.12						CVIX	1891.12	1891.12	73.37	73.37	366.80
COAL (NET)	41.04						COAL (NET)	41.04	41.04	78.86	78.86	381.74
TOTAL MOLES/HR	19,152.17	3,437.01	3,057.68	689.68	689.67	TOTAL MOLES/HR	19,152.17	2,749.84	887.57	1,861.66	1,045.81	1,003.18
MMBtu/HR	7,012.11	9,023.11	4,041.18	1,072.28	1,072.27	MMBtu/HR	7,012.11	3,512.81	332.99	2,108.99	1,129.12	594.59
SPR	498.093		31,841	10,978	381,732	SPR	498.093	3,927	81.81	1,041	1,313	1,313
LT. DISTILLATE	0.4072	18.08	8,765	8,765	10,106	LT. DISTILLATE	0.4072	7,749	36.44	1,139	8,093	8,093

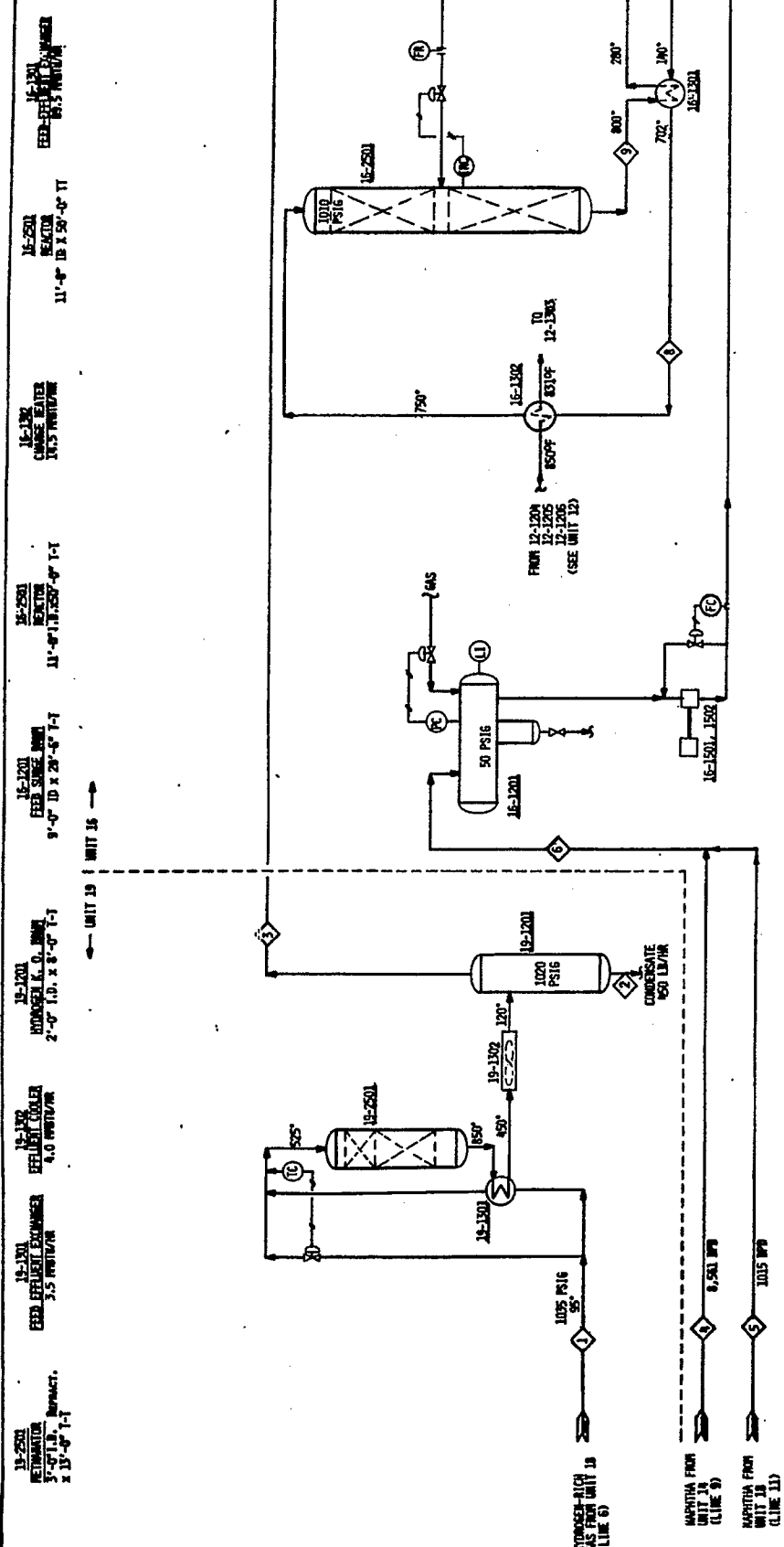
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COMPONENT	FRAC. UNIT 13	STRIPPING STEAM	HEAVY DISTILLATE PRODUCT & RECYCLE	HEAVY DISTILLATE PRODUCT	ATM. BOTTOMS	LIGHT DISTILLATE	COMPONENT	WATER CONDENSATE TO UNIT 16	HEAVY GAS FROTH UNIT 16	PVIL OIL	FIL. FILTERATE FROTH UNIT 16
Nr. MOLES/Wr											
1A-1301	119.25	3,497.00						18.97	18.97		
1A-1302	28.27						2.09	2.09			
1A-1303	28.27						2.09	2.09			
1A-1304	28.27						2.09	2.09			
1A-1305	28.27						2.09	2.09			
1A-1306	28.27						2.09	2.09			
1A-1307	28.27						2.09	2.09			
1A-1308	28.27						2.09	2.09			
1A-1309	28.27						2.09	2.09			
1A-1310	28.27						2.09	2.09			
1A-1311	28.27						2.09	2.09			
1A-1312	28.27						2.09	2.09			
1A-1313	28.27						2.09	2.09			
1A-1314	28.27						2.09	2.09			
1A-1315	28.27						2.09	2.09			
1A-1316	28.27						2.09	2.09			
1A-1317	28.27						2.09	2.09			
1A-1318	28.27						2.09	2.09			
1A-1319	28.27						2.09	2.09			
1A-1320	28.27						2.09	2.09			
1A-1321	28.27						2.09	2.09			
1A-1322	28.27						2.09	2.09			
1A-1323	28.27						2.09	2.09			
1A-1324	28.27						2.09	2.09			
1A-1325	28.27						2.09	2.09			
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1A-1327	28.27						2.09	2.09			
1A-1328	28.27						2.09	2.09			
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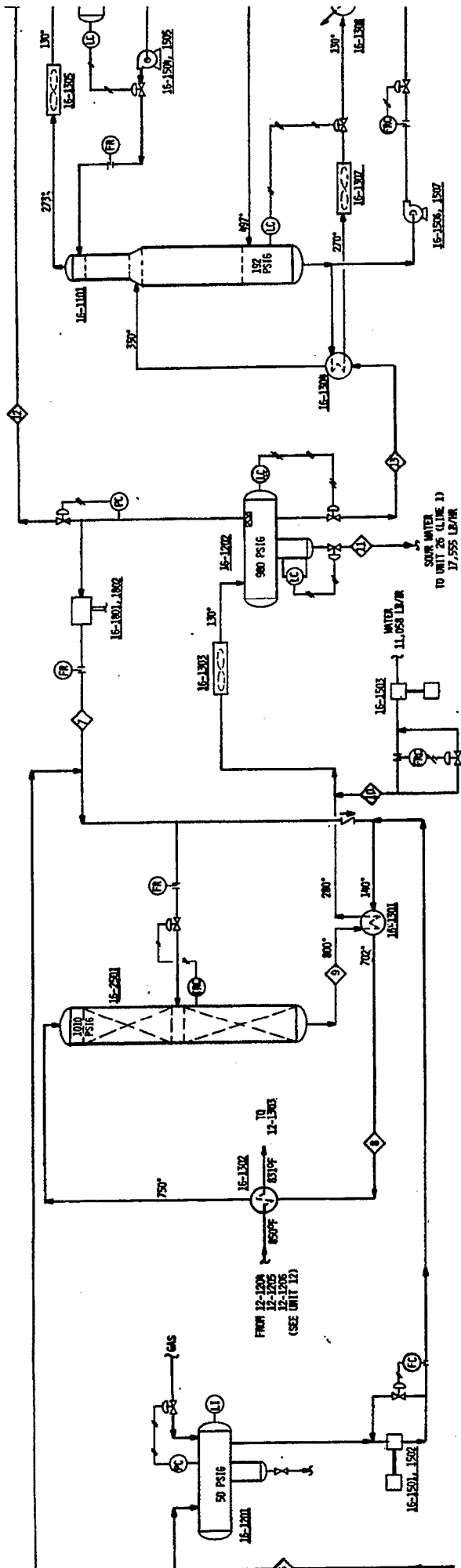


16-1501, 1502
ENGINE-TYPE & FRAME
310 GPM (NORMAL)
505 GPM (BESTER)

STREAM NO.	STREAM NAME	M2 MOLES/YR	CONDENSATE	HT TO UNIT 16	MAPHTHA FROM UNIT 14	MAPHTHA FROM UNIT 18	TOTAL MAPHTHA	RECYLEE M2	TOTAL TO REACTOR	TOTAL H2O REACTOR
H2-RICH GAS		1,018.75						8,046.39	8,046.39	8,046.39
H2		10.38					34	791.49	8,123.17	8,123.17
CO		38.62					59	21.57	21.57	21.57
NH3							1.28	6.79	6.79	6.79
H2O							0.43	2.49	2.49	2.49
CH4							8.44	49.41	49.41	49.41
C2							2.08	12.08	12.08	12.08
C3							8.79	50.17	50.17	50.17
C4							48.02	278.18	278.18	278.18
18P-200							31.58	182.62	182.62	182.62
488-488							10.38	60.14	60.14	60.14
18P-200							1.00	5.58	5.58	5.58
18P-200							61.77	348.32	348.32	348.32
488-488							31.58	182.62	182.62	182.62
18P-200							115.58	658.79	658.79	658.79
488-488							10.38	60.14	60.14	60.14
TOTAL		2,148.19	34.88	1,001.67	1,018.75	316.17	1,636.69	14,217.76	14,217.76	14,217.76
18P-200							429.88	2,421.95	2,421.95	2,421.95
488-488							348.84	1,988.59	1,988.59	1,988.59
18P							102.51	589.99	589.99	589.99
18P							102.51	589.99	589.99	589.99
18P/MAL							1,648	11,682	11,682	11,682

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16-1201
 FEED STREAM HEATER
 9'-0" ID X 20'-0" T-T
 11.5 MW (DESIGN)
 16-1202
 CHARGE HEATER
 11'-0" ID X 11.520'-0" T-T
 11.5 MW (DESIGN)
 16-1203
 REACTOR
 11'-0" ID X 50'-0" TT
 16-1204
 REACTOR
 11'-0" ID X 50'-0" TT
 16-1205
 FEED-EFFLUENT EXCHANGER
 8'-0" ID X 20'-0" T-T
 16-1206
 EFFLUENT COOLER
 7'-0" ID X 12'-0" T-T
 16-1207
 PRODUCT SEPARATOR
 7'-0" ID X 12'-0" T-T
 16-1208
 STABILIZER FEED-WATERS EXCHANGER
 13.5 MW (DESIGN)
 16-1209
 STABILIZER
 8'-0" ID X 10'-0" ID
 55'-0" T-T
 16-1210
 STABILIZER
 8'-0" ID X 10'-0" ID
 55'-0" T-T
 16-1211
 PRODUCT AIR COOLER
 9'-3" DIA/10' H
 16-1212
 STABILIZER REHEATER
 8'-6" DIA/10' H

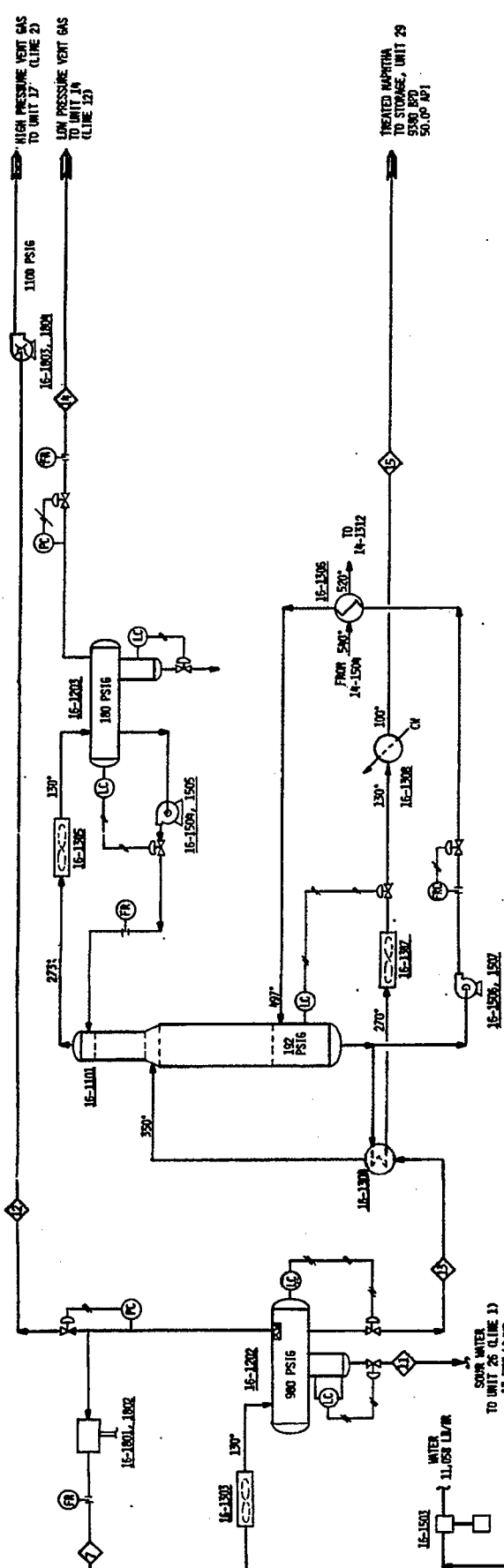


16-1501, 1502
 CONDENSER
 325 GPM (DESIGN)
 16-1503
 WATER INJECTOR
 25 GPM (DESIGN)
 16-1504
 RECYCLE COMPRESSOR & SPARGE
 26.8 MW (DESIGN)
 16-1505
 RECYCLE COMPRESSOR & SPARGE
 26.8 MW (DESIGN)
 16-1506, 1507
 STABILIZER REHEATER PUMP & SPARGE
 1020 GPM (NORMAL)
 1020 GPM (DESIGN)
 16-1508
 STABILIZER REHEATER
 100 GPM (DE)

STREAM NO.	STREAM NAME	PSI/INCHES/HOUR	TEMPERATURE (°F)	PHASE	FLOW RATE (GPM)	HEAT DUTY (BTU/HOUR)	ENTHALPY (BTU/LB)	ENTHALPY CHANGE (BTU/LB)	HEAT DUTY (BTU/HOUR)
1	16-1201	50	750	LIQUID	1000	1000000	1000	1000	1000000
2	16-1202	150	750	LIQUID	1000	1000000	1000	1000	1000000
3	16-1203	150	750	LIQUID	1000	1000000	1000	1000	1000000
4	16-1204	150	750	LIQUID	1000	1000000	1000	1000	1000000
5	16-1205	150	750	LIQUID	1000	1000000	1000	1000	1000000
6	16-1206	150	750	LIQUID	1000	1000000	1000	1000	1000000
7	16-1207	150	750	LIQUID	1000	1000000	1000	1000	1000000
8	16-1208	150	750	LIQUID	1000	1000000	1000	1000	1000000
9	16-1209	150	750	LIQUID	1000	1000000	1000	1000	1000000
10	16-1210	150	750	LIQUID	1000	1000000	1000	1000	1000000
11	16-1211	150	750	LIQUID	1000	1000000	1000	1000	1000000
12	16-1212	150	750	LIQUID	1000	1000000	1000	1000	1000000
13	16-1501	150	750	LIQUID	1000	1000000	1000	1000	1000000
14	16-1502	150	750	LIQUID	1000	1000000	1000	1000	1000000
15	16-1503	150	750	LIQUID	1000	1000000	1000	1000	1000000
16	16-1504	150	750	LIQUID	1000	1000000	1000	1000	1000000
17	16-1505	150	750	LIQUID	1000	1000000	1000	1000	1000000
18	16-1506	150	750	LIQUID	1000	1000000	1000	1000	1000000
19	16-1507	150	750	LIQUID	1000	1000000	1000	1000	1000000
20	16-1508	150	750	LIQUID	1000	1000000	1000	1000	1000000

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- 16-1303 RECYCLE WATER COOLER 24.5 GPM/HR
- 16-1304 RECYCLE WATER COOLER 7'-0" ID X 12'-0" L-T
- 16-1305 STABILIZER FEED-WITNESS EXCHANGER 15.5 GPM/HR
- 16-1306 STABILIZER FEED COOLER 4'-0" ID X 10'-0" L-T
- 16-1307 PRODUCT WATER COOLER 1.4 GPM/HR
- 16-1308 STABILIZER COND AIR COOLER 4.6 GPM/HR
- 16-1309 STABILIZER COND AIR COOLER 3.7 GPM/HR
- 16-1310 STABILIZER 500 PSIG 900 PSIG
- 16-1311 STABILIZER 180 PSIG
- 16-1312 STABILIZER RECEIVER 6'-0" ID X 10'-0" L-T
- 16-1313 STABILIZER REBUILDER 27.5 GPM/HR

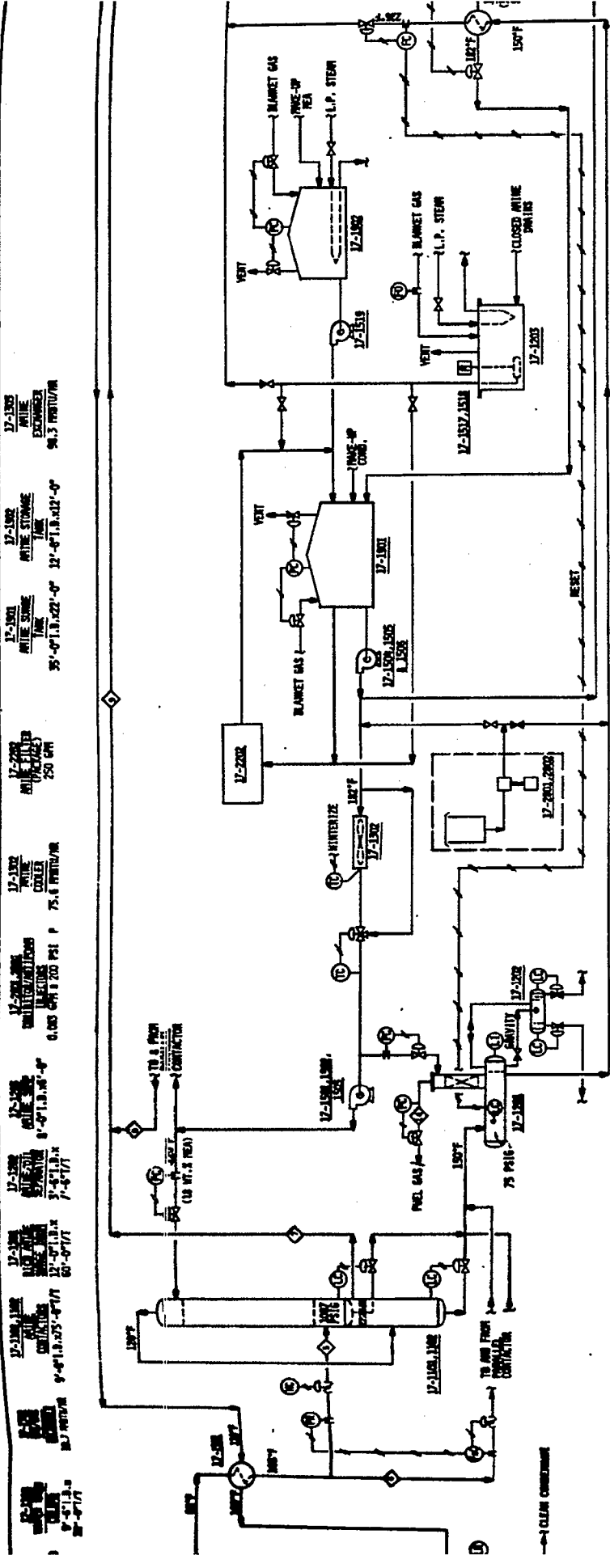


UNIT	NAME	TYPE	DESIGN	STATUS
16-1301	RECYCLE WATER COOLER	COOLER	DESIGN	ISSUED FOR REPORT
16-1302	RECYCLE WATER COOLER	COOLER	DESIGN	ISSUED FOR REPORT
16-1303	STABILIZER FEED-WITNESS EXCHANGER	EXCHANGER	DESIGN	ISSUED FOR REPORT
16-1304	STABILIZER FEED COOLER	COOLER	DESIGN	ISSUED FOR REPORT
16-1305	PRODUCT WATER COOLER	COOLER	DESIGN	ISSUED FOR REPORT
16-1306	STABILIZER COND AIR COOLER	COOLER	DESIGN	ISSUED FOR REPORT
16-1307	STABILIZER COND AIR COOLER	COOLER	DESIGN	ISSUED FOR REPORT
16-1308	STABILIZER FEED COOLER	COOLER	DESIGN	ISSUED FOR REPORT
16-1309	STABILIZER	STABILIZER	DESIGN	ISSUED FOR REPORT
16-1310	STABILIZER	STABILIZER	DESIGN	ISSUED FOR REPORT
16-1311	STABILIZER	STABILIZER	DESIGN	ISSUED FOR REPORT
16-1312	STABILIZER RECEIVER	RECEIVER	DESIGN	ISSUED FOR REPORT
16-1313	STABILIZER REBUILDER	REBUILDER	DESIGN	ISSUED FOR REPORT

STREAM NO.	STREAM NAME	PSIG	TEMP (°F)	TYPE
1	FROM UNIT 29	500	140	LIQUID
2	TO UNIT 29	500	140	LIQUID
3	FROM UNIT 29	500	140	LIQUID
4	TO UNIT 29	500	140	LIQUID
5	FROM UNIT 29	500	140	LIQUID
6	TO UNIT 29	500	140	LIQUID
7	FROM UNIT 29	500	140	LIQUID
8	TO UNIT 29	500	140	LIQUID
9	FROM UNIT 29	500	140	LIQUID
10	TO UNIT 29	500	140	LIQUID
11	FROM UNIT 29	500	140	LIQUID
12	TO UNIT 29	500	140	LIQUID
13	FROM UNIT 29	500	140	LIQUID
14	TO UNIT 29	500	140	LIQUID
15	FROM UNIT 29	500	140	LIQUID
16	TO UNIT 29	500	140	LIQUID
17	FROM UNIT 29	500	140	LIQUID
18	TO UNIT 29	500	140	LIQUID
19	FROM UNIT 29	500	140	LIQUID
20	TO UNIT 29	500	140	LIQUID
21	FROM UNIT 29	500	140	LIQUID
22	TO UNIT 29	500	140	LIQUID
23	FROM UNIT 29	500	140	LIQUID
24	TO UNIT 29	500	140	LIQUID
25	FROM UNIT 29	500	140	LIQUID
26	TO UNIT 29	500	140	LIQUID
27	FROM UNIT 29	500	140	LIQUID
28	TO UNIT 29	500	140	LIQUID
29	FROM UNIT 29	500	140	LIQUID
30	TO UNIT 29	500	140	LIQUID
31	FROM UNIT 29	500	140	LIQUID
32	TO UNIT 29	500	140	LIQUID
33	FROM UNIT 29	500	140	LIQUID
34	TO UNIT 29	500	140	LIQUID
35	FROM UNIT 29	500	140	LIQUID
36	TO UNIT 29	500	140	LIQUID
37	FROM UNIT 29	500	140	LIQUID
38	TO UNIT 29	500	140	LIQUID
39	FROM UNIT 29	500	140	LIQUID
40	TO UNIT 29	500	140	LIQUID
41	FROM UNIT 29	500	140	LIQUID
42	TO UNIT 29	500	140	LIQUID
43	FROM UNIT 29	500	140	LIQUID
44	TO UNIT 29	500	140	LIQUID
45	FROM UNIT 29	500	140	LIQUID
46	TO UNIT 29	500	140	LIQUID
47	FROM UNIT 29	500	140	LIQUID
48	TO UNIT 29	500	140	LIQUID
49	FROM UNIT 29	500	140	LIQUID
50	TO UNIT 29	500	140	LIQUID

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12-1509, 1505, 1506
 AMINE REBOILER
 PUMP & SPARE
 1305 GPM @ 60 PSI AP

12-1510, 1511, 1512
 AMINE STORAGE
 TANK
 50 GPM @ 60 PSI AP

12-1513, 1514
 AMINE STORAGE
 TANK
 50 GPM @ 60 PSI AP

COMP		TANK	
NO.	WELLFLOW	NO.	WELLFLOW
1	1.000	10	11.000
2	1.000	11	11.000
3	1.000	12	11.000
4	1.000	13	11.000
5	1.000	14	11.000
6	1.000	15	11.000
7	1.000	16	11.000
8	1.000	17	11.000
9	1.000	18	11.000
10	1.000	19	11.000
11	1.000	20	11.000
12	1.000	21	11.000
13	1.000	22	11.000
14	1.000	23	11.000
15	1.000	24	11.000
16	1.000	25	11.000
17	1.000	26	11.000
18	1.000	27	11.000
19	1.000	28	11.000
20	1.000	29	11.000
21	1.000	30	11.000
22	1.000	31	11.000
23	1.000	32	11.000
24	1.000	33	11.000
25	1.000	34	11.000
26	1.000	35	11.000
27	1.000	36	11.000
28	1.000	37	11.000
29	1.000	38	11.000
30	1.000	39	11.000
31	1.000	40	11.000
32	1.000	41	11.000
33	1.000	42	11.000
34	1.000	43	11.000
35	1.000	44	11.000
36	1.000	45	11.000
37	1.000	46	11.000
38	1.000	47	11.000
39	1.000	48	11.000
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75	1.000	84	11.000
76	1.000	85	11.000
77	1.000	86	11.000
78	1.000	87	11.000
79	1.000	88	11.000
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83	1.000	92	11.000
84	1.000	93	11.000
85	1.000	94	11.000
86	1.000	95	11.000
87	1.000	96	11.000
88	1.000	97	11.000
89	1.000	98	11.000
90	1.000	99	11.000
91	1.000	100	11.000

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17-1005
CAUSTIC STORAGE
TANK
20'-0" I.D. x 20'-0" H

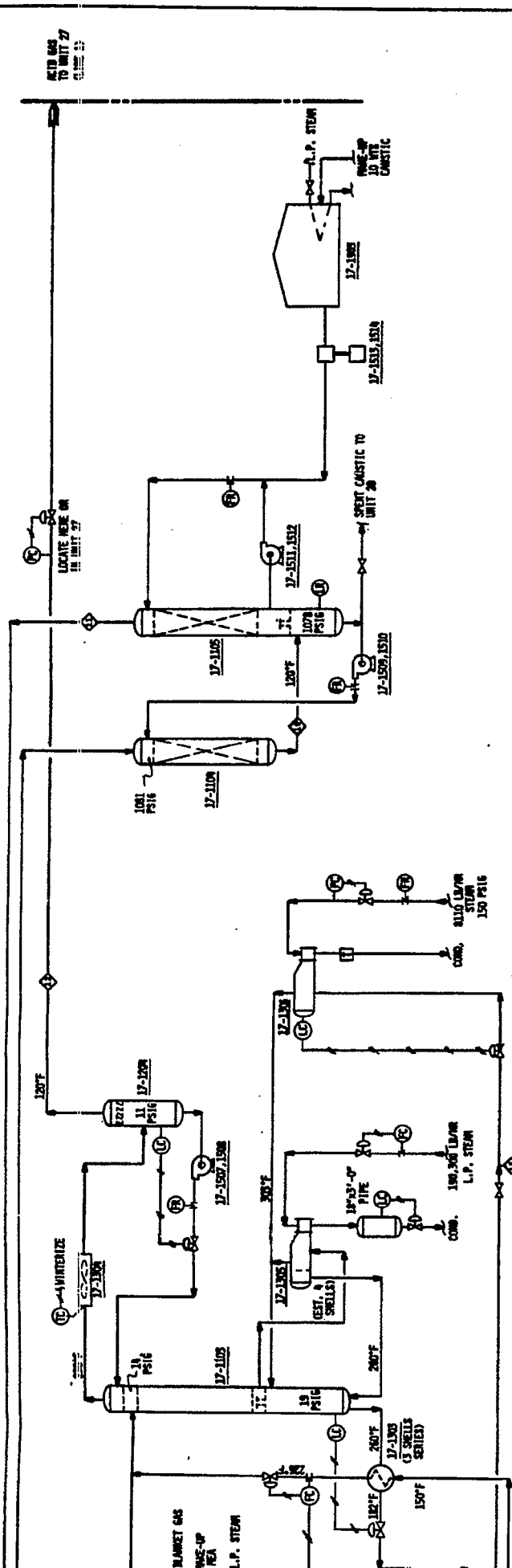
17-1105
CAUSTIC
CONTRACTOR
5'-0" I.D. x 20'-0" H

17-1106
CAUSTIC
PRECONTRACTOR
5'-0" I.D. x 20'-0" H

17-1107
MINE
REDUCER
7'-0" I.D. x 12'-0" H

17-1108
MINE
REROLLER
10'-0" I.D. x 12'-0" H

17-1109
MINE
CONDENSER
10'-0" I.D. x 12'-0" H



17-1509, 1510
MINE REDUCER
PUMP & SPRING
80 GPM @ 60 PSI @ P

17-1511, 1512
MINE REDUCER
PUMP & SPRING
250 GPM @ 90 PSI @ P

17-1513, 1514
MINE REDUCER
PUMP & SPRING
7 GPM @ 1120 PSI @ P

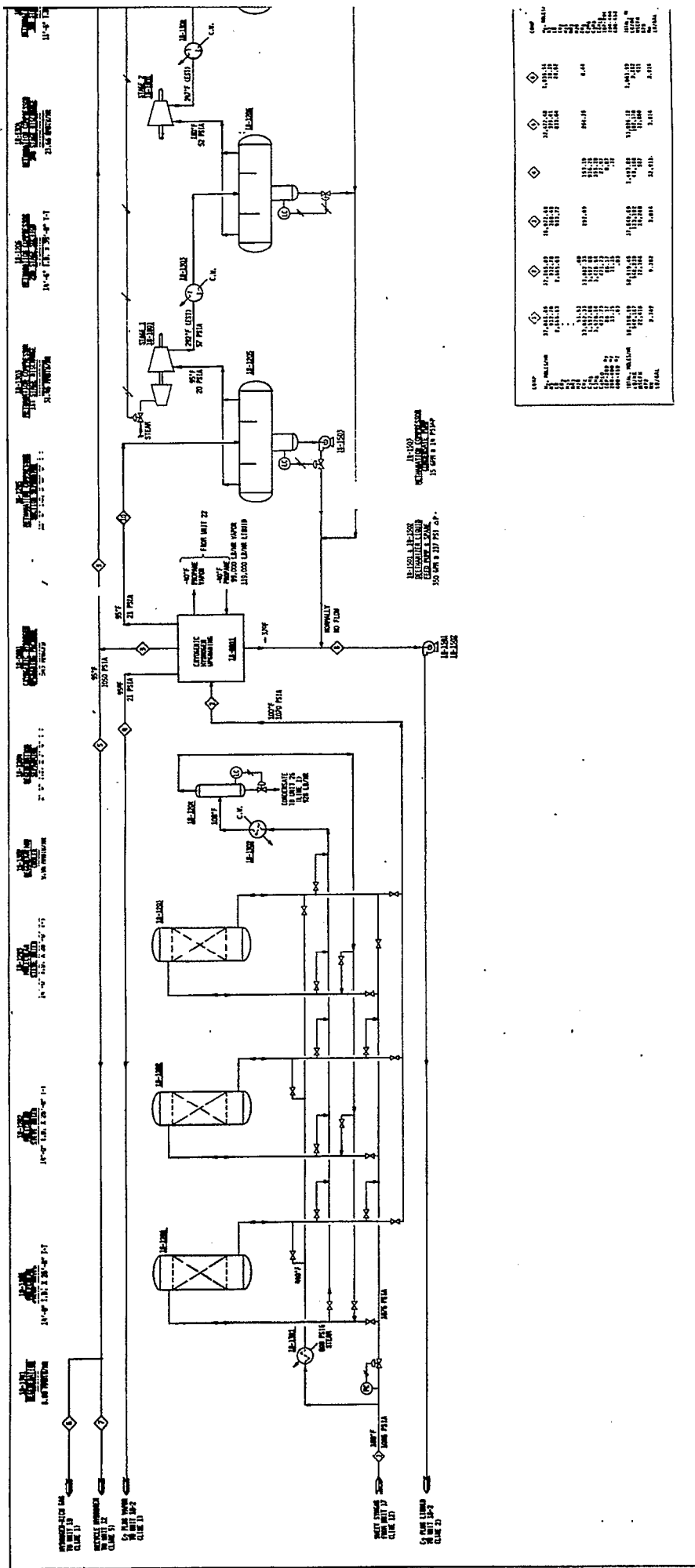
17-1507, 1508
MINE REDUCER
PUMP & SPRING
200 GPM @ 65 PSI @ P

COMP	MINE REDUCER	MINE REDUCER
17-1507	17-1508	17-1509
17-1511	17-1512	17-1513
17-1514		
17-1507	17-1508	17-1509
17-1511	17-1512	17-1513
17-1514		
17-1507	17-1508	17-1509
17-1511	17-1512	17-1513
17-1514		

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR REVIEW	1/2/66	
2			
3			
4			
5			
6			
7			
8			
9			
10			

ERDT RESEARCH & DEVELOPMENT ADMINISTRATION ©2004-PE
 OIL/GAS PLANT
 PROCESS FLOW DIAGRAM
 DISSOLVED ACID GAS SERVICE - UNIT 17
 THE HALL IN PROCESS COMPANY
 5100 W. 130th Street, Overland Park, KS 66204
 DATE: 8-13-99-1
 SHEET NO. 505-2

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COMP.	12.500 PSI	100 PSI	21 PSI	12.500 PSI
12.500 PSI	12.500	100	21	12.500
100 PSI	100	100	100	100
21 PSI	21	21	21	21
12.500 PSI	12.500	12.500	12.500	12.500
TOTAL	25250	2000	420	25250

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18-1212
 REFRIGERANT
 COMPRESSOR
 SECTION SEPARATOR
 6'-8" DIA. (6'-8" T/1)
 3.62 HP (1000 W)

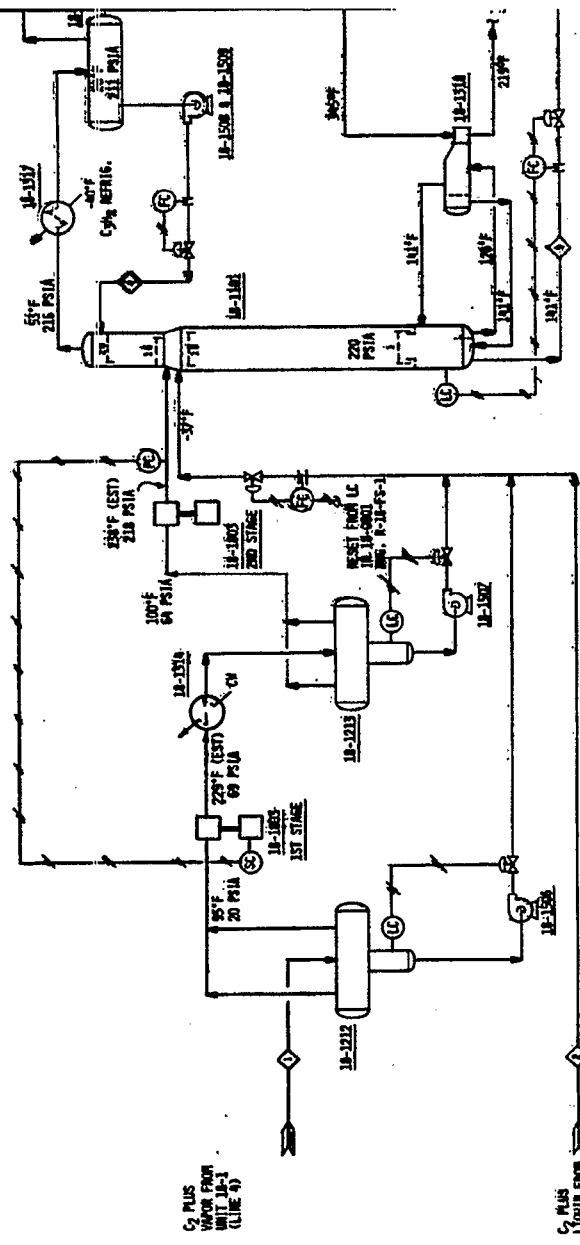
18-1311
 REFRIGERANT
 COMPRESSOR
 1ST STAGE DISCHARGE
 INTERCOOLER
 4'-0" DIA. (4'-0" T/1)

18-1213
 REFRIGERANT
 COMPRESSOR
 2ND STAGE SECTION
 SEPARATOR
 4'-0" DIA. (4'-0" T/1)

18-1316
 REFRIGERANT
 CONDENSER
 6'-0" DIA. (6'-0" T/1)
 OVERALL = 61'-0" T/1

18-1317
 REFRIGERANT
 CONDENSER
 6'-0" DIA. (6'-0" T/1)

18-1314
 REFRIGERANT
 CONDENSER
 4'-0" DIA. (4'-0" T/1)



18-1505
 REFRIGERANT
 COMPRESSOR NO. 1
 CONDENSATE PUMP
 15 GPM @ 211 PSI AP

18-1507
 REFRIGERANT
 COMPRESSOR NO. 2
 CONDENSATE PUMP
 15 GPM @ 161 PSI AP

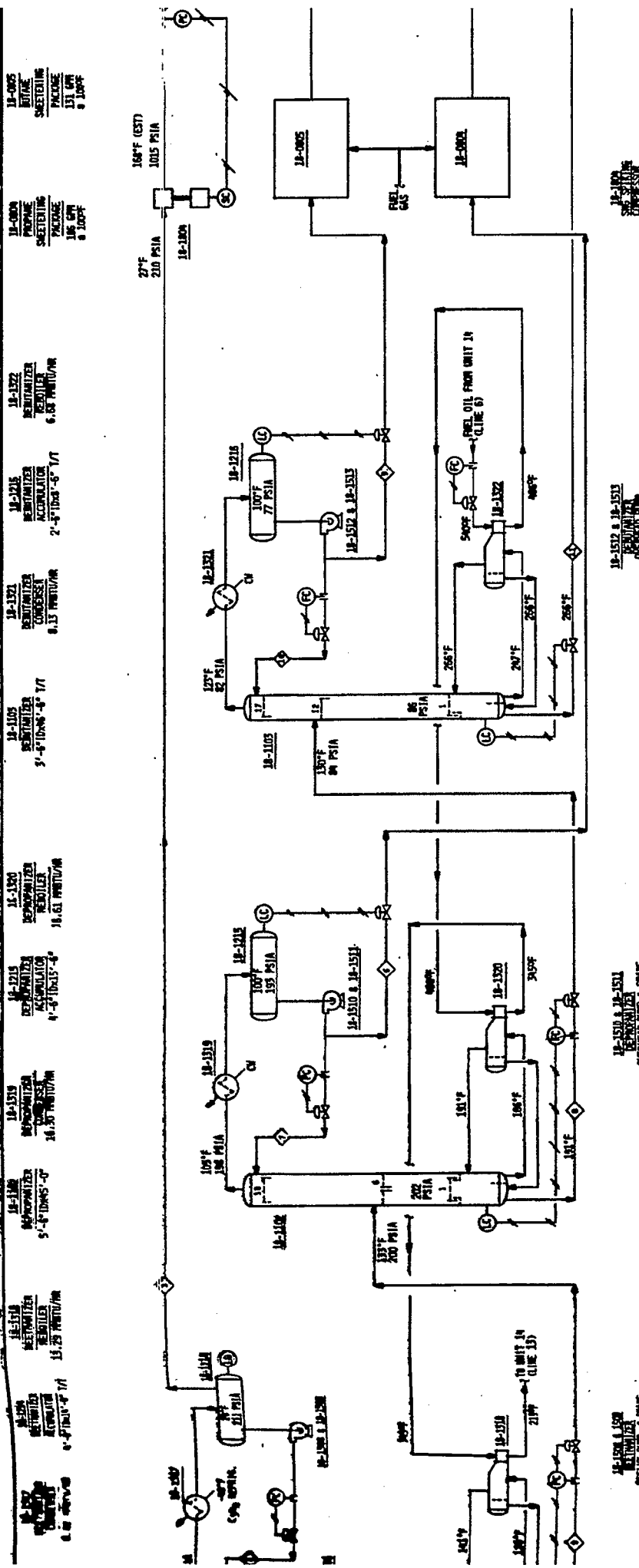
18-1508 & 1509
 REFRIGERANT
 RETURN PUMP & SPRAY
 200 GPM @ 26 PSI AP

COMP	COL. MILES/YR	TRUCK MILES/YR	TRUCK MILES/HR
1	101.25	1,485.00	11.67
2	101.25	1,485.00	11.67
3	101.25	1,485.00	11.67
4	101.25	1,485.00	11.67
5	101.25	1,485.00	11.67
6	101.25	1,485.00	11.67
7	101.25	1,485.00	11.67
8	101.25	1,485.00	11.67
9	101.25	1,485.00	11.67
10	101.25	1,485.00	11.67
11	101.25	1,485.00	11.67
12	101.25	1,485.00	11.67
13	101.25	1,485.00	11.67
14	101.25	1,485.00	11.67
15	101.25	1,485.00	11.67
16	101.25	1,485.00	11.67
17	101.25	1,485.00	11.67
18	101.25	1,485.00	11.67
19	101.25	1,485.00	11.67
20	101.25	1,485.00	11.67

O₂ PLUS
 VAPOR FROM
 UNIT 18-1
 (LINE 4)

O₂ PLUS
 LIQUID FROM
 UNIT 18-1
 (LINE 8)

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- 18-005 BUTANE SHEETING PACKAGE 131 GPM @ 100°F
- 18-008 PROPANE SHEETING PACKAGE 136 GPM @ 100°F
- 18-1322 IDENTIFIER REFRIG. 6.68 MMTU/HR
- 18-1325 IDENTIFIER ACCUMULATOR 2'-8" DIA x 4'-5" H/T
- 18-1321 IDENTIFIER COMPRESSOR 0.33 MMTU/HR
- 18-1105 IDENTIFIER 3'-8" DIA x 4'-8" H/T
- 18-1320 IDENTIFIER REFRIG. 18.61 MMTU/HR
- 18-1325 IDENTIFIER ACCUMULATOR 4'-2" DIA x 15'-4" H/T
- 18-1329 IDENTIFIER COMPRESSOR 16.57 MMTU/HR
- 18-1328 IDENTIFIER 5'-8" DIA x 5'-7" H/T
- 18-1324 IDENTIFIER REFRIG. 13.75 MMTU/HR
- 18-1327 IDENTIFIER REFRIG. 13.75 MMTU/HR
- 18-1326 IDENTIFIER REFRIG. 13.75 MMTU/HR
- 18-1323 IDENTIFIER REFRIG. 13.75 MMTU/HR
- 18-1322 IDENTIFIER REFRIG. 13.75 MMTU/HR
- 18-1321 IDENTIFIER REFRIG. 13.75 MMTU/HR

18-1322 & 18-1323
IDENTIFIER
OVERHEAD PUMP
220 GPM @ 27 PSI ΔP

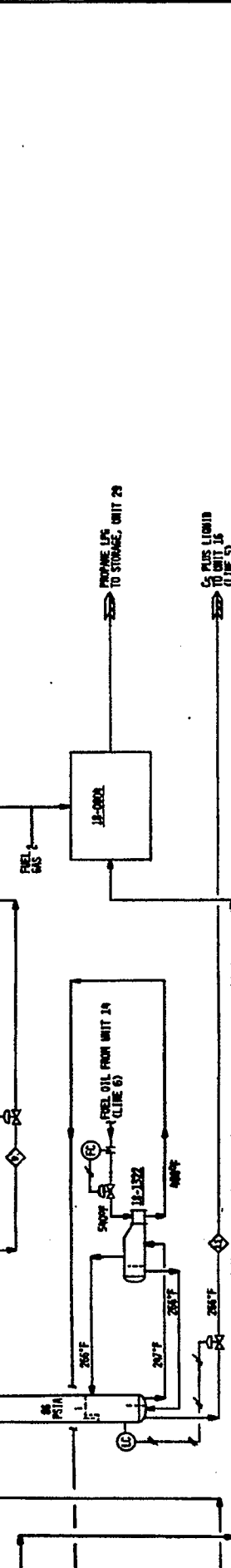
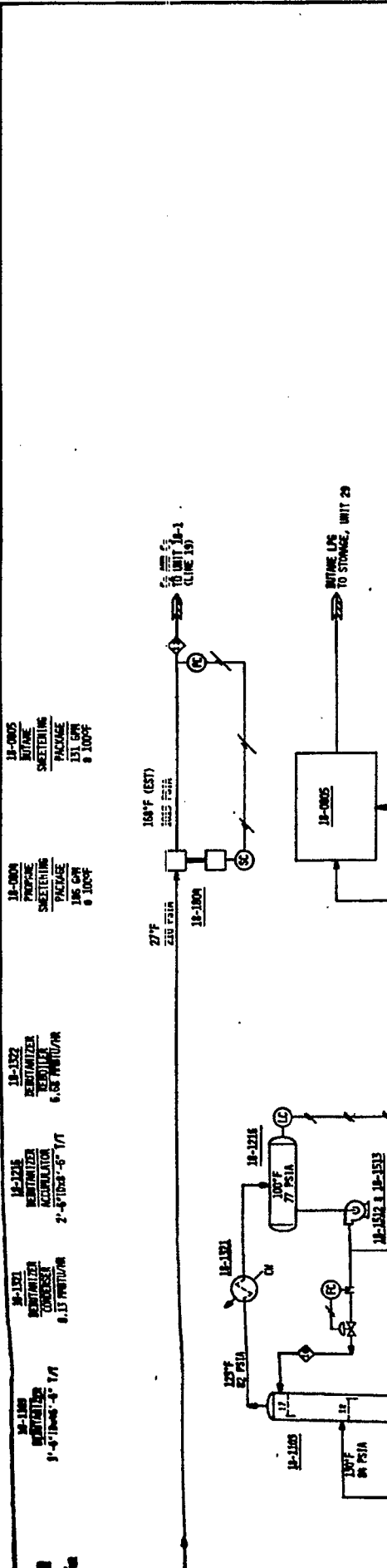
18-1322 & 18-1323
IDENTIFIER
OVERHEAD PUMP
220 GPM @ 27 PSI ΔP

18-1320 & 18-1321
IDENTIFIER
OVERHEAD PUMP & SPARE
550 GPM @ 26 PSI ΔP

18-1320 & 18-1321
IDENTIFIER
OVERHEAD PUMP & SPARE
260 GPM @ 26 PSI ΔP

COMP	CEN	MELT/HR	TOTAL MELT/HR	HP	HP/ALL
18-1322	100.75	100.75	100.75	11.007	11.007
18-1323	100.75	100.75	100.75	11.007	11.007
18-1324	100.75	100.75	100.75	11.007	11.007
18-1325	100.75	100.75	100.75	11.007	11.007
18-1326	100.75	100.75	100.75	11.007	11.007
18-1327	100.75	100.75	100.75	11.007	11.007
18-1328	100.75	100.75	100.75	11.007	11.007
18-1329	100.75	100.75	100.75	11.007	11.007
18-1330	100.75	100.75	100.75	11.007	11.007
18-1331	100.75	100.75	100.75	11.007	11.007
18-1332	100.75	100.75	100.75	11.007	11.007
18-1333	100.75	100.75	100.75	11.007	11.007
18-1334	100.75	100.75	100.75	11.007	11.007
18-1335	100.75	100.75	100.75	11.007	11.007
18-1336	100.75	100.75	100.75	11.007	11.007
18-1337	100.75	100.75	100.75	11.007	11.007
18-1338	100.75	100.75	100.75	11.007	11.007
18-1339	100.75	100.75	100.75	11.007	11.007
18-1340	100.75	100.75	100.75	11.007	11.007
18-1341	100.75	100.75	100.75	11.007	11.007
18-1342	100.75	100.75	100.75	11.007	11.007
18-1343	100.75	100.75	100.75	11.007	11.007

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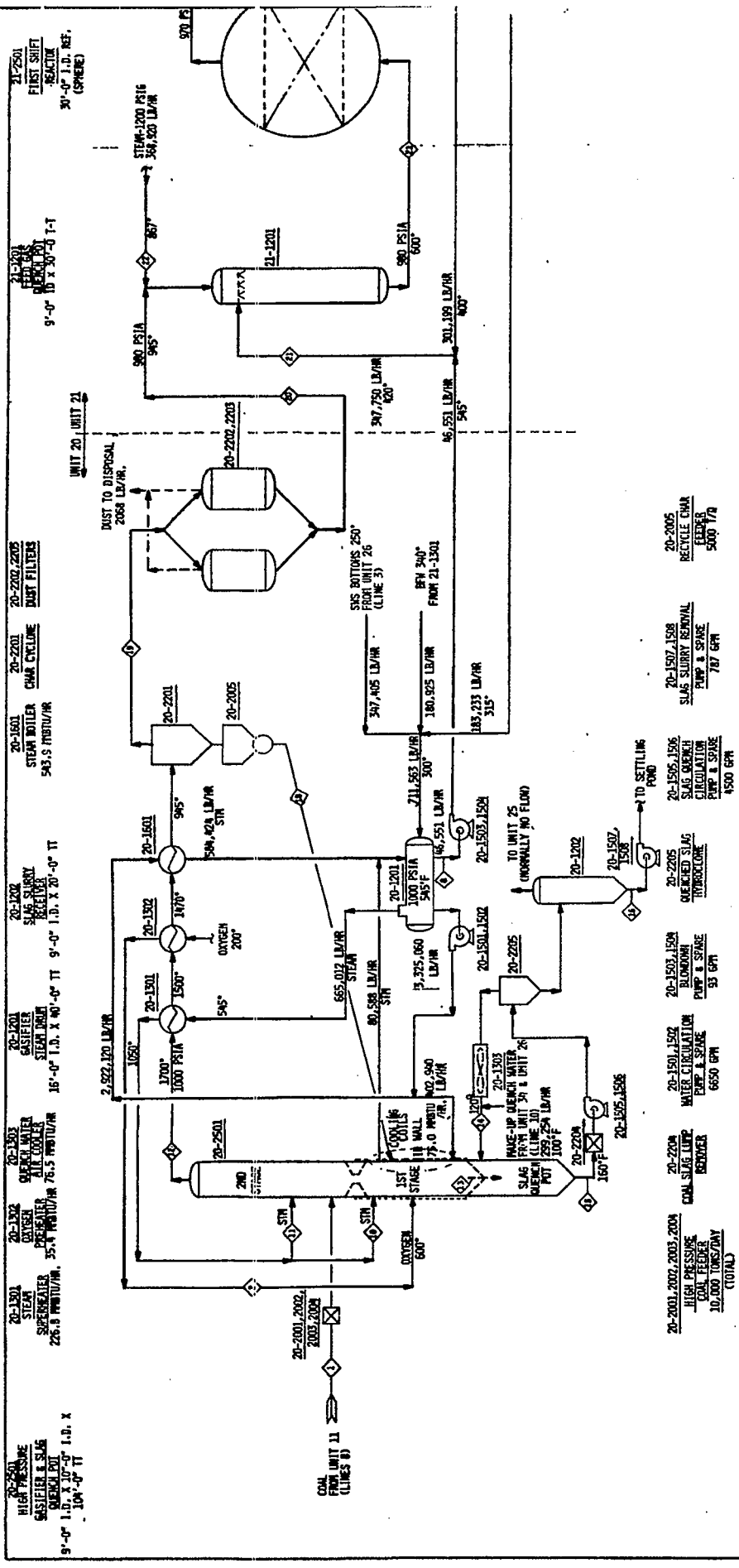


18-1000
186 GPM @ 100°F
SEPARATOR
15.53 TRS53

18-1312 & 18-1313
REBOILERS
OVERHEAD FLOW
220 GPM @ 27 PSIA ΔP

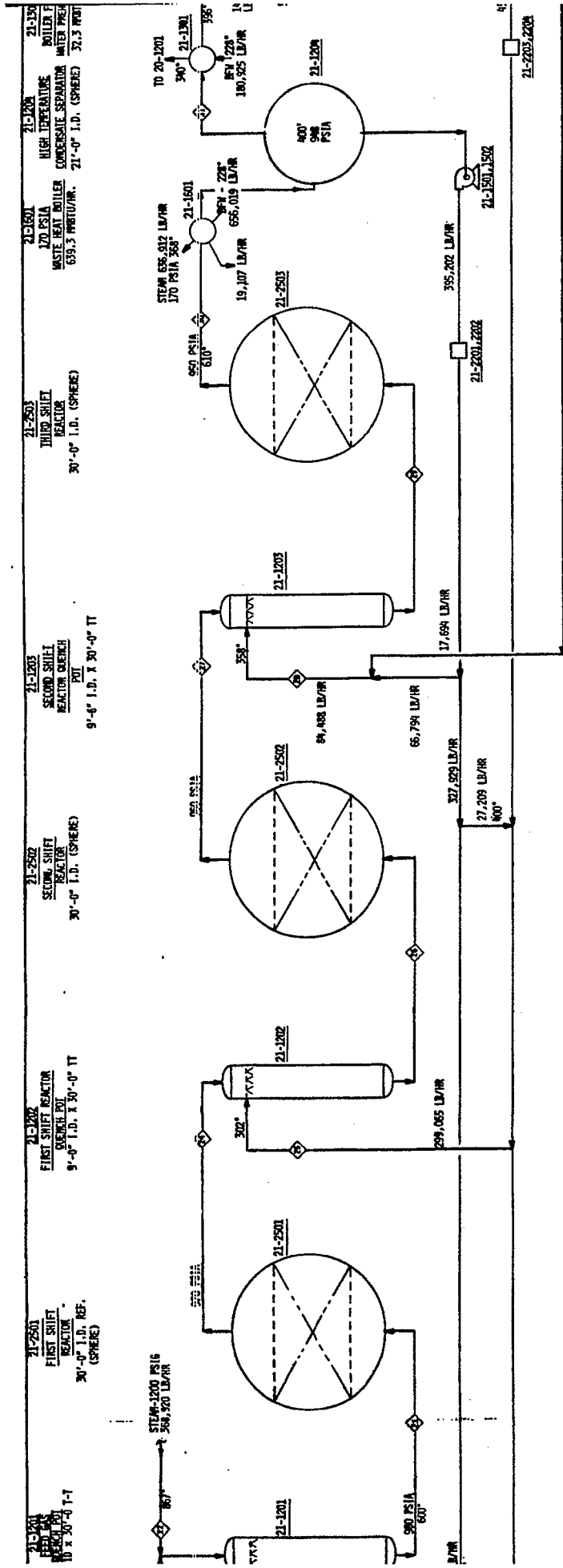
◇	27.20	115.45	1,021.51
◇	0.00	0.00	0.00
◇	27.20	115.45	1,021.51

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (CONA-FE)											
PROCESS FLOW DIAGRAM											
ETHTANE AND HEAVYER PURIFICATION - UNIT 28											
ISSUED FOR REPORT	DATE	BY	APP. BY	NO.	REV.	REV.	REV.	REV.	REV.	REV.	REV.
0											



UNIT	COMPONENT	STREAM NO.	STREAM NAME	SLAG	COAL	STEAM	WATER	SLURRY	DUST	OTHER
20-2001, 2002, 2003, 2004	HIGH PRESSURE GASIFIER & SLAG COOLER	20-2001	COAL FEED	---	11,507.41	---	---	---	---	---
		20-2002	COAL FEED	---	233.15	---	---	---	---	---
		20-2004	COAL FEED	---	---	---	---	---	---	---
20-2001, 2002, 2003, 2004	TOTAL HIGH PRESSURE COAL FEED	20-2001	COAL FEED	---	11,507.41	---	---	---	---	---
		20-2002	COAL FEED	---	233.15	---	---	---	---	---
20-1507, 1508	SLAG SLURRY REMOVAL PUMP & STAGE	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-1507, 1508	TOTAL SLAG SLURRY REMOVAL	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-2005	RECYCLE CWR FEEDER	20-2005	RECYCLE CWR	3,937.81	---	---	---	---	---	---
		20-2006	RECYCLE CWR	5,000.70	---	---	---	---	---	---
		20-2007	RECYCLE CWR	5,000.70	---	---	---	---	---	---
20-2005	TOTAL RECYCLE CWR FEEDER	20-2005	RECYCLE CWR	3,937.81	---	---	---	---	---	---
		20-2006	RECYCLE CWR	5,000.70	---	---	---	---	---	---
		20-2007	RECYCLE CWR	5,000.70	---	---	---	---	---	---
20-1507, 1508	SLAG SLURRY REMOVAL PUMP & STAGE	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-1507, 1508	TOTAL SLAG SLURRY REMOVAL	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-1507, 1508	TOTAL SLAG SLURRY REMOVAL	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-2005	TOTAL RECYCLE CWR FEEDER	20-2005	RECYCLE CWR	3,937.81	---	---	---	---	---	---
		20-2006	RECYCLE CWR	5,000.70	---	---	---	---	---	---
		20-2007	RECYCLE CWR	5,000.70	---	---	---	---	---	---
20-1507, 1508	TOTAL SLAG SLURRY REMOVAL	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-1507, 1508	TOTAL SLAG SLURRY REMOVAL	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-2005	TOTAL RECYCLE CWR FEEDER	20-2005	RECYCLE CWR	3,937.81	---	---	---	---	---	---
		20-2006	RECYCLE CWR	5,000.70	---	---	---	---	---	---
		20-2007	RECYCLE CWR	5,000.70	---	---	---	---	---	---
20-1507, 1508	TOTAL SLAG SLURRY REMOVAL	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-2005	TOTAL RECYCLE CWR FEEDER	20-2005	RECYCLE CWR	3,937.81	---	---	---	---	---	---
		20-2006	RECYCLE CWR	5,000.70	---	---	---	---	---	---
		20-2007	RECYCLE CWR	5,000.70	---	---	---	---	---	---
20-1507, 1508	TOTAL SLAG SLURRY REMOVAL	20-1507	SLAG	21,623.02	---	---	---	---	---	---
		20-1508	SLAG	24,479.17	---	---	---	---	---	---
		20-1509	SLAG	15,825.07	---	---	---	---	---	---
20-2005	TOTAL RECYCLE CWR FEEDER	20-2005	RECYCLE CWR	3,937.81	---	---	---	---	---	---
		20-2006	RECYCLE CWR	5,000.70	---	---	---	---	---	---
		20-2007	RECYCLE CWR	5,000.70	---	---	---	---	---	---

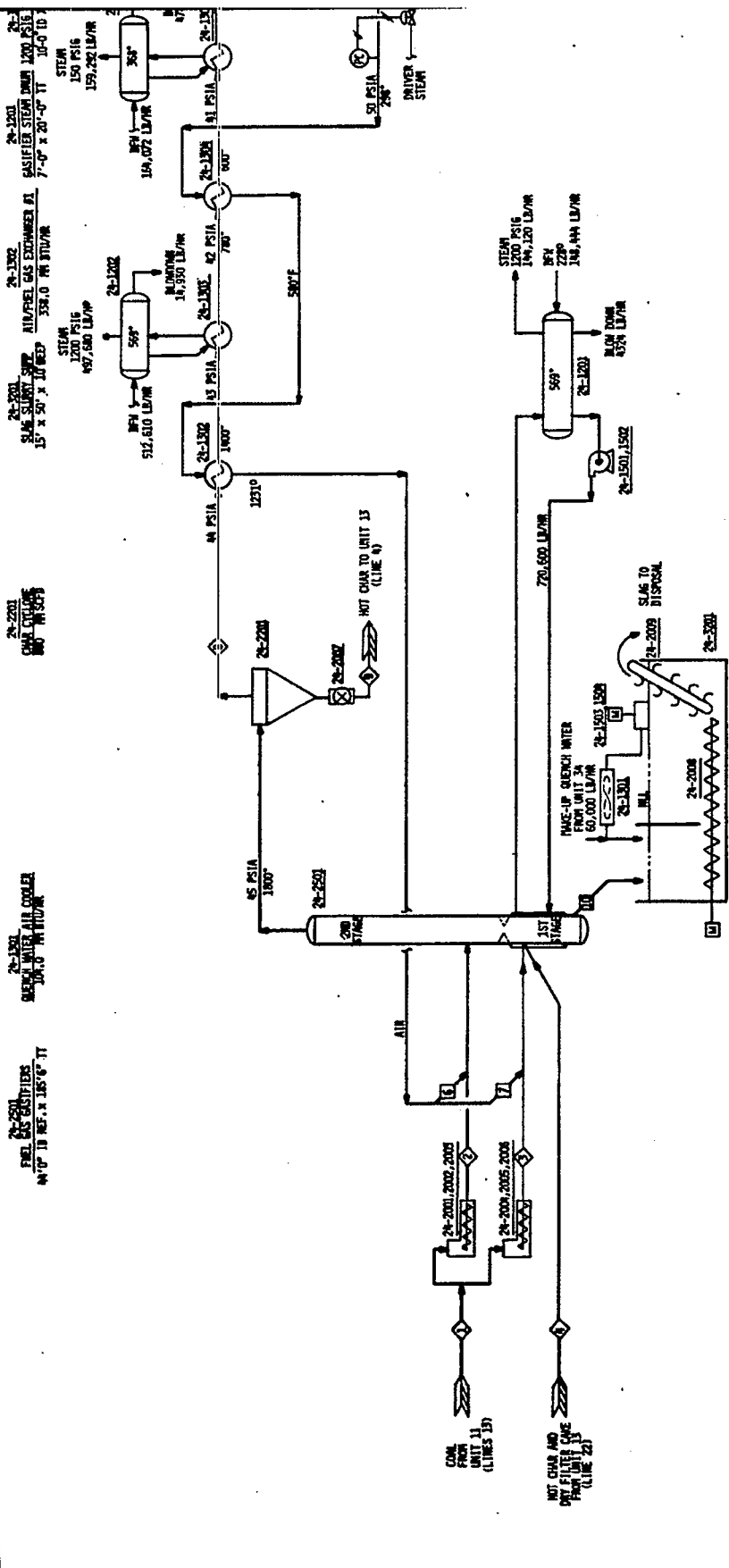
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ITEM	SLURRY TO DISPOSAL	RECYCLE CHAIR	GAZ TO FILTERS	CLEAN GAS	STREAM NO.	QUENCH WATER	1ST SHIFT FEED	1ST SHIFT PRODUCT	QUENCH WATER	2ND SHIFT FEED	2ND SHIFT PRODUCT	QUENCH WATER	3RD SHIFT FEED	3RD SHIFT PRODUCT	3ST. K.O. DRUM GAS	DRUM GAS	STEAM
1			21,422.02	21,422.02	02		39,316.37	39,316.37		39,316.37	42,424.48		42,424.48	44,209.89	44,209.89		
2			24,424.13	24,424.13	H2		4,424.13	4,424.13		4,424.13	4,424.13		4,424.13	1,000.00	1,000.00		
3			12,424.13	12,424.13	C2		20,318.79	20,318.79		20,318.79	34,816.87		34,816.87	34,816.87	34,816.87		
4			187.48	187.48	CO2		187.48	187.48		187.48	187.48		187.48	187.48	187.48		
5			18,285.95	18,285.95	H2O		9,142.98	9,142.98		9,142.98	9,142.98		9,142.98	9,142.98	9,142.98		
6			9,142.98	9,142.98	MCO		9,142.98	9,142.98		9,142.98	9,142.98		9,142.98	9,142.98	9,142.98		
7			9,142.98	9,142.98	CH4		9,142.98	9,142.98		9,142.98	9,142.98		9,142.98	9,142.98	9,142.98		
8			9,142.98	9,142.98	COAL (RAF)		9,142.98	9,142.98		9,142.98	9,142.98		9,142.98	9,142.98	9,142.98		
9			89,488.05	89,488.05	TOTAL MOLES/HR		129,346.03	129,346.03		129,346.03	141,244.66		141,244.66	146,634.27	146,634.27		
10			1,768,230	1,768,230	LB/HR		2,488,968	2,488,968		2,488,968	2,766,665		2,766,665	2,689,453	2,689,453		
11			32,818	32,818	MISCW		47,633	47,633		47,633	52,939		52,939	56,721	56,721		
12			27,443	27,443	WIP		16,033	16,033		16,033	16,033		16,033	16,033	16,033		
13			6,338	6,338	LB/GAL		19,433	19,433		19,433	19,433		19,433	19,433	19,433		

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28-2501 FUEL OIL HEATERS
44' UP TO REF. AT 135' 6" IT

28-2502 CHECK VALVE AIR COOLER
30' UP TO REF. AT 110' 0"

28-2503 CHAR FILTERS
60' UP TO REF. AT 105' 0"

28-2504 AIR PSEI GAS EXCHANGER #1
15' X 30' X 30' DEEP 338.0 MM BTU/HR

28-2505 AIR PSEI GAS EXCHANGER #2
7'-0" X 20'-0" X 11' 30'-0" ID

28-2506 CASSEIER STEAM DRYER 1200 PSIG
194,877 LB/HR

28-2507 CHALK CONVEYOR
208' X 10" @ 1.0 T/H

28-2508 CHALK SETTLER CONVEYOR
50' X 10" @ 1.0 T/H

28-2509 CHALK SETTLER ELEVATOR
WHITE LINE JUMP 3. SCHE

28-2510 CHALK CONVEYOR
220' X 10" @ 1.0 T/H

28-2511 CHALK CONVEYOR
220' X 10" @ 1.0 T/H

28-2512 CHALK CONVEYOR
220' X 10" @ 1.0 T/H

28-2513 CHALK CONVEYOR
220' X 10" @ 1.0 T/H

28-2514 CHALK CONVEYOR
220' X 10" @ 1.0 T/H

28-2515 CHALK CONVEYOR
220' X 10" @ 1.0 T/H

28-2516 CHALK CONVEYOR
220' X 10" @ 1.0 T/H

STEAM ADDITION POINTS:

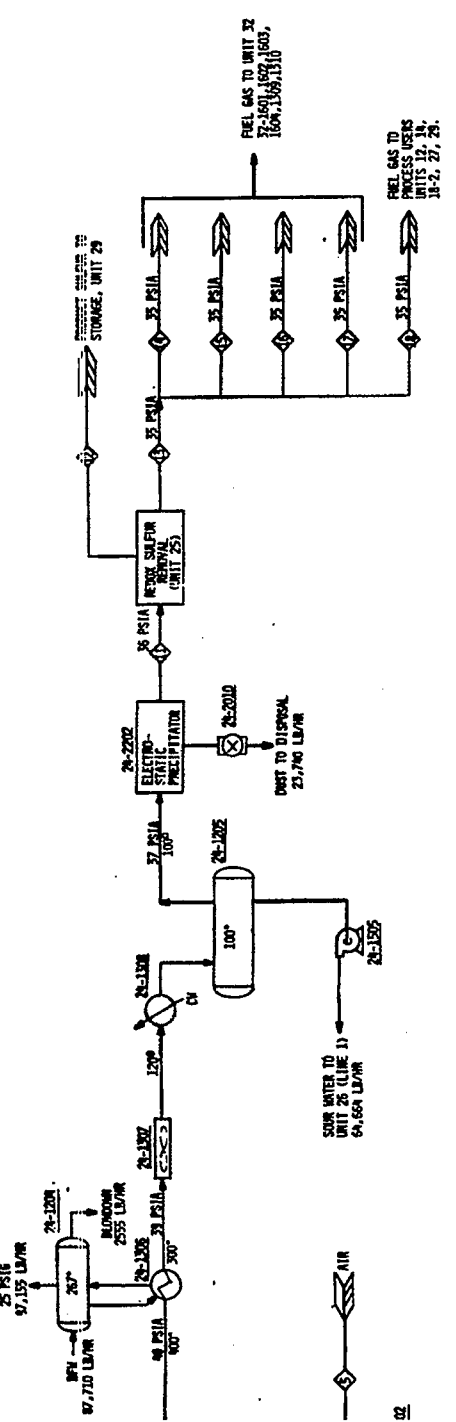
- 28-2501: 65 PSIA, 1800°F
- 28-2502: 45 PSIA, 1800°F
- 28-2503: 45 PSIA, 1800°F
- 28-2504: 45 PSIA, 1800°F
- 28-2505: 45 PSIA, 1800°F
- 28-2506: 45 PSIA, 1800°F
- 28-2507: 45 PSIA, 1800°F
- 28-2508: 45 PSIA, 1800°F
- 28-2509: 45 PSIA, 1800°F
- 28-2510: 45 PSIA, 1800°F
- 28-2511: 45 PSIA, 1800°F
- 28-2512: 45 PSIA, 1800°F
- 28-2513: 45 PSIA, 1800°F
- 28-2514: 45 PSIA, 1800°F
- 28-2515: 45 PSIA, 1800°F
- 28-2516: 45 PSIA, 1800°F

STEAM NO.	STEAM LINE	STEAM PRESS	STEAM TEMP	STEAM FLOW	STEAM QUALITY	STEAM ENTHALPY	STEAM ENTALPY
1	28-2501	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
2	28-2502	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
3	28-2503	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
4	28-2504	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
5	28-2505	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
6	28-2506	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
7	28-2507	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
8	28-2508	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
9	28-2509	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
10	28-2510	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
11	28-2511	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
12	28-2512	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
13	28-2513	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
14	28-2514	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
15	28-2515	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00
16	28-2516	45 PSIA	1800°F	13,690.37	0.811	1,800.00	11,880.00

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24-1306 AIR/FUEL GAS EXCHANGER #1 137.0 MM BTU/HR STEAM 25 PSIA 97.155 LB/HR
 24-1307 AIR/FUEL GAS EXCHANGER #2 137.0 MM BTU/HR STEAM 25 PSIA 97.155 LB/HR
 24-1308 STEAM GENERATOR #1 64" TO X 40'-0" TT 1800 MM BTU/HR
 24-1309 STEAM GENERATOR #2 64" TO X 40'-0" TT 1800 MM BTU/HR
 24-1310 STEAM GENERATOR #3 5'-0" TO X 40'-0" TT 830 MM BTU/HR
 24-1311 STEAM GENERATOR #4 5'-0" TO X 40'-0" TT 830 MM BTU/HR
 24-1312 FUEL GAS AIR COOLER 176.3 MM BTU/HR
 24-1313 FUEL GAS WATER COOLER 75'-0" TO X 50'-0" TT
 24-1314 CONDENSATE DRUM 25'-0" TO X 50'-0" TT
 24-2202 ELECTRO-STATIC PRECIPITATOR
 24-2500 REFINER SALFIR REFINER (UNIT 25)
 24-2501 STORAGE, UNIT 29



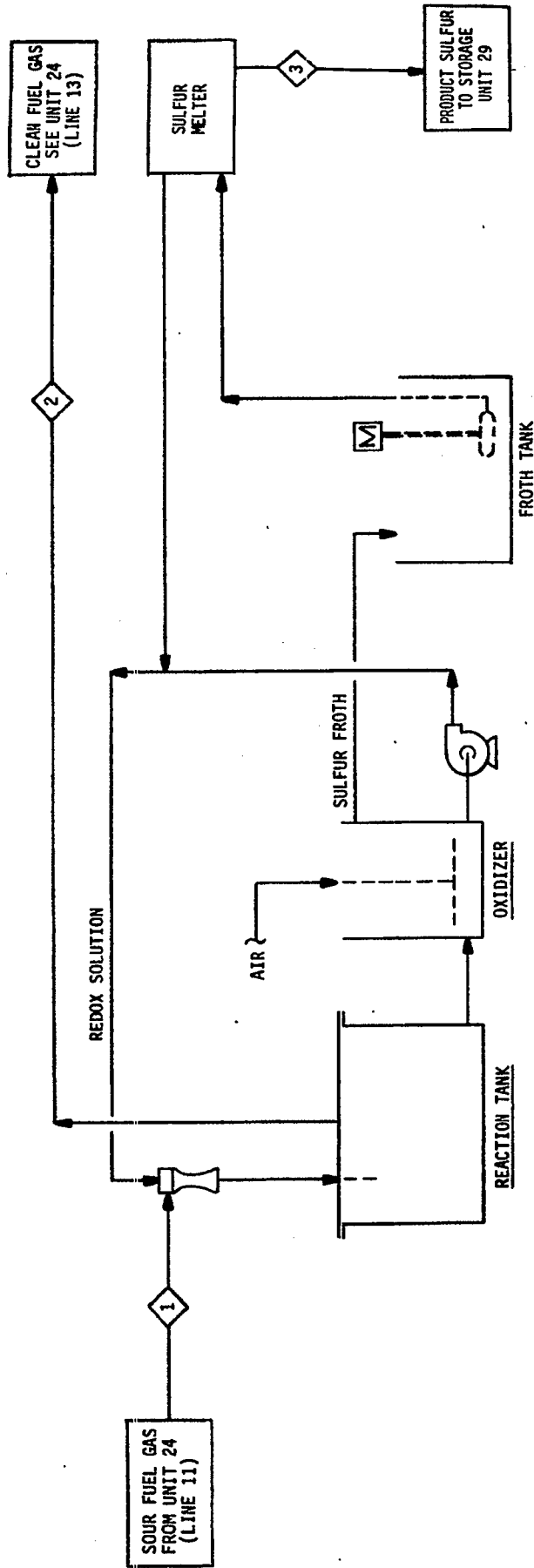
24-2010
 PREL. CONDENSER
 11.0 MM BTU/HR

24-1305
 CONDENSATE PUMP
 150 GPM

THE OILY RISK PROGRAM		DATE	BY	REVISION
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ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (ERDA-PR)
 OILY RISK PLANT
 PROCESS FLOW DIAGRAM
 FUEL GAS DISTRIBUTION-UNIT 24

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STREAM	1	2	3
GASES, MOLES/HR			
H ₂	13,688	13,688	-
N ₂	43,678	43,678	-
H ₂ S	964	(1 ppm)	-
H ₂ O	2,259	2,259	-
CO ₂	3,021	2,021	-
CO	25,390	25,390	-
TOTAL, MOLES/HR	88,000	87,036	-
TOTAL, LB/HR	2,124,978	2,092,121	-
LIQUID SULFUR, LB/HR	-	-	30,914

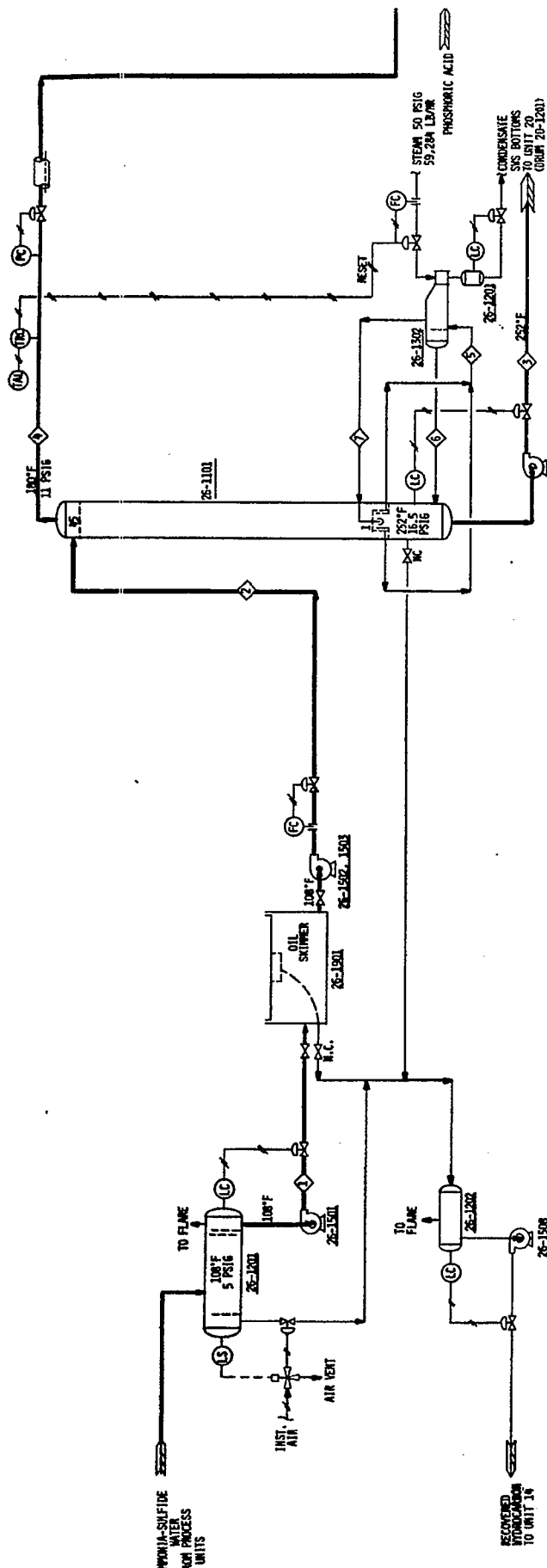
UNIT CAPACITY 349 LT/D

NOTE: THIS PROCESS ILLUSTRATED IS ONE OF SEVERAL PROPRIETARY PROCESSES AVAILABLE FOR THE PURPOSE INTENDED.

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (ERDA-FE)			
OIL/GAS PLANT			
PROCESS FLOW DIAGRAM			
FUEL GAS SULFUR REMOVAL - UNIT 25			
REV. NO.	DATE	BY	REVISION
0	8/24/64	J.C.	ISSUED FOR REPORT
CUST. APPR.	DATE	BY	REVISION
THE RALPH M. PARSONS COMPANY		JOB NO.	REV. NO.
PABADENA, CALIFORNIA		5435-2	R-25-FS-1

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26-1501
 8-0" I.D. X 303'-6" T-T
 3'-0" I.D. X 3'-0" T-T
 3'-0" I.D. X 3'-0" T-T
 3'-0" I.D. X 3'-0" T-T
 3'-0" I.D. X 3'-0" T-T
 3'-0" I.D. X 3'-0" T-T



26-1502
 STRIPPED FEED
 PUMP & SOURCE
 675 GPM EACH

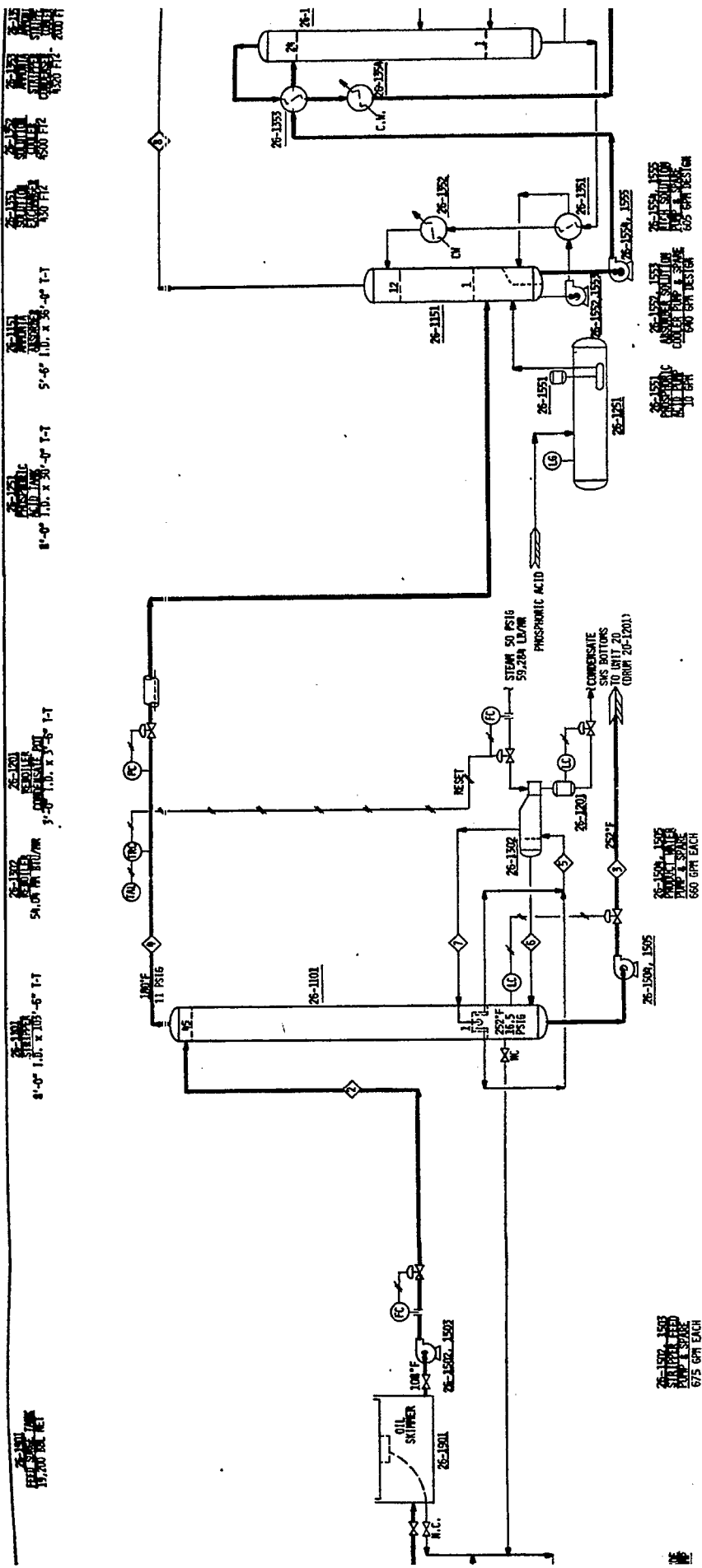
26-1501
 APPROX. SULFIDE
 WATER FEED PUMP
 675 GPM

26-1504
 REBIOLLER
 FEED PUMP
 600 GPM

26-1505
 REBIOLLER
 FEED PUMP
 600 GPM EACH

CONF.	STRIPPER LBS/HR	PRESENTED LBS/HR	STRIPPED LBS/HR	STRIPPED GAL/HR	REBIOLLER FEED LBS/HR	REBIOLLER LIQUID LBS/HR	REBIOLLER VAPOUR LBS/HR	ACID GAS LBS/HR	AMMONIA PRODUCT LBS/HR	WASTE WATER LBS/HR	STEAM LBS/HR
1	3188.06	3188.06	3188.06	8.27	8.27	8.27	2148.06	2148.06	2148.06	82394.02	94000.00
2	7221.29	7221.29	7221.29	0.83	0.83	0.83	7250.46	7250.46	7250.46	82394.02	94000.00
3	1303.79	1303.79	1303.79	1017.16	1017.16	1017.16	179.51	179.51	179.51	82394.02	94000.00
4	1078.82	1078.82	1078.82	1078.82	1078.82	1078.82	-	-	-	82394.02	94000.00
5	36820.19	36820.19	36820.19	363376.08	363376.08	363376.08	6.72	6.72	6.72	82394.02	94000.00
TOTAL	36937.08	36937.08	36937.08	347409.01	347409.01	347409.01	3072.58	3072.58	3072.58	82394.02	94000.00
R.M.T. P.T. C.P. T. Temperature, °F											

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COMP.	STRIPPER FEED LB/HR	STRIPPER WATER FEED LB/HR	STRIPPER GAS FEED LB/HR	REBOILER FEED LB/HR	REBOILER LIQUID LB/HR	REBOILER VAPOR LB/HR	ACID GAS LB/HR	AMMONIA PRODUCT LB/HR	WASTE WATER LB/HR	STEAM LB/HR
CO ₂ MOLES/HR	2168.08	0.27	2168.08	0.27	0.27	2168.08	2168.08	0.00	0.00	0.00
H ₂ O	7318.73	1077.16	7318.73	1077.16	1077.16	7318.73	7318.73	1077.16	1077.16	1077.16
ANALOG	3303.79	1077.16	3303.79	1077.16	1077.16	3303.79	3303.79	1077.16	1077.16	1077.16
CRUDE OIL	3303.79	1077.16	3303.79	1077.16	1077.16	3303.79	3303.79	1077.16	1077.16	1077.16
CONDENSATE	348235.90	0.72	348235.90	0.72	0.72	348235.90	348235.90	0.72	0.72	0.72
H ₂ O	348235.90	348235.90	348235.90	348235.90	348235.90	348235.90	348235.90	348235.90	348235.90	348235.90
TOTAL MOLES/HR	389307.00	348236.61	2168.08	404836.05	348236.08	97128.00	10972.56	7508.48	82994.02	94009.00
GM Wt. % T	18.886	18.189	21.853	18.189	18.189	18.020	23.184	13.032	18.815	18.816
GM Wt. % T	0.212	0.212	0.212	0.212	0.212	0.212	0.212	0.212	0.212	0.212
Temperature, °F	108	282	180	282	282	282	180	100	403	408

26-1304, 1305
CONDENSERS
TYPE & SIZE
660 GPM EACH

26-1302, 1303
REBOILERS
TYPE & SIZE
675 GPM EACH

26-1351, 1352
PUMPS
TYPE & SIZE
600 GPM EACH

26-1353, 1354, 1355
PUMPS
TYPE & SIZE
600 GPM EACH

26-1356, 1357
PUMPS
TYPE & SIZE
600 GPM EACH

26-1358, 1359
PUMPS
TYPE & SIZE
600 GPM EACH

26-1360, 1361
PUMPS
TYPE & SIZE
600 GPM EACH

26-1362, 1363
PUMPS
TYPE & SIZE
600 GPM EACH

26-1364, 1365
PUMPS
TYPE & SIZE
600 GPM EACH

26-1101
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1102
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1103
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1104
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1105
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1106
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1107
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1108
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1109
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1110
DISTILLATION COLUMN
TYPE & SIZE
200 FT

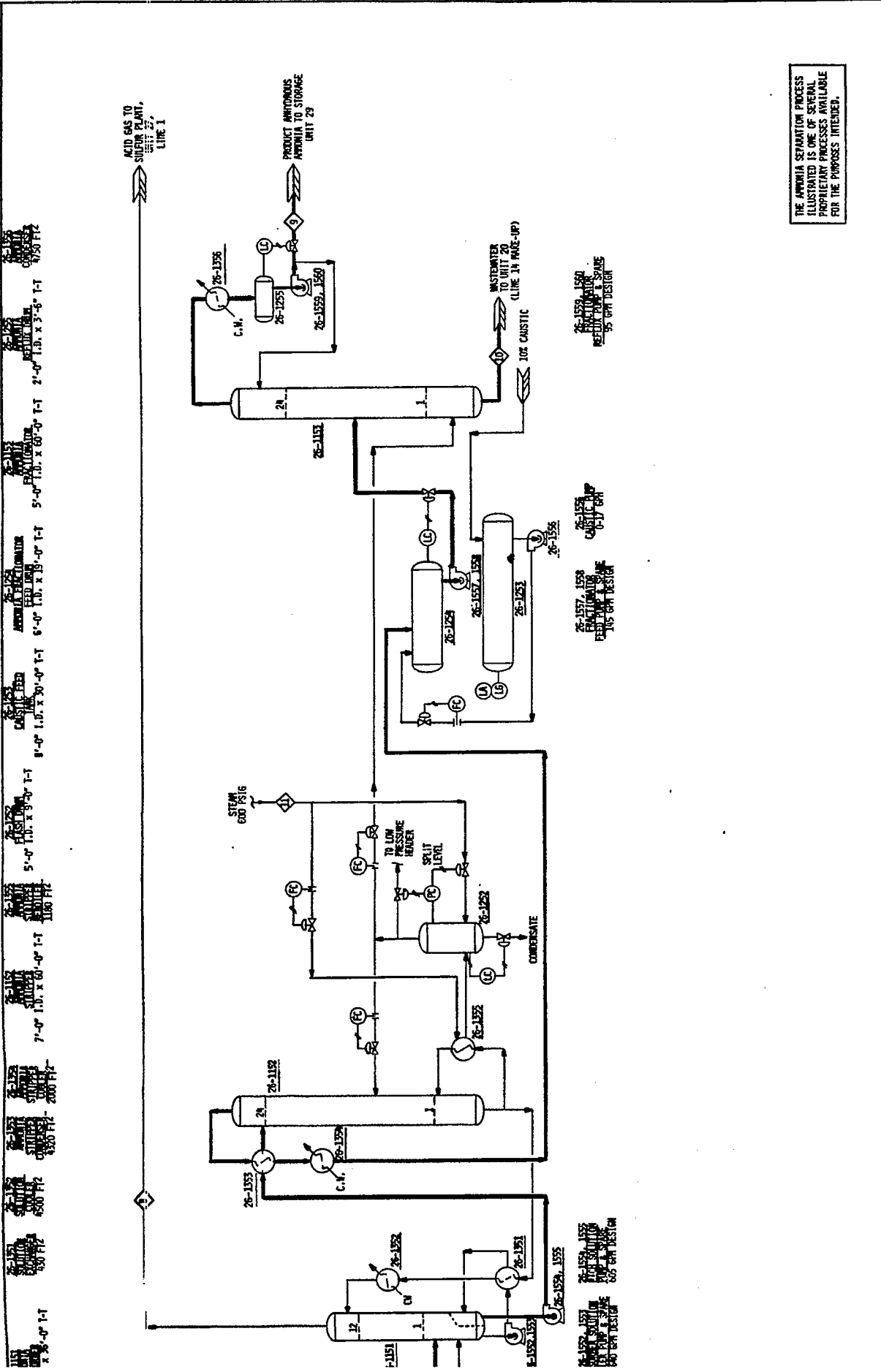
26-1111
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1112
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1113
DISTILLATION COLUMN
TYPE & SIZE
200 FT

26-1114
DISTILLATION COLUMN
TYPE & SIZE
200 FT

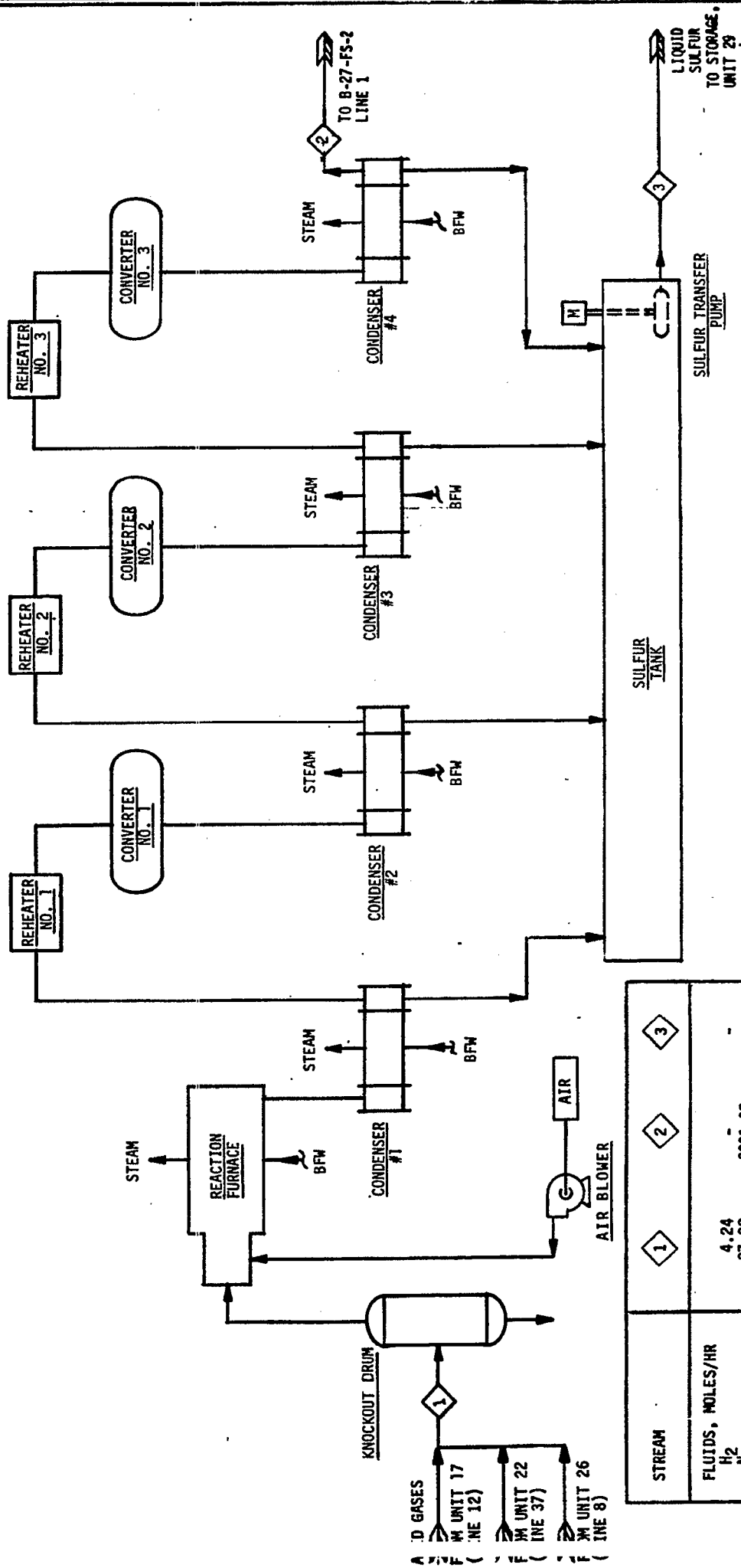
26-1115
DISTILLATION COLUMN
TYPE & SIZE
200 FT



THE AMMONIA SEPARATION PROCESS ILLUSTRATED IS ONE OF SEVERAL PROPRIETARY PROCESSES AVAILABLE FOR THE PURPOSES INTENDED.

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (ERDA-FED)									
OIL/GAS PLANT									
PROCESS FLOW DIAGRAM									
AMMONIA SULFIDE WATER TREATING AND AMMONIA SEPARATION-UNIT 26									
THE RALPH M. PARSONS COMPANY									
PASADENA, CALIFORNIA									
NO. OF SHEETS		DATE		ISSUED FOR REPORT		BY		REV.	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	
10		1967		26-1553		26-1553		26-1553	

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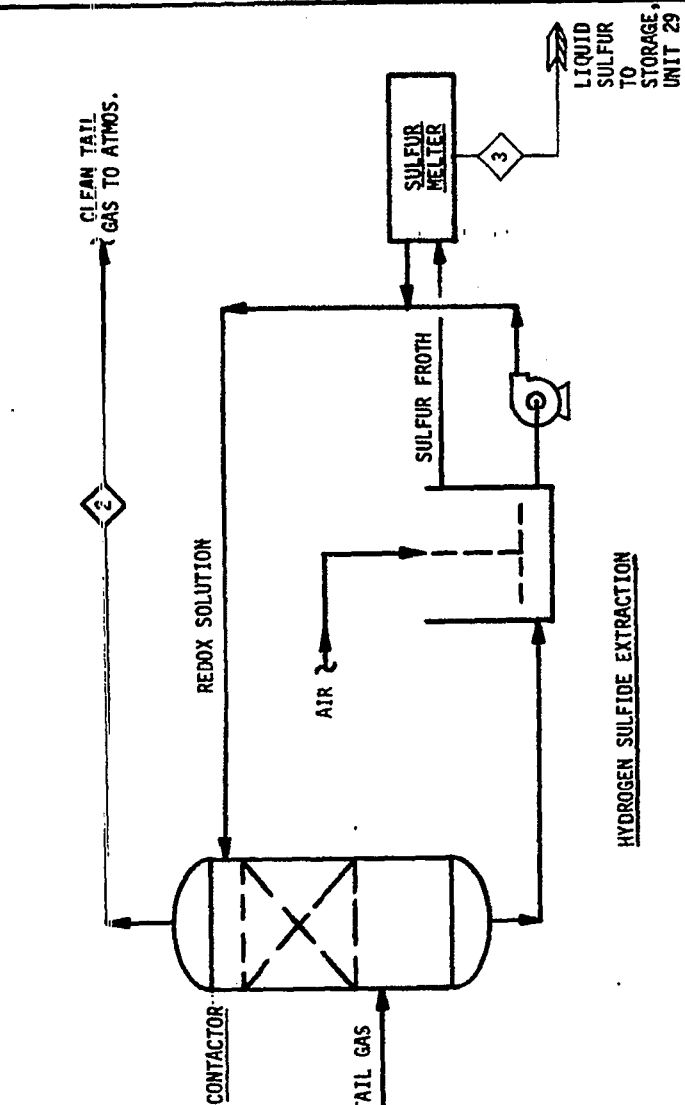
STREAM	1	2	3
FLUIDS, MOLES/HR			
H ₂	4.24	3991.38	-
N ₂	37.38	-	-
CO	0.17	2567.71	-
CO ₂	2563.71	-	-
NH ₃	5.29	74.00	-
H ₂ S	2236.90	37.00	-
SO ₂	-	-	-
Hydrocarbons	3.96	2601.48	-
H ₂ O	300.51	-	-
TOTAL, MOLES/HR	5152.16	9271.57	-
TOTAL, LB/HR	195,856	276,588	-
SOLIDS, LB/HR	-	-	68,169
SULFUR	-	-	68,169

REV. NO.	DATE	BY	REVISION	ISSUED FOR REPORT	CHKD	APPD	DATE	JOB NO.	DWR. NO.
1	1/27/54	WFE		1/27/54				5435-2	B-27-FS-1

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION
 OIL/GAS PLANT
 PROCESS FLOW DIAGRAM
 SULFUR RECOVERY (CLAUS UNIT) - UNIT 27

THE RALPH M. PARSONS COMPANY
 PASADENA, CALIFORNIA

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HYDROGEN SULFIDE EXTRACTION

HYDROGENATION SECTION

NOTE: THIS PROCESS ILLUSTRATED IS ONE OF SEVERAL PROPRIETARY PROCESSES AVAILABLE FOR THE PURPOSE INTENDED.

STREAM	1	2	3
FLUIDS, MOLES/HR			
N ₂	3991.38	4661.38	-
Cl ₂	2567.71	2726.71	-
H ₂ S	74.00	(1 ppm)	-
SO ₂	37.00	-	-
H ₂ O	2601.48	438.04	-
TOTAL, MOLES/HR	9271.57	7826.13	-
TOTAL, LB/HR	276,588	258,487	-
SOLIDS, LB/HR	-	-	-
SULFUR	-	-	3559

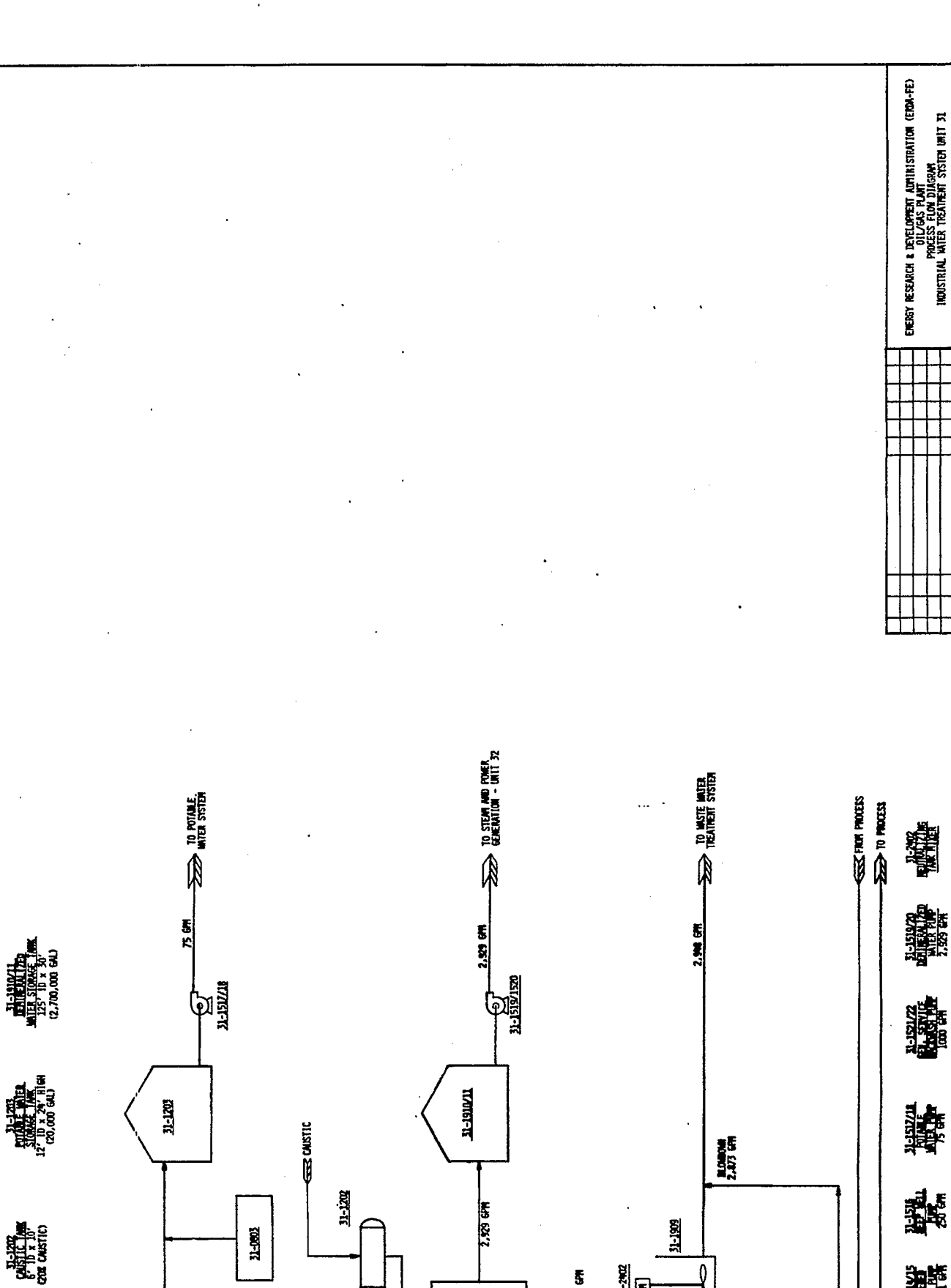
REV.	DATE	BY	REVISION	ISSUED FOR REPORT	DATE	BY	REVISION	DATE	BY	REVISION
1				ISSUED FOR REPORT	8/27/52	RR	1/1			

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (ERDA-FE) OIL/GAS PLANT PROCESS FLOW DIAGRAM SULFUR RECOVERY (TAIL GAS UNIT)- UNIT 27	JOB NO. 5435-2	DWG. NO. B-27-FS-2	REV. 1
THE RALPH M. PARSONS COMPANY PASADENA, CALIFORNIA			

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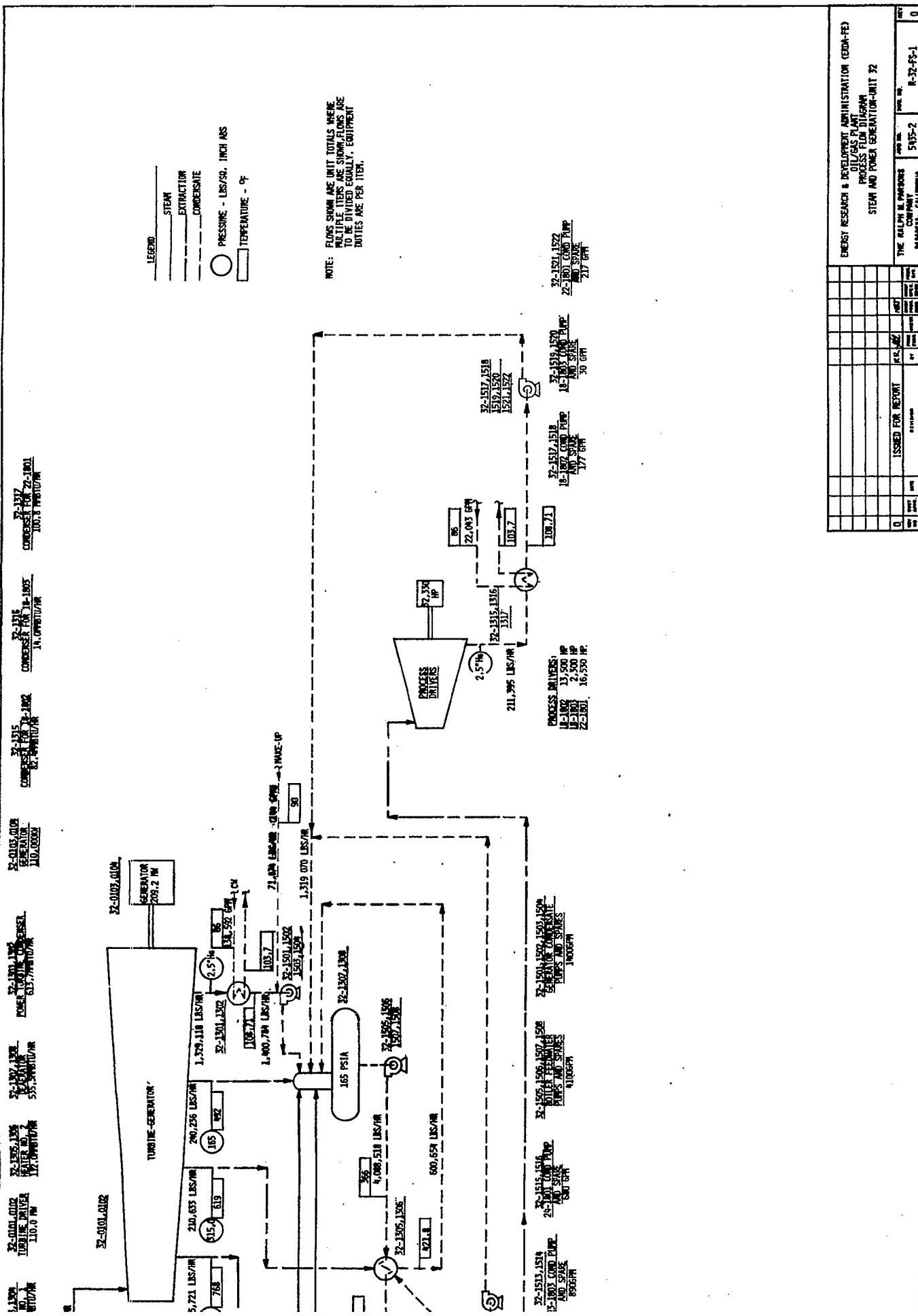
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REV	DATE	BY	DESCRIPTION	ISSUED FOR REPORT	NO. OF SHEETS	TOTAL NO. OF SHEETS	NO. OF PAGES	NO. OF FIGURES	NO. OF TABLES	NO. OF APPENDICES	NO. OF REFERENCES	NO. OF NOTES	NO. OF FOOTNOTES	NO. OF GLOSSARIES	NO. OF INDEXES	NO. OF BIBLIOGRAPHIES	NO. OF OTHERS	
0			ISSUED FOR REPORT															

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (ERDA-FED)
 OIL/GAS PLANT
 PROCESS FOR DIAGNOSTIC
 INDUSTRIAL WATER TREATMENT SYSTEM UNIT 31
 THE RAJAH K. RAMOS
 5435-2
 PASADENA, CALIFORNIA

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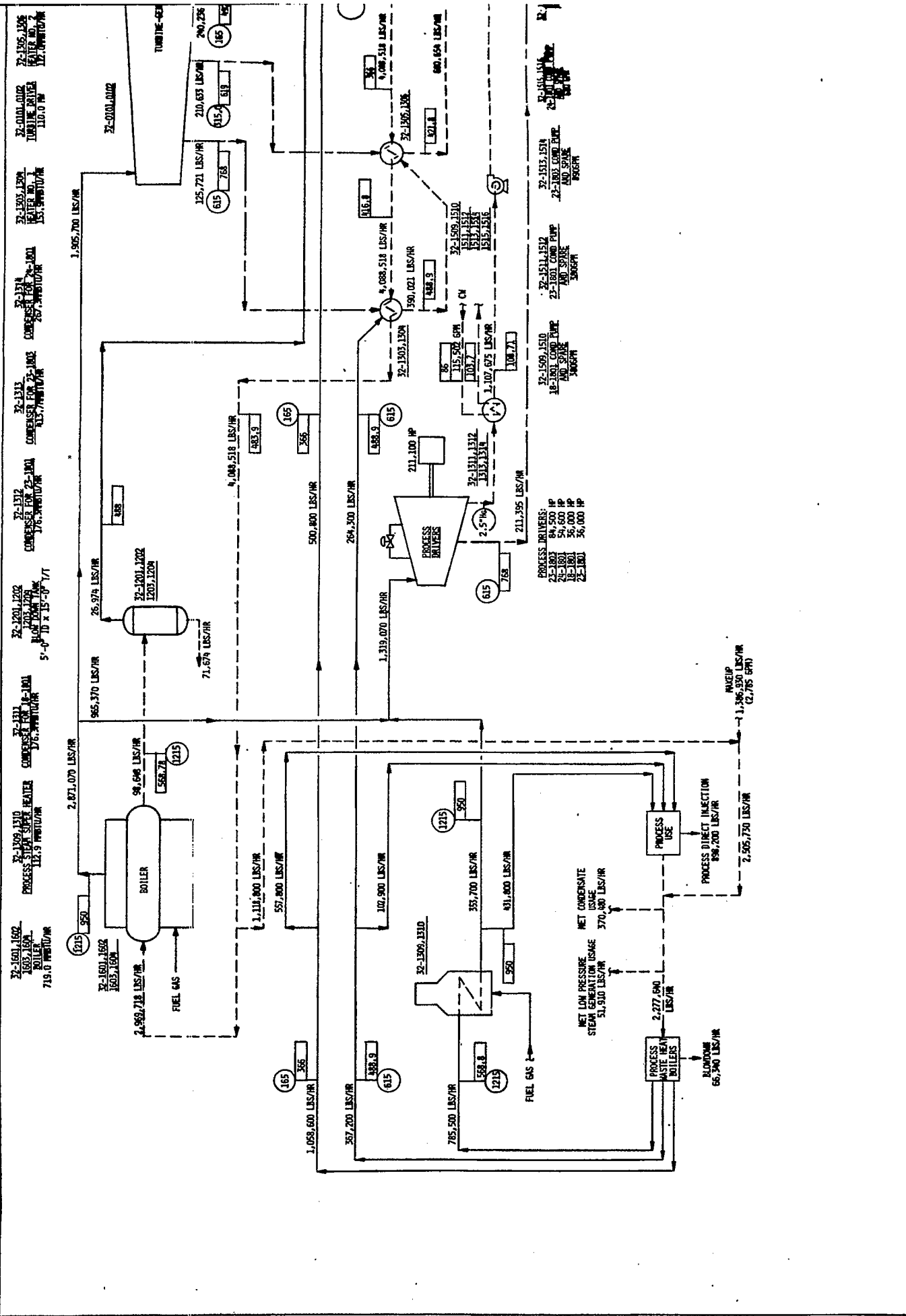
- 22-0101.0102 TURBINE DRIVER 110.0 MW
- 22-0102.0102 GENERATOR 209.2 MW
- 22-1301.1301 CONDENSATE PUMP 100.8 MW
- 22-1302.1302 CONDENSATE PUMP 100.8 MW
- 22-1303.1303 CONDENSATE PUMP 100.8 MW
- 22-1304.1304 CONDENSATE PUMP 100.8 MW
- 22-1305.1305 CONDENSATE PUMP 100.8 MW
- 22-1306.1306 CONDENSATE PUMP 100.8 MW
- 22-1307.1307 CONDENSATE PUMP 100.8 MW
- 22-1308.1308 CONDENSATE PUMP 100.8 MW
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- 22-1369.1369 CONDENSATE PUMP 100.8 MW
- 22-1370.1370 CONDENSATE PUMP 100.8 MW
- 22-1371.1371 CONDENSATE PUMP 100.8 MW
- 22-1372.1372 CONDENSATE PUMP 100.8 MW
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- 22-1397.1397 CONDENSATE PUMP 100.8 MW
- 22-1398.1398 CONDENSATE PUMP 100.8 MW
- 22-1399.1399 CONDENSATE PUMP 100.8 MW
- 22-1400.1400 CONDENSATE PUMP 100.8 MW

REV	DATE	BY	CHKD	DESCRIPTION
0				ISSUED FOR REPORT
1				REVISED
2				REVISED
3				REVISED
4				REVISED
5				REVISED
6				REVISED
7				REVISED
8				REVISED
9				REVISED
10				REVISED

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (EDRA-FE)
 OFFICE OF ENERGY RESEARCH & DEVELOPMENT
 PROCESS FLOW DIAGRAM
 STEAM AND POWER GENERATION-UNIT 32

THE FOLLOWING PERSONS
 5935-2
 PASADENA, CALIFORNIA

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32-1601-1602
1603-1604
1605-1606
719.0 TONS/HR

32-1309-1310
PROCESS STEAM SUPER HEATER
113.9 TONS/HR

32-1311
CONDENSER FOR #1-1001
176.7 TONS/HR

32-1201-1202
1203-1204
1205-1206
5'-0" ID x 15'-0" HT

32-1312
CONDENSER FOR #2-1001
176.7 TONS/HR

32-1313
CONDENSER FOR #2-1002
176.7 TONS/HR

32-1203-1204
CONDENSER FOR #2-1001
176.7 TONS/HR

32-1205-1206
CONDENSER FOR #2-1002
176.7 TONS/HR

32-0101-0102
TOWER
110.0 TONS/HR

32-1305-1306
CONDENSER FOR #2-1001
176.7 TONS/HR

32-1307-1308
CONDENSER FOR #2-1002
176.7 TONS/HR

32-1509-1510
84,500 HP

22-1803
84,500 HP

22-1801
84,500 HP

22-1802
84,500 HP

22-1804
36,000 HP

22-1805
36,000 HP

32-1511-1512
22-1801 COND PUMP
100.5 GPM
3866 HP

32-1513-1514
22-1802 COND PUMP
100.5 GPM
3866 HP

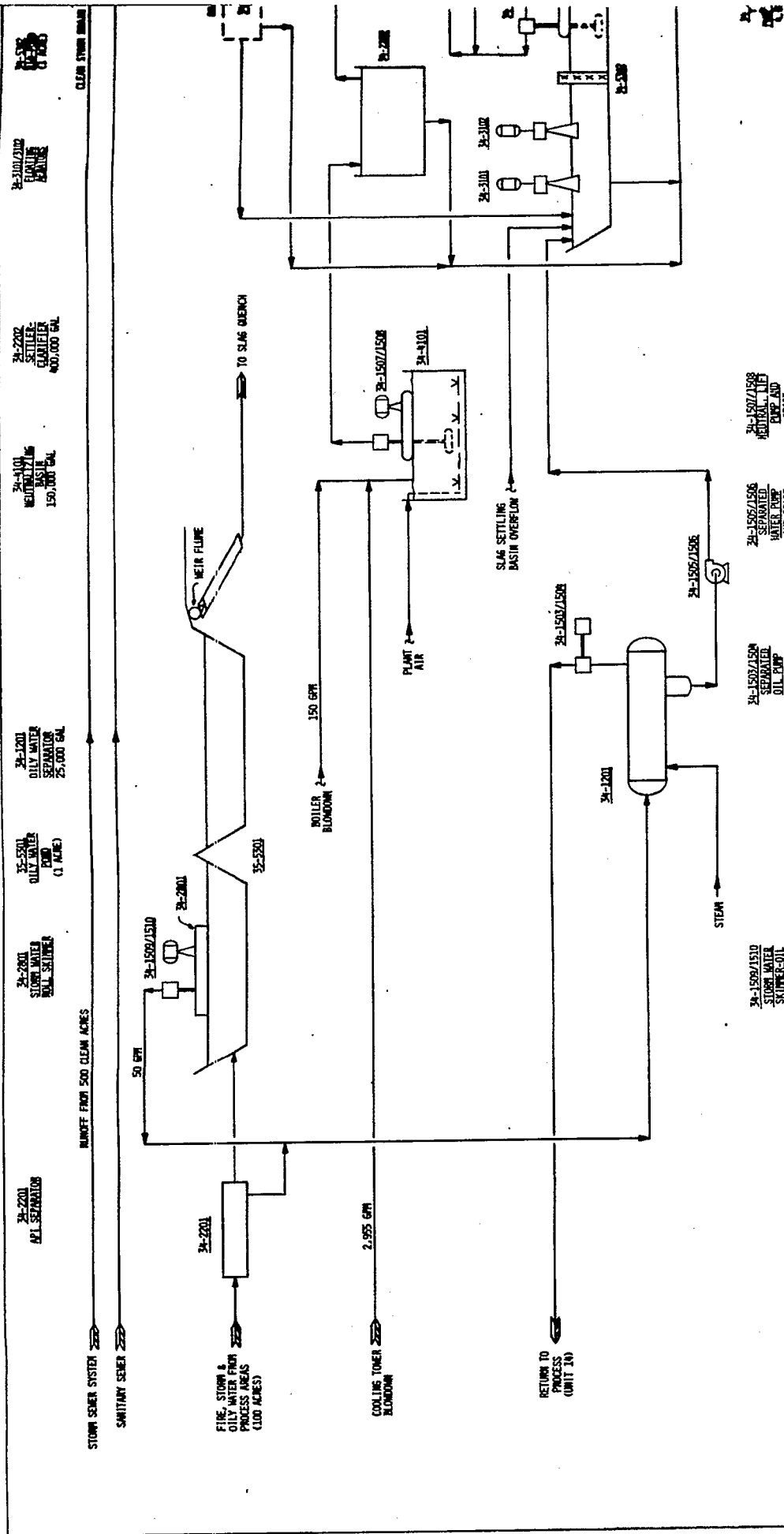
32-1515-1516
22-1803 COND PUMP
100.5 GPM
3866 HP

32-1517-1518
22-1804 COND PUMP
100.5 GPM
3866 HP

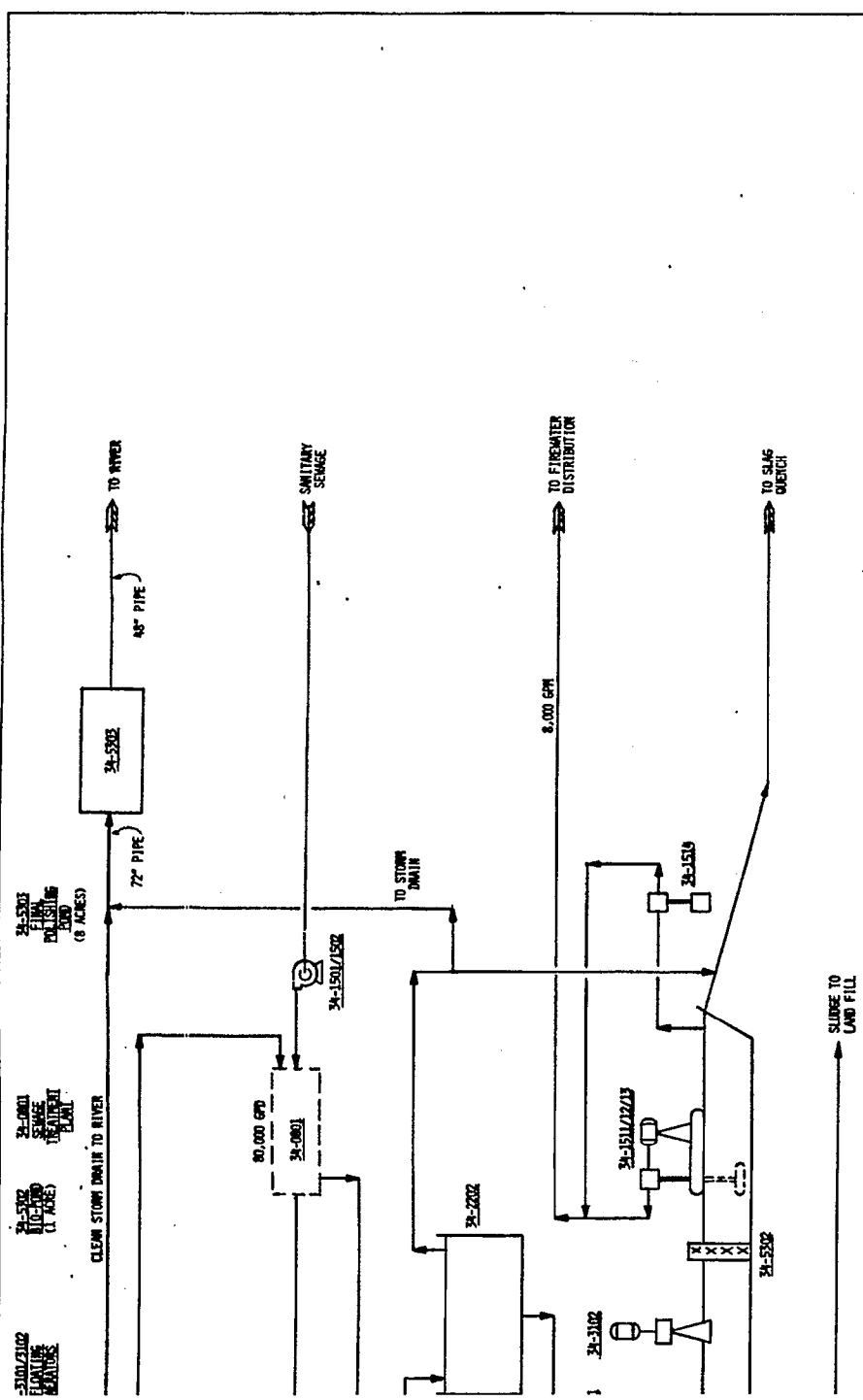
32-1519-1520
22-1805 COND PUMP
100.5 GPM
3866 HP

TAKEUP
1,396,950 LBS/HR
(2,785 GPM)

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NOTE: CAPACITY SHOWN ON EQUIPMENT IS MAXIMUM FOR DESIGN.

3A-1514
SOCKET
TYPE
100 GPM

3A-1507/502
SANITARY LINE
TYPE AND
SIZE
100 GPM

3A-1511/12/13
TYPE AND
SIZE
4,000 GPM EACH

SLUDGE TO
LAND FILL

REVISIONS		DATE	BY	CHKD	APP'D	DESCRIPTION
0						ISSUED FOR REPORT

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION (ERDA-FE)
OIL/GAS PLANT
PROCESS FLOW DIAGRAM
EFFLUENT WATER TREATMENT - UNIT 3A

THE OIL/GAS RESEARCH
COMPANY
PARAMARSA, CALIFORNIA

FORM NO. 5935-2
REV. 02
P-24-65-1
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