File Possible Permitting

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ROUTING SLIP

ROBERT BUTERA
SOUTHWEST DISTRICT

To

DATE: 12/4

cc To:

	PENSACOLA	**NORTHWEST DISTRICT**	
	Panama City	Northwest District Branch Office	
	Tallahassee	Northwest District Branch Office	
	Sopchoppy	Northwest District Satellite Office	
X	**TAMPA**	**SOUTHWEST DISTRICT**	
	Punta Gorda	Southwest District Branch Office	
	Bartow	Southwest District Satellite Office	
	ORLANDO	**CENTRAL DISTRICT**	
	Melbourne	Central District Satellite Office	
	JACKSONVILLE	**NORTHEAST DISTRICT**	
	Gainesville	Northeast District Branch Office	
	FORT MYERS	**SOUTH DISTRICT**	
	Marathon	South District Branch Office	
	WEST PALM BEACH	**SOUTHEAST DISTRICT**	
	Port St. Lucie	Southeast District Branch Office	

☐ Reply Optional Date Due _____ ☐ Reply Required Date Due: _____ ☐ Info Only

Comments:

Happy New Year

D.E.P.
JAN 06 2000
Southwest District Tampa

From: Jen Rae Tel.: SC 891-9967

08-18-93

Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

January 4, 2000

Mr. Melton McKown
Florida Department of Revenue
Tax Policy and Dispute Resolution
Post Office Box 7443
Tallahassee, Florida 32314-7443

Dear Mr. McKown:

Enclosed is a "Preliminary Examination Report" preliminarily certifying resource recovery equipment at the Pasco County Waste-to-Energy Facility. This report was prepared by the Department of Environmental Protection pursuant to Section 62-704.400, Florida Administrative Code, for your use when implementing Section 12A-1.001(23), Florida Administrative Code.

If you have any questions concerning this report or the Ogden Energy Group, Inc. application, please contact this office at (850) 488-0300.

Sincerely,

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

Enclosure

cc: Robert Butera
Peter Young, Ogden Energy Group, Inc.
File

D.E.P.
JAN 06 2000
Southwest District Tampa

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

PRELIMINARY EXAMINATION REPORT

On December 28, 1999, the Department of Environmental Protection received an Application for Preliminary Examination of Resource Recovery Equipment for the Pasco County Waste-to-Energy Facility. This application is for exemptions from the state sales tax for certain resource recovery equipment which will be used to recover energy or materials from solid waste at the facility. Pursuant to Section 403.715, Florida Statutes and Section 62-704.400, Florida Administrative Code, the Department hereby issues this report.

This preliminary examination report may be considered by the Department of Revenue, pursuant to Section 12A-1.001(23), Florida Administrative Code, when determining whether a temporary tax exemption shall apply to those items specified in this report as possible resource recovery equipment.

The Department's preliminary designations of resource recovery equipment in this report shall not preclude the Department from granting or denying certification following final examination of the same equipment, pursuant to Section 62-704.410, Florida Administrative Code.

After completing the preliminary examination, the Department has determined that all of the equipment listed in the applicant's equipment list (attached as Appendix A) may be resource recovery equipment as defined in Section 403.703(12), Florida Statutes, except for the following:

1. Item 34, Shower/eye wash (NH3 tank area)
2. Item 35, Shower/eye wash (injection area)

This report is issued this 4th day of January, 2000.

John M. Ruddell

John M. Ruddell, Director
Division of Waste Management

APPENDIX A

SECTION 6.0

December 7, 1999

LIST OF EQUIPMENT

Application for Preliminary Examination for Sales Tax Exemption
for the Pasco County Resource Recovery Facility SNCR and CEM Retrofit Project

Item No.	ITEM DESCRIPTION	No. of Pieces	Process Description Page Ref.	Drawing No.	Drawing Item No.
1	injection nozzles	6	Att. A, Section 3.2	99-7 P001,sh1-3	SNCR-LNC-1A,1B,2A,2B,3A,3B
2	wall boxes for injection nozzles	12	[support structure for injection nozzles]		
3	ammonia pumps	2	Att. A, Section 3.2	99-7 P001, SH 1	013D001 & 2
4	ammonia filter	2	[SNCR system]	99-7 P001,SH 1	SNCR-AQ-F1 & F2
6	vacuum breaker valve	1	[SNCR system]	99-7 P001,SH 1	SNCR-VBRKR-1
7	wye strainer	2	[SNCR system]	99-7 P001,SH 1	SNCR-AQ-ST 1 & 2
8	ammonia truck filling panel	1	[SNCR system]	99-7 P001,SH 1	013L004
9	sump pump	1	Att. A, Section 3.2	99-7 P001,SH 1	Dwg Note 11
10	purge air blowers	2	Att. A, Section 3.1	99-7 P002	013D013 & 014
11	relief valve	1	[SNCR system]	99-7 P001,SH 1	SNCR-PSV1 & 2
12	ammonia storage tank	1	Att. A, Section 3.2	99-7 P001,SH 1	AQ-TK-001
13	electrical devices for SNCR & CEMS	1 Lot	Att. A, Sec.3.2&4.	99-7 E601	[refer to dwg. for item nos.]
14	light fixtures at ammonia equipment	1 Lot	[SNCR system]		
15	sample line	1200 ft	Att. A, Sect. 4.5	PAS102800,sh1	
16	CEM DAS polling enclosure	1	Att. A, Sect. 4.5	PAS102800,sh1	
17	CEM fileserver enclosure	1	Att. A, Sect. 4.5	PAS102800,sh1	
18	Facility ethernet hub	1	Att. A, Sect. 4.5	PAS102800,sh1	
19	CEM-DAS alarm workstation	1	Att. A, Sect. 4.5	PAS102800,sh1	
20	system report printer	1	Att. A, Sect. 4.5	PAS102800,sh1	
21	economizer sample probes	3	Att. A, Sect. 4.5	PAS102800,sh1	
22	CEM equipment enclosure	1	Att. A, Sect. 4.5	PAS102800,sh1	
23	control valves for SNCR system:		[SNCR system]		
24	Ammonia Flow Control	3	[SNCR system]	99-7 P001,sh2&3	1,2&3NX-FCV-103
25	Blower Pressure Control	1	[SNCR system]	99-7 P002	NX-PRV-146
26	Carrier Water Press. Regul.	3	[SNCR system]	99-7 P001,SH 2	1,2&3NX-PRV-108
27	manual valves	1 Lot	[SNCR system]	99-7 P001,2,3	[as shown on PID]
28	dike & boiler NH3 leak detectors	3	Att. A, Section 3.1	99-7 P001,sh 1&3	NX-AIT-100,101,110
29	emergency stop stations	7	[SNCR system]	99-7 P001,sh1,2	NX-HS-119;1,2,3NX-HS-102A/B
30	auxiliary relay panel	1	[SNCR system]	99-7 E601	013L101
31	CEM operator console	1	[CEM system]	99-7 E601	013L012
32	SNCR tank area distribution panel	1	[CEM system]	99-7 E601	016E901
33	CEMS 3 phase transformers	3	[CEM system]	PAS102800,sh1	016E951,2,3
34	shower/eye wash (NH3 tank area)	2	Att. A, Section 3.2	99-7 P003	SNCR-SHWR-OA & OB
35	shower/eye wash (injection area)	4	[SNCR system]	99-7 P003	SNCR-SHWR-1A,2A,3A,3B
36	concrete/rebar for NH3 tank fndtn.	59 CY	[SNCR system]	99-7 C001	
37	concrete/rebar for new CEMS fndtn.	12 CY	[CEM system]	99-7 C001	
38	bollards	6	[SNCR&CEM sys.	99-7 C002	
39	concrete/rebar for new road paving	64 CY	[SNCR system]	99-7 C003	
40	imported/structural fill; sand & stone	93 CY	[SNCR&CEM sys.	99-7 S001	refer to "Foundation Excavation"
41	structural supports for NH3 equipme	4.1tons	[SNCR system]		
42	platforms for ammonia equip. access	[incl. above]		99-7 S002,3 & 4	
43	cable & conduit for NH3 equip.	1 Lot	[SNCR system]		
44	piping for ammonia equipment	2215 L	[SNCR system]	99-7 P001,2 & 3	[as shown on PID]
45	lance flex hoses	18	[SNCR system]	99-7 P001,SH 2&	SNCR-FLX-1/2/301,02&03A/B
46	pipe insulation	225 LF	[SNCR system]		
47	paint for steel & piping	1 Lot	[SNCR system]		
48	instruments for SNCR system:	72	[refer to 99-7 I324,	Instr. Calibration List, for quantities, dwg & tag Nos.]	
a	pressure gauges		[SNCR system]		
b	pressure switches		[SNCR system]		
c	level gauge		[SNCR system]		
d	level switchs		[SNCR system]		
e	flow transmitters		[SNCR system]		
f	rotameters		[SNCR system]		
g	flow switches		[SNCR system]		
h	temperature indicator & well		[SNCR system]		
i	orifice plates		[SNCR system]		

Refer to drawings listed in Section 5 and the following enclosed documents for further details:

Equipment List, SM 147-A1, Release 0, dated 8/23/99
Electrical Equipment List, Drawing No. 99-7 E601, Rev. 0, dated 11/04/99
Instrumentation Calibration Tag List, Drawing No. 99-7 I324-CAL, Rev. 0, dated 10/25/99

SECTION 7.0

ESTIMATED COST OF EQUIPMENT

The estimated cost for equipment, including construction materials, listed in Section 6.0 is $1,219,000.

File: Pasco WTE or Resource Rec. Fac.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ROBERT BUTERA
SOUTHWEST DISTRICT

NG SLIP

To: ______ DATE: [redacted]

			CC To:
	PENSACOLA	**NORTHWEST DISTRICT**	
	Panama City	Northwest District Branch Office	
	Tallahassee	Northwest District Branch Office	
	Sopchoppy	Northwest District Satellite Office	
X	**TAMPA**	**SOUTHWEST DISTRICT**	
	Punta Gorda	Southwest District Branch Office	
	Bartow	Southwest District Satellite Office	
	ORLANDO	**CENTRAL DISTRICT**	
	Melbourne	Central District Satellite Office	
	JACKSONVILLE	**NORTHEAST DISTRICT**	
	Gainesville	Northeast District Branch Office	
	FORT MYERS	**SOUTH DISTRICT**	
	Marathon	South District Branch Office	
	WEST PALM BEACH	**SOUTHEAST DISTRICT**	
	Port St. Lucie	Southeast District Branch Office	

☐ Reply Optional Date Due ______ ☐ Reply Required Date Due: ______ ☐ Info Only

Comments:

From: Jan Rae Clark Tel.: 488-0300

08-18-93

Department of
Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Jeb Bush
Governor

David B. Struhs
Secretary

December 28, 1999

Mr. L. Peter Young
Ogden Energy Group, Inc.
40 Lane Road
Fairfield, NJ 077007-2615

Dear Mr. Young:

We have determined that your Application for Preliminary Examination of resource recovery equipment at the Pasco County Waste-to-Energy Facility is complete.

We are completing the Preliminary Examination Report. You should receive a copy of this report within the next 30 days.

Sincerely,

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

cc: Robert Butera
Melton McKown
File

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

December 13, 1999

RECEIVED
DEC 1 . 1999
Department of Environmental Protection
BY SOUTHWEST DISTRICT

Mr. Peter Young, Vice President
Ogden Energy Group, Inc.
40 Lane Road.
Fairfield, NJ 07007-2615

Dear Mr. Young:

On December 13, 1999, we received your Application for Preliminary Examination of resource recovery equipment at the Pasco County Facility. We are proceeding to determine completeness of the application. Upon our determination of completeness, we will begin examination of the application.

Sincerely,

Jan Rae Clark

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

cc: Robert Butera
Melton McKown
File

KIM - FILE IN PARCEL LT. (FYI)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DISTRICT ROUTING SLIP

TO: Bob Butera DATE: 5/21/97

			CC To:
	PENSACOLA	**NORTHWEST DISTRICT**	
	Panama City	Northwest District Branch Office	
	Tallahassee	Northwest District Branch Office	
	Sopchoppy	Northwest District Satellite Office	
X	**TAMPA**	**SOUTHWEST DISTRICT**	
	Punta Gorda	Southwest District Branch Office	
	Bartow	Southwest District Satellite Office	
	ORLANDO	**CENTRAL DISTRICT**	
	Melbourne	Central District Satellite Office	
	JACKSONVILLE	**NORTHEAST DISTRICT**	
	Gainesville	Northeast District Branch Office	
	FORT MYERS	**SOUTH DISTRICT**	
	Marathon	South District Branch Office	
	WEST PALM BEACH	**SOUTHEAST DISTRICT**	
	Port St. Lucie	Southeast District Branch Office	

☐ Reply Optional Date Due ______ ☐ Reply Required Date Due: ______ ☒ Info Only

Comments:

RECEIVED
MAY 22 1997
Department of Environmental Protection
SOUTHWEST DISTRICT

From: JanRae Clark BY SC 291-9967 Tel.:

08-18-93

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

May 21, 1997

Mr. Melton McKown
Department of Revenue
Tax and Policy Dispute Resolution
Post Office Box 7443
Tallahassee, Florida 32314-7443

Dear Mr. McKown:

Enclosed is a "Final Examination Report" certifying resource recovery equipment at the Pasco County Leachate Treatment Facility This report was prepared by the Department of Environmental Protection pursuant to Section 403.715, Florida Statutes, and Sections 62-704.400 and .410, Florida Administrative Code, for your use when implementing Section 12A-1.001(23), Florida Administrative Code.

If you have any questions concerning this report or the Resources Conservation Company's application, please contact this office at 488-0300.

Sincerely,

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

Enclosure

cc: Bob Butera
Mike Spann
File

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

FINAL EXAMINATION
REPORT FOR THE CERTIFICATION OF
RESOURCE RECOVERY EQUIPMENT

APPLICANT: Resources Conservation Company

FACILITY: Pasco County Leachate Treatment Facility

ADDRESS: Pasco County Resource Recovery Plant
Hayes Road, Hudson, FL

On May 6, 1997, the Department of Environmental Protection staff performed an inspection of resource recovery equipment located at the above named facility owned by Pasco County. The inspection was based on the listing of eligible equipment (Appendix A) in Resource Conservation Company's application for Final Examination and Certification of Resource Recovery Equipment. Pursuant to Section 403.715, Florida Statutes, and Section 62-704.410, Florida Administrative Code, the Department hereby issues this report.

The Department of Environmental Protection certifies that all of the equipment listed in Appendix A is resource recovery equipment as defined in Section 403.703(12), Florida Statutes. If there are any questions concerning this report or the attachment, please contact Jan Rae Clark at (904) 488-0300.

This report is issued this 20th day of May, 1997.

John M. Ruddell

John M. Ruddell, Director
Division of Waste Management

APPENDIX A

P Form# 62-701.900(6)
Ap. for Prelim. Exam.& Final Exam
Form Title of Resource Recovery Equipment
Effective Date 12/23/96
DEP Application No. _____
(Filled in By DEP)

Listing of Major Equipment for Pasco County Leachate Treatment Facility
(Facility Name)

Item No.	Item Description	Number of Pieces	Process Description Page Reference	Drawing No.	Drawing Item No.	Equipment Cost
1	Sodium Sulfate Pump	1	A-6,A-7	M4-1,Sht 2	P-015,	4,712.00
2	Sodium Sulfate Tank Mixer	1	A-6,A-7	M4-1,Sht 2	MX-016	1,364.00
3	Sodium Sulfate Tank	1	A-6,A-7	M4-1,Sht 2	T-014	8,010.00
4	Scale Inhibitor System	1	A-6,A-7	M4-1,Sht 2	P-026	984.50
5	Acid System	1	A-6	M4-1,Sht 2	P-011	2,411.50
6	Feed Tank	1	A-6,A-7	M4-1,Sht 2	T-001	6,160.00
7	Feed Tank Mixer	1	A-6	M4-1,Sht 2	MX-002	1,289.00
8	Feed Pump	1	A-7	M4-1,Sht 2	P-003	2,819.00
9	Heat Exchanger	1	A-8	M4-1,Sht 3	HX-100	7,484.00
10	Distillate Pump	1	A-13	M4-1,Sht 3	P-111	2,475.00
11	Distillate Tank	1	A-12,A-13	M4-1,Sht 3	T-110	6,400.00
12	Rubber Expansion Joint	1	N/A	M4-1,Sht 4	XJ-03	1,334.00
13	Deaerator	1	A-8	M4-1,Sht 3	T-101	8,786.00
14	Evaporator	1	A-9,A-10	M4-1,Sht 4	E-120	272,804.84
15	Recirculation Pump	1	A-10,A-11	M4-1,Sht 4	P-121	12,257.00
16	Evaporator Recirc Ducts	1	A-10	M4-1,Sht 4	w/ P-121	43,230.00
17	Evap Vapor Ducts/Seal Leg	1	A-11	M4-1,Sht 5	E-130	21,600.00
18	Seed Tank	1	A-11	M4-1,Sht 4	T-151	8,062.00
19	Seed Tank Mixer	1	A-11	M4-1,Sht 4	MX-152	1,353.00
20	Seed Pump	1	A-11	M4-1,Sht 5	P-150	2,953.00
21	Vapor Compressor	1	A-11,A-12	M4-1,Sht 6	K-131	83,474.08
22	Spray Dryer Feed Tank	1	A-14	M4-1,Sht 6	T-300	24,815.00
23	Spray Dryer Feed Pump	1	A-14	M4-1,Sht 6	P-301	3,220.00
24	Spray Dryer Feed Tank Mixer	1	A-14	M4-1,Sht 6	MX-302	8,884.00
25	Spray Dryer Unit	1	A-14	M5-1,Sht 2	Niro PFD	497,222.00
26	Startup Boiler	1	--	M4-1,Sht 7	B-101	7,755.00
27	Vertical Sump Pump	2	--	--	--	9,920.00
28	Drain Sump Mixer	1	--	--	--	3,730.00
29	PLC Cabinet	1	N/A	M5-1,Sht 1	N/A	4,912.00
30	PLC	1	N/A	M5-1,Sht 1	N/A	42,660.60
31	Skids & Platforms	Lot	N/A	M4 shaded	N/A	164,520.00
32	MCC, 480V & 120V	2	N/A	M5-1,Sht 1	N/A	18,357.40
33	Transmitters & Flowmeters	Lot	N/A	All M4 shts	Various	29,722.86
34	Pressure Regulators	Lot	N/A	M4 shts	Various	2,701.02
35	Level Switches & Indicator	Lot	N/A	M4 shts	Various	5,717.00
36	Pressure & Temp Indicators	Lot	N/A	M4 shts	Various	3,803.00
37	Control Valves	Lot	N/A	M4 shts	Various	27,253.00
38	Lab Equipment	Lot	N/A	N/A	N/A	3,860.51

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Kim file

DISTRICT ROUTING SLIP

To: Bob Butera DATE: 4/18/97

CC To:

	PENSACOLA	**NORTHWEST DISTRICT**	
	Panama City	Northwest District Branch Office	
	Tallahassee	Northwest District Branch Office	
	Sopchoppy	Northwest District Satellite Office	
	TAMPA	**SOUTHWEST DISTRICT**	X
	Punta Gorda	Southwest District Branch Office	
	Bartow	Southwest District Satellite Office	
	ORLANDO	**CENTRAL DISTRICT**	
	Melbourne	Central District Satellite Office	
	JACKSONVILLE	**NORTHEAST DISTRICT**	
	Gainesville	Northeast District Branch Office	
	FORT MYERS	**SOUTH DISTRICT**	
	Marathon	South District Branch Office	
	WEST PALM BEACH	**SOUTHEAST DISTRICT**	
	Port St. Lucie	Southeast District Branch Office	

RECEIVED
APR 23 1997
Department of Environmental Protection
SOUTHWEST DISTRICT

☐ Reply Optional Date Due _____ ☐ Reply Required Date Due: _____ ☐ Info Only

Comments:

Bob,

Please substitute the attached equipment list for the one currently in the app.

From: Jan Rae Clark Tel.: SC 291-9967

08-18-93

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

April 18, 1997

Mr. Mike Spann
Project Manager
Resource Conservation Company
3006 Northrup Way
Bellevue, WA 98004-1407

Dear Mr. Spann:

We have determined that your Application for Final Examination and Certification of resource recovery equipment at the Pasco County Resource Recovery Facility is complete.

We will inspect the installed equipment at a mutually agreeable time within the next 30 days. Please advise me of a convenient time for this inspection.

Sincerely,

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

cc: Bob Butera
Melton McKown
File

IONICS

RCC Resources Conservation Company

3006 Northup Way
Bellevue, WA 98004-1407

Phone: 206 828-2400
Fax: 206 828-0526

A Division of Ionics, Incorporated

April 14, 1997
PAS-L229.DOC

Environmental Administrator
Solid Waste Section
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, MS 4565
Tallahassee, Florida 32399-2400

Attention: Jan Rae Clark

Dear Ms. Clark,

Enclosed please find four (4) copies of the Equipment List revised to include costs for items 13 "Deaerator" and 14 "Evaporator" as required. Please substitute and insert these revised lists into the (4) copies of our Application for Certification of Resource Recovery Equipment previously submitted to your department.

Please call if you have any questions. The full contract document was copied and transmitted last Friday under separate cover.

Very truly yours,

RESOURCES CONSERVATION COMPANY

Mike Spann
Project Manager

Form# 62-701.900(6)
Ap. for Prelim. Exam.& Final Exam
Form Title of Resource Recovery Equipment

Effective Date 12/23/96
DEP Application No.
(Filled in By DEP)

Listing of Major Equipment for Pasco County Leachate Treatment Facility
(Facility Name)

Item No.	Item Description	Number of Pieces	Process Description Page Reference	Drawing No.	Drawing Item No.	Equipment Cost
1	Sodium Sulfate Pump	1	A-6,A-7	M4-1,Sht 2	P-015,	4,712.00
2	Sodium Sulfate Tank Mixer	1	A-6,A-7	M4-1,Sht 2	MX-016	1,364.00
3	Sodium Sulfate Tank	1	A-6,A-7	M4-1,Sht 2	T-014	8,010.00
4	Scale Inhibitor System	1	A-6,A-7	M4-1,Sht 2	P-026	984.50
5	Acid System	1	A-6	M4-1,Sht 2	P-011	2,411.50
6	Feed Tank	1	A-6,A-7	M4-1,Sht 2	T-001	6,160.00
7	Feed Tank Mixer	1	A-6	M4-1,Sht 2	MX-002	1,289.00
8	Feed Pump	1	A-7	M4-1,Sht 2	P-003	2,819.00
9	Heat Exchanger	1	A-8	M4-1,Sht 3	HX-100	7,484.00
10	Distillate Pump	1	A-13	M4-1,Sht 3	P-111	2,475.00
11	Distillate Tank	1	A-12,A-13	M4-1,Sht 3	T-110	6,400.00
12	Rubber Expansion Joint	1	N/A	M4-1,Sht 4	XJ-03	1,334.00
13	Deaerator	1	A-8	M4-1,Sht 3	T-101	8,786.00
14	Evaporator	1	A-9,A-10	M4-1,Sht 4	E-120	272,804.84
15	Recirculation Pump	1	A-10,A-11	M4-1,Sht 4	P-121	12,257.00
16	Evaporator Recirc Ducts	1	A-10	M4-1,Sht 4	w/ P-121	43,230.00
17	Evap Vapor Ducts/Seal Leg	1	A-11	M4-1,Sht 5	E-130	21,600.00
18	Seed Tank	1	A-11	M4-1,Sht 4	T-151	8,062.00
19	Seed Tank Mixer	1	A-11	M4-1,Sht 4	MX-152	1,353.00
20	Seed Pump	1	A-11	M4-1,Sht 5	P-150	2,953.00
21	Vapor Compressor	1	A-11,A-12	M4-1,Sht 6	K-131	83,474.08
22	Spray Dryer Feed Tank	1	A-14	M4-1,Sht 6	T-300	24,815.00
23	Spray Dryer Feed Pump	1	A-14	M4-1,Sht 6	P-301	3,220.00
24	Spray Dryer Feed Tank Mixer	1	A-14	M4-1,Sht 6	MX-302	8,884.00
25	Spray Dryer Unit	1	A-14	M5-1,Sht 2	Niro PFD	497,222.00
26	Startup Boiler	1	--	M4-1,Sht 7	B-101	7,755.00
27	Vertical Sump Pump	2	--	--	--	9,920.00
28	Drain Sump Mixer	1	--	--	--	3,730.00
29	PLC Cabinet	1	N/A	M5-1,Sht 1	N/A	4,912.00
30	PLC	1	N/A	M5-1,Sht 1	N/A	42,660.60
31	Skids & Platforms	Lot	N/A	M4 shaded	N/A	164,520.00
32	MCC, 480V & 120V	2	N/A	M5-1,Sht 1	N/A	18,357.40
33	Transmitters & Flowmeters	Lot	N/A	All M4 shts	Various	29,722.86
34	Pressure Regulators	Lot	N/A	M4 shts	Various	2,701.02
35	Level Switches & Indicator	Lot	N/A	M4 shts	Various	5,717.00
36	Pressure & Temp Indicators	Lot	N/A	M4 shts	Various	3,803.00
37	Control Valves	Lot	N/A	M4 shts	Various	27,253.00
38	Lab Equipment	Lot	N/A	N/A	N/A	3,860.51

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DISTRICT ROUTING SLIP

TO: Bob Butera DATE: 4/16/97

CC To:

	PENSACOLA	**NORTHWEST DISTRICT**	
	Panama City	Northwest District Branch Office	
	Tallahassee	Northwest District Branch Office	
	Sopchoppy	Northwest District Satellite Office	
X	**TAMPA**	**SOUTHWEST DISTRICT**	
	Punta Gorda	Southwest District Branch Office	
	Bartow	Southwest District Satellite Office	
	ORLANDO	**CENTRAL DISTRICT**	
	Melbourne	Central District Satellite Office	
	JACKSONVILLE	**NORTHEAST DISTRICT**	
	Gainesville	Northeast District Branch Office	
	FORT MYERS	**SOUTH DISTRICT**	
	Marathon	South District Branch Office	
	WEST PALM BEACH	**SOUTHEAST DISTRICT**	
	Port St. Lucie	Southeast District Branch Office	

☐ Reply Optional Date Due _____ ☐ Reply Required Date Due: _____ ☒ Info Only

RECEIVED APR 18 1997 DEP

Comments:

Please add this attachment to your file copy.

RECEIVED APR 18 1997 DEP

From: Jean Lee Clark Tel.: 850 921-9967

08-18-93

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

April 16, 1997

Mr. Mike Spann
Project Manager
Resources Conservation Company
3006 Northrup Way
Bellevue, WA 98004-1407

Dear Mr. Spann:

We have reviewed your Application for Final Examination and Certification of resource recovery equipment at the Pasco County Resource Recovery Plant. We have determined that your application is incomplete because no equipment cost is shown for the deaerator and evaporator (Items 13 and 14 on page 3 of the application). Please forward these missing cost figures.

Thank you for forwarding the copies of the complete contract I requested. Upon receipt of this additional information requested, we will complete our examination of your application. Should you have any questions about the additional information we have requested, please feel free to call me at (904) 488-0300.

Sincerely,

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

cc: Bob Butera
Melton McKown
File

RECEIVED
APR 18 1997
D E P

PASCO COUNTY, FLORIDA

May 18, 1995

Mr. Joe Bostjancic
Resources Conservation Company
3006 Northup Way
Bellevue, WA 98004-1407

RE: Agreement Between Resources Conservation Company and Pasco County for Provision and Installation of Leachate Treatment Equipment

Dear Mr. Bostjancic:

At the May 16, 1995 meeting of the Pasco County Board of County Commissioners, the above-mentioned agenda item was approved. Attached is an original agreement for your file.

If you have any questions, please contact the Secretarial Services Department at 38053 Live Oak Avenue, Dade City, FL 33525-3819 or call (904) 521-4156.

Sincerely,

JED PITTMAN
CLERK TO THE BOARD

By: Debbie Olszanski
Deputy Clerk

JP/do

Enclosure

RECEIVED
MAY 24 1995

ORIGINAL

95-319

AGREEMENT BETWEEN RESOURCES CONSERVATION COMPANY AND PASCO COUNTY FOR PROVISION AND INSTALLATION OF LEACHATE TREATMENT EQUIPMENT

THIS CONTRACT AGREEMENT, entered into this ____ day of _____, 1995, by and between RESOURCES CONSERVATION COMPANY, (RCC) a Division of Ionics, Incorporated, a Massachusetts corporation with its RCC Division principal offices in Bellevue, Washington, hereinafter called the "SELLER" and PASCO COUNTY, FLORIDA, a political subdivision of the State of Florida, hereinafter called the OWNER.

WITNESSETH:

WHEREAS, a Technical Memorandum titled "Leachate Management System at West Pasco Landfill" was prepared on the OWNER'S behalf and recommended that the OWNER treat leachate from the ashfill using a physical, evaporative process; and

WHEREAS, the OWNER undertook a Request for Qualification and Experience ("RFQ") process to solicit and consider qualifications and technologies from companies interested in providing equipment and services in connection with treating leachate employing physical, evaporative processes and the SELLER submitted a Statement of Qualifications in response to the RFQ; and

WHEREAS, interviews were held with several companies and RESOURCES CONSERVATION COMPANY, a Division of Ionics was recommended by the selection committee in reliance upon the SELLER's experience and expertise in treating leachate as represented in the SELLER's Statement of Qualifications and during said interview; and

WHEREAS, on December 6, 1994, the Pasco County Board of County Commissioners authorized County Staff to begin negotiations with the SELLER for the procurement of leachate treatment equipment; and

WHEREAS, upon completion of start-up, the leachate treatment facility will eliminate the need to treat leachate at the Shady Hills WWTP and will result in the production of a high quality distilled water and a dry calcium salt; and

WHEREAS, the OWNER and the SELLER mutually agree that the SELLER will provide equipment, design, installation and start-up services, and license agreement for the West Pasco Ashfill Leachate Treatment Facility using the SELLER's Propriety Vapor Compression Evaporation process.

NOW, THEREFORE, in consideration of the mutual promises and covenants herein contained, it is agreed as follows:

ARTICLE I - TERMS OF AGREEMENT

This Agreement shall commence on the date of execution. Both parties mutually agree to the terms, conditions and schedules hereinafter specified in the Contract Documents by the laws, rules, and regulations of the State of Florida, and any resolutions needed to resolve conflicts shall be settled in Pasco County, Florida.

ARTICLE II - THE WORK

That the SELLER shall furnish, at the Pasco County Resource Recovery Plant site, Hudson, Florida, and install the leachate treatment system, and ancillary technical services, complete in accordance with the Contract Documents, as identified herein and attached hereto and made a part hereof, and the SELLER shall execute and complete all of the Work included in the Contract Documents.

ARTICLE III - PAYMENT

The OWNER shall pay to the SELLER for the work embraced in this Contract Agreement, and the SELLER will accept as full compensation therefor payment in the following manner:

2.1 FIRM FIXED PRICE SUPPLY

For the FIXED PRICE of, $1,274,000.00 design, management, check-out, start-up, technical training services (limited to the number of hours set forth below) and supply to the above referenced site the PROPRIETARY EQUIPMENT listed below. The above FIXED PRICE also includes a TECHNOLOGY FEE, the payment of which allows the OWNER unrestricted use of the PROPRIETARY EQUIPMENT. The following is included in the FIXED PRICE:

- LABOR
  - Engineering Design
  - Installation Design
  - Project Management
  - Project Engineering
  - Purchasing
  - Check out, start-up and training at 160 hours
  - Travel and Expenses

- PROPRIETARY EQUIPMENT
  - Evaporator Concentrator using calcium sulfate seed slurry technique also including:
    - Condenser
    - Tubes
    - Tubesheets
    - Sump
    - Brine Strainer
    - Mist Eliminator
    - Distributors
    - Deaerator
    - Packing
    - Freight

- TECHNOLOGY FEE

2.2 COST REIMBURSABLE SUPPLY

All equipment (excluding the proprietary equipment listed in Section 2.1,above) freight, installation, and the performance bond will be supplied on a cost reimbursable basis. These items are listed below:

Vapor Ducts w/Expansion Joints (1 set)
Recirculation Ducts w/Expansion Joints (1 set)
Heat Exchanger
Vapor Compressor
Recirculation Pump & Motor
Feed Pump & Motor
Feed Tank
Feed Tank Mixer & Motor
Distillate Pump & Motor
Distillate Tank
Seed Pump & Motor
Seed Tank
Seed Tank Mixer & Motor
Spray Dryer Feed Tank
Spray Dryer Feed Tank Mixer & Motor
Acid Pump & Motor (2)
Scale Inhibitor Pump & Motor (2)
Scale Inhibitor Tank
Sodium Sulfate Pump & Motor (2)
Sodium Sulfate Tank
Sodium Sulfate Tank Mixer & Motor
Startup/Makeup Boiler
Spray Dryer Feed Pump & Motor
Spray Dryer Equipment
Equipment Skids
Field Instrumentation & Controls
PLC Control System
- Control Cabinet
- CRT Operator Interface CPU
- Control View

Motor Control Center
Freight on Cost-Reimbursable Equipment
Installation/Construction
Performance & Payment Bond

For all Work included in the Contract Documents, payment shall be made in the manner provided in the Contract Documents attached hereto.

ARTICLE IV - THE CONTRACT DOCUMENTS

The Contract Documents referred to in Article I are:

(1) this Contract Agreement (Document No. 1);
(2) the Special Conditions (Document No. 2);
(3) the General Conditions (Document No. 3);
(4) OWNER's site and facility design drawings and specifications (Document No. 4);
(5) SELLER's Conformed Proposal (Document No.5); and
(6) Any mutually agreed upon and duly executed change orders and/or supplemental agreements.

ARTICLE V - NONASSIGNMENT

The SELLER shall not assign, transfer, convey, or otherwise hypothecate any interest, right, duties, or obligations hereunder, or any part thereof, without the prior written consent of the OWNER.

WHEREFORE, THIS agreement has been executed on behalf of the OWNER and SELLER as of the Agreement Date.

(SEAL)

BOARD OF COUNTY COMMISSIONERS
OF PASCO COUNTY, FLORIDA

ATTEST:

BY: _____
JED PITTMAN, CLERK

BY: _____
SYLVIA YOUNG, CHAIRMAN

(SEAL)

RESOURCES CONSERVATION COMPANY
A Division of Ionics, Inc.

ATTEST:

BY: _____

BY: _____
VICE PRESIDENT

APPROVED AS TO LEGAL FORM AND CONTENT
Office of the County Attorney

By: _____
Attorney

GENERAL CONDITIONS

FOR

THE SUPPLY AND INSTALLATION OF EQUIPMENT

AND TECHNICAL SERVICES

TABLE OF CONTENTS

1.0 DEFINITIONS

1.1 The term "Seller" shall mean Resources Conservation Company, a Division of Ionics, Incorporated, with principal business offices at Bellevue, Washington.

1.2 The term "Owner" shall have the meaning set forth in the Special Conditions.

1.3 The term "Subcontractor" shall mean the person or firm with whom Seller enters into a Subcontract or with whom Seller places a Purchase Order to supply portions of the Goods or Equipment or otherwise to perform Work for Seller under this Contract.

1.4 The term "Lower Tier Subcontractor" shall mean any person or firm contracting with a Subcontractor, or with any other Lower Tier Subcontractor to supply portions of the Goods or Equipment or otherwise to perform Work for Seller under this Contract.

1.5 The terms "Goods" or "Equipment" shall mean those articles, materials, and supplies which are to be furnished to Owner under this Contract.

1.6 The term "Deliverable Documents" shall mean those drawings, plans, reports, installation instructions, installation manuals, operation and maintenance manuals, or documents, data, or information, in any tangible medium of expression, whether in written form or in any machine readable form including magnetic or optical discs or tape or the like, which are required to be furnished by Seller to Owner under this Contract.

1.7 The term "Work" shall mean the entire completed supply of (a) Deliverable Documents, (b) the various separately identifiable parts of Goods or Equipment, (c) the provision of Technical Services, and (d) the installation of all equipment necessary to start-up and operate the facility which is not identified in the Owner's Site and Facility design Drawing and Specifications, as required for the performance of this Contract in accordance with the Contract Documents, including the specifications, drawings and other documents attached to or incorporated by reference into this Contract. The Owner's Design Drawings and Specifications shall not specify mechanical, electrical, instrumentation, or control work other than that necessary to deliver utilities to the Project site.

1.8 The term "Contract Documents" shall include the Contract Agreement as executed by the parties (Agreement), Seller's Conformed Proposal (marked as agreed by Seller and Owner) and any documentation accompanying or supplementing such proposal, to the extent attached as an exhibit to the Agreement, these General Conditions, the Special Conditions, and the Owner's site and facility design drawings and specifications, together with all written Addenda, Amendments and Change Orders subsequently executed.

1.9 The term "Contract Price" shall mean the total sum of money payable by the Owner to the Seller for completion of the Work in full accordance with the Contract Documents, as stated in the Contract Agreement, as may be amended in accord with the Contract Documents.

1.10 The term "Project" shall mean the total construction at the Jobsite of which the Work to be provided by Seller under this Contract may be the whole or a part, and which may include equipment, goods, and construction services provided by others.

1.11 The term "Contract Time" shall mean the time stated (by number of days or by dates provided) in the Contract Documents in which or by which the Contractor is required to deliver all of the stated portions of the Equipment and Deliverable Documents and complete the installation, start-up and Acceptance Testing of the facility.

1.12 "Acceptance Testing or Test" means those tests which are required to be carried out and passed to confirm that the Equipment supplied by Seller meets the stated Performance Guarantees and the facility operates in whole as intended and in accordance with the Performance Guarantees.

2.0 COMPLETE AGREEMENT

The Contract Documents, including the Contract Agreement, and any additional documents incorporated therein and attached thereto, constitutes the sole, entire, and complete integrated agreement between the Seller and the Owner with respect to the subject matter hereof. Seller's proposal, marked as conformed, is incorporated into and made a part of the Contract Documents, and to the extent disclosed therein, discloses the nature and description of the Goods, Equipment and its Installation, Deliverable Documents, and Technical Services to be supplied hereunder. The parties shall not be bound by or liable for any statement, representation, promise, or understanding, letters, terms or conditions, whether made prior or contemporaneous herewith, unless the same is set forth herein. No changes, amendments, or modifications of any of the terms and conditions hereof shall be valid unless reduced to writing and signed by both Seller and Owner in accord with the Contract Documents.

3.0 PRECEDENCE OF DOCUMENTS

The order of precedence of the Contract Documents shall be:

First:	Agreed Change Orders and Supplemental Agreements
Second:	The Contract Agreement
Third:	The Special Terms and Conditions
Fourth:	These General Terms and Conditions
Fifth:	The Owner's Site and Facility Design Drawings and Specifications
Sixth:	The Seller's Conformed Proposal

4.0 INDEPENDENT CONTRACTOR STATUS

4.1 Seller shall act as an independent contractor, maintaining complete control over and responsibility for labor and operations utilized to perform the Work, and for the manner, means and method for performing the Work, except to the extent a particular manner, means or method is specifically required by the Contract Documents.

4.2 No provision of this Contract shall be construed to create any contractual relationship between the Owner and any Subcontractor or Lower Tier Subcontractor, nor is any provision of this Contract intended to confer any rights as third-party beneficiary to any Subcontractor or Lower Tier Subcontractor. No provision of this Subcontract shall create any obligation on the part of Owner to pay or see to the payment of any Subcontractor or Lower Tier Subcontractor except as may be required by applicable law.

5.0 SUBCONTRACTORS AND LOWER TIER SUBCONTRACTORS

5.1 Seller shall be fully responsible to Owner for all acts and omissions of Subcontractors and Lower Tier Subcontractors performing or furnishing any of the Work under a direct or indirect contract with Seller to the same extent Seller is responsible for its own acts and omissions.

5.2 If requested in writing by Owner, the Seller shall submit to Owner for approval a written list of proposed Subcontractors with whom it proposes to directly contract. Owner will notify the Seller in writing regarding approval or disapproval of such proposed Subcontractors. Failure of the Owner to do so within ten (10) working days will constitute acceptance of the submitted list.

5.3 Seller shall not employ any Subcontractor, whether initially or as a substitute, against whom Owner may have reasonable objection. Neither shall Seller be required to employ any Subcontractor against whom it has reasonable objection. If Owner requires a change to the proposed list of Subcontractors, or requires sole source procurement rather than competitive procurement of specified Goods or Equipment, then the Contract Price shall be increased or decreased by the difference caused by such change or requirement. Such changes or requirement shall be documented by Change Order. Acceptance by Owner of any Subcontractor shall not constitute a waiver of any right to require rework or to reject defective Work, or otherwise insist upon compliance with the Contract Documents.

6.0 PERFORMANCE AND PAYMENT BONDS

6.1 If required by the Special Conditions, or otherwise under the Contract Documents, then within thirty (30) days after execution of the Contract Agreement, or within such further time as Owner may allow in writing, Seller shall deliver to Owner a

performance and/or payment bond executed by a corporate surety reasonably acceptable to Owner and licensed in the locale of the Project, and in the amount of the Contract Price (unless otherwise agreed). Failure to deliver acceptable bond(s) within the time allowed shall entitle Owner to terminate the Contract for default.

6.2 If any surety for any payment or performance bond becomes unacceptable to Owner, or if the Contract Price is increased more than fifteen percent (15%) by Change Order or Supplemental Agreement after such bonds are delivered, Seller shall promptly deliver such acceptable additional or substitute bonds, in so far as Owner may reasonably require.

7.0 COORDINATION WITH OTHER WORK AT THE SITE

7.1 Owner may perform other work with its own forces or award other contracts related to the Project of which the Work under this Contract is a part. Such other work may involve work at the jobsite contemporaneous with the Seller's Work, and in close physical proximity thereto.

7.2 Owner shall afford Seller's personnel performing Technical Services or other work at the jobsite proper and safe access to the Equipment as necessary and reasonable for conducting required checkout and testing and shall provide a reasonable opportunity for the introduction and storage of materials and operation of tools and equipment as necessary for the safe and proper provision of such Technical Services, and shall properly coordinate the Sellers' Work with such other work.

7.3 If the proper execution of or results from any part of Seller's Work depends upon the work of any other person or contractor at the jobsite, Seller shall report to the Owner any uncompleted or defective work that renders it unsuitable for the proper installation, operation, or maintenance of the Equipment, or otherwise hinders the execution of which may adversely impact the results of Seller's Work.

7.4 Whenever the Seller's Work is so related to other work that the work of one must be complete before the work of the other can proceed, or where the work of one must be interrupted to permit performance of the work of another, or where both must share the use of facilities, equipment, access or work areas, or where other aspects of coordination are required, the Owner shall upon request of the Seller assist in the sequencing and scheduling of the Work with such other work. In the event of disagreements, the decision of the Owner shall be final. In such determinations, the Owner shall seek to accomplish the most expeditious and efficient progress of the Project as a whole, and Seller shall comply with determinations made pursuant to this paragraph.

7.5 If, as a result of Owner's direction or interference or incomplete work by others results in additional time required for the provision of Technical Services by Seller,

then, to the extent such additional time is not due to the fault of or delay by the Seller, the Seller shall be entitled to additional compensation at the rates set forth in the Special Conditions.

8.0 PREMIUM TIME

8.1 Premium time planned by Seller or its subcontractors of any tier to meet the Contract Time shall be included as part of the Contract Price.

8.2 Unless otherwise set forth in the Contract Documents, the provision of Technical Services shall be on a regular time basis, and any requirements for extended or additional hours or days of Technical Services shall entitle Seller to reimbursement at the rates stated in the Special Conditions.

9.0 ASSIGNMENT

9.1 Neither Seller nor Owner shall assign this Contract Agreement by any means without the prior written consent of the other party, which consent shall not be unreasonably withheld.

10.0 LAWS AND ORDINANCES

10.1 Seller shall familiarize itself with and at no additional cost, comply with all applicable published requirements, including laws, regulations, ordinances, rules, or codes of the United States and of the state and local jurisdiction of the Project, including all US Federal and state Occupational Safety and Health Act (OSHA) requirements, which are in force and effect as of the date of execution of the Contract Agreement. Seller shall require similar compliance by all Subcontractors. Seller hereby agrees to indemnify and save harmless Owner from and against any claim arising from the violation of any such laws, regulations, ordinances, rules, codes and orders, whether by Seller, or its Subcontractors or Lower Tier Subcontractors, or any of their employees or agents. All fines or costs of compliance based on any violations of such requirements shall be the responsibility of Seller and will not be paid by Owner, and Seller's failure to take into account any of such requirements shall not relieve Seller from responsibility for completing the Work at the agreed Contract Price and within the Contract Time. However, with respect to any changed or newly applicable requirements arising after the date of execution of the Contract Agreement, to the extent caused by such changed requirement, an equitable adjustment shall be provided to the Contract Price and to the Contract Time.

11.0 CODES AND STANDARDS

11.1 Seller's Work shall comply with all of the applicable requirements of statutes, ordinances, codes and standards of all legally constituted authorities having jurisdiction. Seller shall obtain certificates of compliance where required.

11.2 Where the Contract Documents make reference to applicable codes and standards, the materials, equipment and Work shall, except to the extent specifically noted therein, conform to the latest issue of such statutes, codes or standards, or to the referenced portion thereof, in effect as of the date of execution of the Contract Agreement. Conformance with subsequently dated statutes, codes or standards may be incorporated into the Work at the request of the Owner, provided that the Owner issues a Change Order to equitably adjust the Contract Price or Contract Time to reflect the impact of such change to the extent reasonably supported by Seller provided documentation in regard thereto.

11.3 Where specific codes or standards are not referenced for Goods, materials, Equipment or Work, then the Seller's usual specifications for like equipment, first, and second, the accepted industry standards applicable to the Goods, materials, Equipment or Work, shall govern.

11.4 To the extent of any conflict between applicable codes and standards, the code or standard having the more stringent requirements shall govern, unless otherwise directed by the Owner in writing.

12.0 PERMITS, LICENSES, FEES AND NOTICES

Consistent with the Sellers' scope of Work, Seller and its Subcontractors shall comply with the licensing requirements of all applicable local, state and Federal agencies for the jurisdiction(s)in which the Work or parts thereof are performed, and shall obtain all applicable licenses and permits, and shall pay all applicable fees.

13.0 PROTECTION AGAINST LIENS AND CLAIMS

13.1 Seller shall, at all times, promptly pay for all materials, equipment and labor used or employed in the Work. Seller shall furnish Owner, upon request, with reasonable evidence of compliance by Seller with this requirement, including lien waivers.

13.2 As a condition to any partial payment to be made under this Contract, the Owner may require Seller to execute a waiver and release, in a form reasonably acceptable to Owner, as to statutory construction lien rights and similar lien rights of Seller relating to the Work to the extent of the cumulative amount actually paid by Owner to Seller through and including such partial payment.

13.4 As a condition to Final Payment under this Contract, Seller shall execute a final waiver, release, and indemnity, in a form reasonably acceptable to Owner, as to any and all claims of Seller relating to the Work and as to any and all claims that have been or may be made or filed by Seller or Seller's Subcontractors or Lower Tier Subcontractors relating to the Work.

13.5 Upon full payment by Owner, Seller shall keep the Project and the materials, Goods, Equipment, structures, buildings, premises and property involved in the Work or wherein the Goods and Equipment are or are to be installed free and clear of liens of any kind resulting from performance of the Contract by Sellers, it Subcontractors, or Lower Tier Subcontractors. Seller shall indemnify and hold Owner harmless from any and all costs or expenses involved in defending, removing or bonding off of any such liens that Seller fails to bond off or otherwise remove within fifteen (15) working days after receipt of written demand by Owner.

14.0 PATENT INFRINGEMENT INDEMNITY

14.1 Seller shall, at its own expense, hold harmless and defend Owner against any claim, suit, or proceeding brought against Owner which is based upon a claim that any Goods, Equipment, or Deliverable Documents, or any part thereof which is furnished by Seller under this Contract, constitutes an infringement of any patent, and Seller shall pay all damages and costs awarded against Owner resulting therefrom.

14.2 If the sale or use of any materials, product, process or equipment (or any part thereof) furnished for, used or incorporated in the Work, should be held in any such suit or proceeding to constitute an infringement and such sale or use is enjoined, Seller shall, at its own expense, either procure for Owner an irrevocable, fully paid license to continue using such equipment, process or material, or replace such materials, product, process or equipment with substantially equal, but noninfringing, equivalents, or modify such materials, product, process or equipment so as to make same approved and equal but noninfringing.

14.3 This indemnity is given upon the condition that Owner shall promptly notify Seller of any suit or proceeding in which such infringement is alleged and for which Owner seeks such indemnification, and Owner shall permit Seller to control completely the defense or compromise of any such allegation of infringement, and Owner shall render such reasonable assistance at Seller's cost in the defense thereof as Seller may require.

14.4 Sellers' obligations under this clause shall not apply to any equipment or any parts thereof manufactured to Owner's detailed design or which results from Owner furnished materials or equipment, or which arise solely due to the combination of Goods and Equipment supplied by Seller with apparatus or equipment provided by others, and the Seller assumes no liability whatsoever in any such event.

15.0 INDEMNIFICATION AND RELEASE

15.1 Seller hereby agrees to indemnify, hold harmless, and defend Owner and its elected officials, officer's, employees, agents, and assigns from and against any and all losses, damages, or liabilities and claims for loss to or damage of property, and for injury to or sickness or death of persons (and for costs and reasonable attorney's fees) which arise out of or in connection with defects in the Goods and Equipment, or to the extent of Seller's fault or negligence in the performance or non-performance of Work under this Contract. However, this clause shall not be construed to require the Seller to indemnify any party against such party's own fault, negligence, or strict liability.

15.2 This indemnification shall not extend to liability, claim, loss or expense arising from written instructions by Owner, where such direction or instructions is the primary cause of bodily injury to persons or damage to property.

15.3 Notwithstanding anything to the contrary herein and irrespective of the fault or negligence of either party, the Seller's liability under this Indemnification Clause, whether arising out of negligence, contract, or otherwise, shall not exceed the Contract Price, or the Scope and Coverage of the insurance provided under this Contract Document, whichever is higher. The Seller shall not be liable to the Owner under this Contract or otherwise for loss of use, loss of profits, business interruption, or other consequential, indirect, or incidental damage or expense, however the same may be caused.

16.0 INSURANCE

16.1 Seller shall procure and maintain in full force and effect during the performance of this Contract such liability and other insurance in the types and amounts shown below with insurers reasonably satisfactory to Owner.

(a) Worker's Compensation:
Statutory requirements at the location of Work and in accordance with the statutory requirements applicable to Seller's Technical Services or other Work under this Contract.

(b) Employer's Liability:
To the extent included under the applicable Worker's Compensation policy.

(c) Commercial General Liability:
(1) Bodily Injury - $1,000,000 each occurrence*
(2) Property Damage -$1,000,000 each occurrence*

(d) Comprehensive Automobile Liability:

(1) Bodily Injury - $1,000,000 each person*
$1,000,000 each occurrence*

(2) Property Damage -$1,000,000 each occurrence*

* Combined single limit policies for Bodily Injury and for Property Damage are acceptable provided the coverage is not less than $2,000,000 each occurrence.

16.2 The policy of insurance which affords Commercial General Liability shall contain a provision or endorsement stating that such insurance applies to the liability assumed by Seller under this Contract, subject to all of the terms and conditions of such insurance and includes the Owner as an additional insured only as regards liability arising out of operations performed for Owner by Seller under this Contract.

16.3 Seller shall submit to Owner an original certificate of insurance evidencing the insurance required herein within thirty (30) days after the date of execution of the Contract Agreement, or before commencing the Work at the site of the Project, whichever first occurs. All certificates shall contain a provision or endorsement that the coverage afforded will not be cancelled, materially changed or renewal refused until at least thirty (30) days prior written notice has been given to Owner. In addition to the certificate of insurance, Seller shall provide certified copies of all policies required under this Section.

16.4 All Risk (Builder's Risk) Insurance

Unless otherwise specifically provided elsewhere in the Contract Documents, Owner shall provide for the benefit of Seller and its Subcontractors performing work at the site of the Project "All Risk" Builder's risk insurance (or equivalent protection under Owner's operating plant insurance) with a limit of the replacement cost of the Project, subject to a deductible not to exceed $100,000 each occurrence for "hot testing" perils; $50,000 each occurrence for earthquake, hurricane, and flood, and boiler and machinery perils; and $25,000 each occurrence for all other perils. The applicable deductible shall be borne by Seller if physical loss or damage to the Project results from the fault or negligence of Seller or any of its Subcontractors or Lower Tier Subcontractors.

Such coverage shall insure all materials, supplies, and equipment that are installed in the Project or that are intended for specific installation in the Project while such materials, supplies, and equipment are located at the jobsite or while temporarily located away from the jobsite for the purpose of storage at the risk of the insured parties.

The above described Builder's Risk insurance policy shall be endorsed (a) waiving the carrier's rights of recovery under subrogation against the Seller and its Subcontractors

and Lower Tier Subcontractors whose interests are insured under such policy; and (b) so as to provide that the insurer will not cancel such insurance without giving thirty (30) days prior notice to Seller.

Seller, its Subcontractors, and any Lower Tier Subcontractors shall, at their own expense, insure their own equipment, machinery, and tools in such amounts as they deem appropriate, and shall bear the risk of loss thereof, and accordingly the insurance provided herein shall not include coverage for any clothing or tools of workmen, or tools and equipment owned, rented or used by the Seller or its Subcontractors of any tier in connection with the performance of the Work. Owner shall have no obligation to provide insurance for such items.

16.5 Insurance required under this section must be written by an insuror authorized to do business the the state of Florida and also have an "A" policy holders rating and a financial rating of at least Class VIII in accordance with the most current Best's rating.

17.0 TAXES, UNEMPLOYMENT AND OTHER INSURANCE BENEFITS

17.1 Taxes

Except to the extent expressly provided in the Special Conditions, the Contract Price is exclusive of any applicable federal, state, county or local sales, use, transaction privilege, consumer, use or other similar taxes which are applicable to Seller's performance of the Work hereunder, and unless otherwise provided, all such sums shall be reimbursed by Owner as incurred or assessed.

17.2 Unemployment and Other Insurance Benefits

Seller has full and exclusive responsibility for the payment of any and all taxes and contributions levied or assessed against Seller, its Subcontractors, or Lower Tier Subcontractors, or any of their agents, consultants or employees, for unemployment insurance, retirement benefits, pensions or annuities now imposed or hereafter imposed by any federal, state, county or local governmental entity that are measured by wages, salaries or other remuneration paid to such persons in connection with performance of the Work.

18.0 CHANGES BY THE OWNER

18.1 Owner may, without invalidating this Contract and without notice to any surety, at any time or from time to time, order changes within the general scope of the Contract, including but not limited to additions, deletions or other revisions to the Work. Such changes shall be authorized by Change Order or directed by written notice from the Owner, and such changes shall be effective upon delivery of such written notice or

Change Order to Seller. Upon receipt of any such document, Seller shall proceed promptly with the Work as so changed, and any added Work shall be performed in accordance with the applicable provisions of the Contract Documents, except as may be otherwise specifically provided.

18.2 To the extent necessary as a result of any written notice or Change Order from the Owner, the Contract Price and Contract Time shall be equitably adjusted, provided a timely request for such adjustment is made by Seller. Seller shall not be entitled to any change in the Contract Price or the Contract Time for any change not ordered in writing by the Owner. The Price and Contract Time may be changed only by Change Order or Contract Amendment.

18.3 To the extent that Seller claims that any written direction by Owner entitles Seller to an equitable adjustment in Price, Contract Time or both, Seller shall give Owner written notice of its claim within a reasonable period of time, not later than twenty (20) working days after the receipt of such notice or the date Seller reasonably determines the impact of such direction by Owner, whichever shall last occur. In the absence of actual notice to Owner, failure of the Seller to give such written notice shall deprive the Seller of any right to additional compensation or extension of time.

18.4 Seller shall furnish a cost proposal containing a price breakdown in support of any request for an adjustment in the Price. The breakdown shall detail to the reasonable satisfaction of Owner all material, labor, equipment and other costs involved in the alleged change, as well as any requested overhead and profit, whether the change involves added or deleted work. Amounts claimed for Subcontractors shall be supported by a similar price breakdown, or by competitive bids. In addition, if the cost proposal includes a time extension, a justification therefore shall be furnished. Cost proposals shall be furnished by Seller in a timely manner, and in any event in sufficient time to meet any reasonable requirements of Owner for evaluation and approval.

18.5 A Change Order signed by the Owner and Seller indicates their agreement therewith, including any adjustment in the Contract Price and Contract Time.

18.6 If Owner and Seller are unable to agree as to the extent, if any, of any adjustment in Contract Price or Contract Time that should be allowed as the result of any change ordered or directed by Owner, then (1) Seller may make such claim therefore as allowed by the Contract Documents, including Clauses 18.3 and 19.0, and (2) Seller shall nonetheless timely perform the Work as changed by Owner's written direction. Once Seller receives Owner's written direction, Seller shall diligently prosecuted the work as changed by such written direction.

19.0 CLAIMS BY SELLER

19.1 Any claim of Seller for any equitable adjustment under the terms of this Contract shall be in writing and include complete documentation of the requested adjustment of the Contract Price and, if applicable, Contract Time, in accord with Clause 18.3.

20.0 DELAYS AND TIME EXTENSIONS

20.1 Seller shall diligently prosecute the Work so as to achieve its delivery of Goods, Equipment, Equipment Installation, and Deliverable Documents within the Contract Time.

20.2 Should Seller be delayed in the performance of the Work by the actions or omissions of Owner, or by Force Majeure event, Owner shall upon timely notice and substantiated request by Seller extend the Contract Time for a period equal to the actual delay in completion due to such cause. Seller shall give Owner written notice of any such delay within five (5) working days of the commencement of such delay.

20.3 "Force majeure" events are defined as unanticipated occurrences or acts beyond the control and without the fault of Owner or Seller, including without limitation, acts of God, storms, floods, fires, abnormal adverse weather conditions for the Project site area, strikes, boycotts, lockouts or other labor disputes, acts or neglect of other contractors at the Project who are not subcontractors of the Seller, delays in the transportation and delivery of materials and equipment that could not have reasonably been foreseen and provided for, and acts or failure to act of any governmental agencies or officers or subdivisions thereof. Acts and omissions of or attributable to a Subcontractor or Lower Tier Subcontractor are deemed to be within the control of Seller.

21.0 CANCELLATION

21.1 Owner may terminate the Contract Agreement at any time by written notice to Seller as to all or any portion of the Work not then completed or Equipment not then shipped, subject to an equitable adjustment between the parties which provides for payment to the Seller for its costs, including overhead and cancellation fees by Subcontractors of any tier, and a reasonable profit on the Work actually performed, with respect to any of the Work or nonrecoverable costs of work on Equipment then in progress; provided that no such equitable adjustment is to be made in favor of Seller with respect to any Equipment which are Seller's standard stock and provided that the equitable adjustment, together with any amount previously paid by Owner shall in no case exceed the Contract price. No such termination shall relieve Owner or Seller of any of their obligations as to any Work or Equipment delivered hereunder. Any claim for adjustment hereunder must be asserted within thirty (30) Days from the date when the change or termination is ordered, and accompanied by a detailed written statement of the claimed costs.

21.2 If Seller should be adjudged bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, or if it should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it should fail to make prompt payment to Subcontractors or Suppliers for material or labor, or persistently disregard laws, ordinances or the instructions of Owner, or otherwise be guilty of a substantial violation of any provision of the Contract Agreement, then Owner, upon the certification that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving Seller ten (10) working days written notice, terminate the employment of Seller and take possession of the premises and of all materials, tools and equipment thereon and finish the Work by whatever method it may deem expedient. In such cases Seller shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the contract price shall exceed the expense of finishing the Work including compensation for additional managerial and administrative services, such excess shall be paid to Seller. If such expense shall exceed such unpaid balance, Seller shall pay the difference to Owner. The expense incurred by Owner as herein provided, and the damage incurred through Seller's default, shall be certified by Owner.

21.3 If Owner should (a) be adjudged a bankrupt, or (b)if it should make a general assignment for benefit of its creditors, or (c) if the Owner should fail to make any payment on any invoice (or on the undisputed portions thereof) within thirty (30) Days after it is due, or (d) if Owner should fail to pay Seller within thirty (30) Days of its maturity and presentation any sum certified by an Arbitrator or awarded by a court, then in any such event, Seller may, upon five (5) working days written notice to Owner, stop work under this Contract. If the Owner should thereafter continue to fail to pay to Seller all sums then due and payable, or in the case of items (a) or (b) fail to provide adequate security to Seller with respect to future payments, then within thirty (30) days after receiving such stop work notice, the Seller shall have the right to terminate this Contract and to recover from Owner payment for all Work executed and any loss sustained upon any Goods, Equipment, Deliverable Documents, or other labor and materials, and Seller's reasonable profit and overhead for that portion of the Work actually performed. All payments made more than forty five (45) days after the date of receipt by Owner of Seller's invoice shall bear simple annual interest at the rate of 12 percent per annum, or the maximum rate of interest allowed by law, whichever is the lower.

22.0 SUBSTANTIAL DELAY OR SUSPENSION OF THE WORK

Owner, at any time prior to completion of the Work or delivery of the Equipment, may require Seller to delay or suspend completion of the Work or delivery of the Equipment. During such a period of delay or suspension, Seller shall use its best efforts to utilize its plant, labor, equipment, and subcontracts in such a manner as to minimize the costs

associated with such delay or suspension. Seller shall store and protect, as necessary, completed parts of the Work or the Equipment. Owner shall reimburse Seller for the reasonable and nonrecoverable costs directly resulting from such delay or suspension, as actually incurred, including storage costs and costs directly associated with the rescheduling or Seller's performance under the Contract. A detailed statement of such costs shall be submitted, in writing, to Owner in support of Seller's claim.

23.0 DISPUTE RESOLUTION - ARBITRATION

23.1 Any claims by the Seller for additional compensation or time extensions, or questions as to the interpretation, meaning or intent of the Contract Documents shall be submitted to Owner in writing, and Owner shall respond thereto in writing within a reasonable time. Upon written request of either party following such submission and response, any claim or dispute arising out of or relating to this Contract, or the breach thereof, shall be discussed, and satisfactory resolution attempted, by representatives of each party with authority to bind such party.

23.2 Except for legal action which may be necessary to protect Seller's intellectual property rights, any claims or disputes arising out of or relating to this Contract, or the breach thereof, that remain in dispute following such discussions between the parties as set forth above, shall be finally settled and resolved by arbitration in accordance with the Construction Industry Rules of the American Arbitration Association (AAA) in force at that time,unless the dispute is of a technical nature involving engineering judgement in which case the dispute shall be resolved in accordance with Section 23.3 below, and unless the parties mutually agree otherwise. The arbitration shall be conducted before a single neutral arbitrator mutually agreed upon by Seller and Owner. Arbitration shall be commenced only by the filing by either party of a demand for arbitration with that AAA office closest to the Project site, and with the other party hereto. The foregoing agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. Should the parties fail to agree upon a mutually acceptable arbitrator after three (3) attempts by the AAA to reach such agreement, a neutral arbitrator may be appointed by the AAA. Discovery shall be available to the parties during the arbitration in accord with the then current Federal Rules of Civil Procedure in the locale in which the arbitration is held. The arbitration award shall be final and judgment may be entered upon it in any court of competent jurisdiction. A demand for arbitration must be made within a reasonable time after the dispute has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such dispute would be barred by the applicable statute of limitations.

23.3 Any technical dispute involving engineering judgement between the parties shall be resolved by binding arbitration by an Independent Consulting Engineer selected by mutual agreement of the Owner and Seller. The Proceedings shall be initiated by written notice to the other party and then the parties shall undertake to select the

Independent Consulting Engineer within 10 work days. The Independent Consulting Engineer shall upon selection and notification assume exclusive jurisdiction of the dispute. The Independent Consulting Engineer shall be required to make a final binding determination of such technical dispute within thirty (30) days of his notification by the parties. The determination of the Independent Consulting Engineer shall be made in writing and shall contain the written findings of facts on which his decision is based, and each party hereby waives any objection to admission of such binding final order in any court of appropriate jurisdiction, and such final order shall be binding on the parties as to all issues, factual or otherwise, with respect to such dispute, shall not be subject to appeal or review and may be specifically enforced by a party in any court of appropriate jurisdiction. The Independent Consulting Engineer shall determine a fair and equitable allocation of reasonable expenses of both parties incurred in connection with the resolution of any dispute hereunder, which expense associated with each dispute shall be borne and paid by the party losing the dispute.

23.4 Seller shall carry on the Work and adhere to the Construction Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any litigation or arbitration, except as may be expressly agreed upon in writing by Owner.

24.0 INSPECTION AND REJECTION

24.1 During the manufacture, fabrication, and construction process, the Owner and its designees and representatives shall have access to the Equipment at all reasonable times for their observation, inspection and testing, and may perform such examination, inspection and testing of materials and workmanship as may be required to assure that the Work meets all requirements of the Contract Documents. As to all areas under Seller's control, Seller shall provide proper and safe conditions for such access.

24.2 If the Contract Documents require any Work (or part thereof) specifically to be inspected, tested or approved, Seller shall be responsible for arranging and obtaining such inspections, tests or approvals and furnish Owner with the required certificates of inspection, test or approval. As to such inspections, tests or approvals required to be obtained, Seller shall give Owner adequate advance notice of its readiness for such inspection, test or approval.

24.3 After delivery of Equipment, the Owner and its designees and representatives may reject or require the rework and correction of any Goods, Equipment, materials, workmanship, or other Work that is defective or is not in conformance with the requirements of the Contract Documents. As directed by Owner, its designees or representatives, Seller shall promptly either correct all defective Work, whether or not fabricated, installed or completed, or, remove it from the site and replace it with Work that complies with all requirements of the Contract Documents.

24.4 If Seller unreasonably fails to promptly proceed with the rework, correction, or the removal and replacement of the non-conforming or defective Work, Owner may correct and remedy any such deficiency at the Seller's expense.

24.5 Except with respect to the Acceptance Test, any inspections, tests or approvals by Owner its designees or representatives prior to Final Acceptance of the Work shall not be a waiver of any of Seller's obligations hereunder, and shall not be construed as an acceptance of the Work or any part thereof.

25.0 MATERIALS AND EQUIPMENT

25.1 Seller shall deliver all Goods, Equipment, and Deliverable Documents to the Project site. Seller shall receive, unload, store and protect all Goods, Equipment, and Deliverable Materials in a reasonable and safe manner so as to avoid loss or damage. Owner shall provide an area suitable for this purpose at the project site. However, the Owner shall not be obligated to provide a covered storage area. The Owner will take reasonable measures to provide for the security of all such Goods, materials and Equipment. [~~remainder of this needs to reflect agreement in section 16.4~~]

25.2 Seller shall provide a Quality Assurance and Quality Control program and, where required, physically inspect all Goods, materials and Equipment to be utilized in performing or incorporated into the Work to assure that the Equipment is delivered to the Project site free from any damage or defects, installed in the Project accordance with all plans and specifications and in compliance with applicable codes, and in compliance with the requirements of the Contract Documents. Owner, and their designees and representatives may make shop inspections of materials and equipment to the extent they deem necessary. The making or failure to make any such shop inspections shall not relieve Seller from responsibility for providing Goods, materials and Equipment fully in accordance with the requirements of the Contract Documents. Owner will notify Seller sufficiently in advance of any intended shop inspections to permit Seller to make appropriate arrangements.

26.0 EQUIVALENTS

26.1 Owner-Furnished Items

Equipment and materials to be furnished by Owner will not be subject to substitution by Seller. However, Seller shall have the right of rejection of such equipment or materials to the extent Seller can reasonably show adverse effects of the supply on Seller's ability to meet the Performance Guarantees or with respect to Equipment reliability.

26.2 Seller-Furnished Items

Should Owner require the use of a specified vendor or manufacturer which results in additional cost to Seller, the Seller shall be entitled to additional compensation for the additional costs and/or additional time required for performance.

27.0 SELLER'S REPRESENTATIVE FOR PROVISION OF TECHNICAL SERVICES

27.1 Seller shall supervise, inspect and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Seller shall be responsible for seeing that the completed Work complies accurately and in all respects with the Contract Documents.

27.2 Seller shall furnish at the Work site a competent field representative and any necessary assistants for provision of Technical Services. Should the performance of Seller's field representative or an assistant be unsatisfactory or, in the opinion of Owner, detrimental to the best interest of the Project, Seller shall remove such individual from the Project site within five (5) working days after receipt of a written request to do so by Owner, and provide an acceptable replacement for provision of Technical Services.

28.0 ACCIDENT REPORTS AND SAFETY

28.1 Seller shall be responsible for initiating, maintaining and supervising all safety precautions and programs for Sellers personnel performing Technical Services in connection with the Work. Seller shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to persons and Equipment. Seller shall conform to all federal, state, local, and Owner safety regulations and requirements applicable to the Work.

28.2 Owner may stop Seller's performance of the Work (or any part thereof) if, in the reasonable opinion of Owner the Seller is performing the Work in a hazardous or dangerous manner. Work so stopped shall not thereafter proceed until Seller provides adequate assurances that the Work when resumed will be conducted in a safe manner. Work stoppages ordered pursuant to this paragraph shall not entitle Seller to any additional compensation or extension of the Contract Time. The provisions of this subsection 28.2 shall in no way be construed to place an obligation or responsibility upon the Owner for the safety of the Seller's employees or the Seller's Subcontractors employees or compliance with OSHA or other applicable safety standards, rules and regulations by the Seller or its Subcontractors.

29.0 COMPLETION OF WORK

29.1 MILESTONE DELIVERY AND PERFORMANCE DATES

Any Milestone Events which have associated therewith times for the delivery by Seller of the Goods, Equipment, Equipment Installation, and Deliverable Documents under this Contract, shall be as set forth in the Special Conditions.

29.2 SITE PREPARATION AND MECHANICAL COMPLETION

Prior to the scheduled date of equipment delivery to the Project Site, The Owner shall have substantially completed the work identified in the Owner's Site and Facility Design Drawings and Specifications to the extent which allows the ready installation of the Seller's equipment.

The mechanical completion of the Plant shall be completed by Seller. Mechanical completion shall include the following:

(a) the complete physical installation and construction of the Equipment in the plant, including subsystems, and connection of the same to related supporting utilities which shall be finished by Owner to the extent that such is contained on the Owner's Site and Facility Design Drawings. The installation shall be in compliance with the Specifications, and all applicable Codes and Standards, and applicable industry standards; and

(b) the Equipment shall be installed to a state of readiness to begin all preparational checkouts such as flushes, hydrostatic and pneumatic pressure tests, electrical continuity tests, mechanical tests, and calibration as described in the "PRECOMMISSIONING" requirements set forth herein below.

29.3 PRECOMMISSIONING

The Seller is responsible for precommissioning activities, including all pre-operational checkouts such as flushes, hydrostatic and pneumatic pressure tests, electrical continuity tests, mechanical tests, and calibration in readiness for the start of Commissioning testing by the Seller.

PRECOMMISSIONING shall consist of the following:

(a) all systems and equipment shall be tested mechanically and hydrostatically so as to confirm the tightness and freedom from leaks;

(b) all systems shall be cleaned, purged internally to permit operation without fouling and/or damaging mechanical equipment or adulterating the process fluids;

(c) all mechanical equipment, instruments, control panels, electrical equipment and lifting and handling equipment including auxiliaries and control systems, shall be serviced, adjusted, calibrated, and set for normal operation.

29.4 COMMISSIONING

The Startup and Commissioning activities shall be performed by Seller's Technical Services personnel, with assistance of Owner's operating personnel. Startup and commissioning activities shall include the following:

(a) all equipment and systems shall be purged and pressurized with air, water and/or other relevant material;

(b) process materials shall be introduced into the facilities at sustained flow conditions;

(c) all rotating machinery, such as pumps, fans, compressors, electric motors, engine, etc, and auxiliary systems shall be load tested on manual and automatic control at full operating conditions with fluid in the systems;

(d) all instruments and control panels shall be tested for control/alarm functions at minimum, normal, and maximum operating conditions with process fluids in the systems;

(e) all shutdown, relief and emergency systems shall be tested for proper functioning at the set values in the course of a complete system test;

(f) the respective vendor manuals including operating and maintenance manuals for which Seller is responsible shall be completed and submitted by Seller to Owner.

29.5 INITIAL OPERATION

The Initial Operation shall have the prior approval of Seller, and shall be performed by Owner under the direction of Seller. Initial Operation activities shall begin after all tests required under Precommissioning and Commissioning have been completed successfully. Initial Operation shall consist of the operation of all mechanical and electrical systems to achieve stable process operation.

29.6 ACCEPTANCE TEST

After completion of Initial Operation, the Project shall be operated continuously for a minimum of fourteen (14) days prior to conducting the Acceptance Test. The process Acceptance Test shall be performed to ascertain whether or not the Project meets the applicable Performance Guarantee requirements. Owner shall reasonably cooperate with Seller in setting up and carrying out the Acceptance Test as soon as reasonably practical after the initial 14 day operational period. Performance Guarantees shall be as set forth in the Special Conditions.

29.7 PROVISION OF SUPPLIES AND EQUIPMENT

Except to the extent otherwise specified in the Contract Documents, Owner shall furnish or cause to be furnished, and shall assume full responsibility for obtaining, all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, heat, light, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the Initial Operation, and Acceptance Testing.

Seller shall assume full responsibility for providing material (except leachate), equipment, labor, tools, and other facilities and incidentals necessary for the Precommissioning and Commissioning of the Plant. Owner shall furnish required utilities in this regard.

29.8 COMPLETION LIST

Fourteen days prior to conducting Acceptance Tests (unless otherwise mutually agreed, Seller shall provide to Owner a list of all unperformed Work, or work requiring repair or rework, which is required to be performed by Seller and/or Owner, depending upon the specific responsibilities as assigned in the Contract Documents, to place the Equipment and the Work in compliance with the requirements of the Contract Documents, including:

(a) minor omissions;
(b) minor defects;
(c) items which are otherwise not in compliance with the requirements of this Contract.

29.9 FINAL ACCEPTANCE OF THE WORK UNDER THIS CONTRACT

Final Acceptance under this Contract shall occur when the Work conforms to all the obligations under the Contract Documents, including (1) supply of Deliverable Documents; (2) the Plant has successfully passed the Acceptance Test by meeting 100 percent of the Process Performance Guarantees; (3) Seller has completed all

Completion List items to conform to the Contract Documents;(4) Seller has delivered to Owner a final waiver and release of lien; (5) Seller has satisfied all of Seller's obligations under this Contract other than warranty obligations.

As the Equipment (or portions of the Equipment or the Work as may be mutually agreed) are being tested and Commissioned, the Seller shall notify Owner of the anticipated date of completion of its activities on the Completion List as necessary for issuance of the "Certificate of Final Acceptance of the Work." Such notice by Seller to Owner shall include a summary of the Work which has not been performed by the date of the Notice, if any, and shall describe the Seller's plans for performing such work, if required. Within ten (10) working days after receiving Seller's notice, Owner shall either:

(a) issue to Seller a Certificate of Final Acceptance; or
(b) notify Seller of the specific matters and things which are reasonably required to be done in order to reach the stage of Final Acceptance.

In the latter case, upon Seller's completion of such unperformed Work, Seller shall notify Owner within five (5) working days. If Owner then finds that such work has been properly performed, then Owner shall deliver to Seller the "Certificate of Final Acceptance of the Work".

30.0 FINAL PAYMENT

Within forty-five (45)days after the date of Final Acceptance, the Owner shall pay Seller all sums then due, including all retention.

31.0 WARRANTIES, CORRECTION PERIOD

31.1 Seller warrants and guarantees that the Goods and Equipment shall be free from defects in material and workmanship, and shall conform in all respects to the requirements of the Contract Documents including but not limited to the Process Performance Guarantees, and shall be new and of the kind and quality specified in the Contract Documents.

31.2 The warranty set forth in Clause 31.1 shall apply for a period of eighteen (18) months from delivery of Equipment, or for one (1) year from Initial Operation of the Equipment, whichever shall first occur.

31.3 Seller warrants and guarantees that the Equipment shall provide the performance as set forth in the Process Performance Guarantee, as set forth in the Special Conditions Section 12.1. The Acceptance Test shall be deemed to have been met by successfully demonstrating compliance with the Performance Guarantees. At the Owner's option and expense, an additional test to determine the if the Project meets the Performance

Guarantees shall be conducted within 30 days following the Acceptance of the Project. If the Performance Guarantees are not met, then the Seller, at his expense, shall make such repairs or replace such equipment to enable the Project to meet the Performance Guarantees. If the Seller is required to perform repairs or replace equipment following this additional test, the Project shall be retested at the Seller's expense to demonstrate the equipment repairs and/or replacement were sufficient to result in the Project achieving the Performance Guarantees.

31.4 If within the above-provided warranty period, or any longer period provided by law, the Owner discovers any defect(s) in the Work or any part thereof, or any non-compliance or non-conformance with the Contract, then upon notice to Seller, Seller shall promptly correct the defective or non-compliant Work, or if reasonably rejected by Owner, remove it from the site and replace it with Work which is not defective and is compliant.

31.5 Seller shall not be liable under this Contract for ordinary wear and tear; corrosion or erosion, as a result of improper operation, improper maintenance, or operating conditions materially more severe than those identified in this Contract. THE WARRANTIES, LIABILITIES, AND RESPONSIBILITIES OF SELLER HEREIN AND THE RIGHTS AND REMEDIES OF OWNER HEREUNDER ARE EXCLUSIVE AND IN SUBSTITUTION FOR ALL OTHER WARRANTIES, OBLIGATION, AND REMEDIES, INCLUDING ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE, IMPLIED WARRANTY FROM COURSE OF DEALING, USAGE OR TRADE, OR ANY OBLIGATION OR LIABILITY OF SELLER ARISING FROM LOSS OF USE OR PRODUCTION, REVENUE, OR PROFIT, OR COSTS OF CAPITAL, OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

32.0 TITLE AND RISK OF LOSS

32.1 Title to all materials, equipment, drawings and documents supplied by Seller hereunder shall become the property of Owner upon full payment therefore or upon delivery, whichever occurs earlier. Notwithstanding the foregoing, Seller shall be responsible for and shall bear the risk of loss or damage to the Goods, Equipment, and Deliverable Documents until delivery thereof to the Project site. Upon such delivery, the risk of loss or damage shall pass to Owner; provided, however, that any loss or damage which results from Seller's nonconforming packaging, crating, unloading or installation shall be borne by Seller.

33.0 PROGRESS REPORTS

33.1 Seller shall transmit to Owner with a copy to Owner's Consultant a Monthly Progress Report for Seller.

34.0 PRICE AND PAYMENT

34.1 General

All funds paid to Seller as progress payments or otherwise pursuant to this Contract shall be paid on a net thirty (30) days basis, for Owner approved invoices, or for all undisputed portions thereof.

34.2 Overdue Payments

After a fifteen (15) day grace period, any Payment due and unpaid under the Contract shall bear interest from the date payment was due until the date payment is received by Seller, at the rate of twelve percent(12%) per annum, or at the maximum legal rate prevailing at the place of the Project, whichever is the lesser.

34.3 Retention

Ten (10) percent of the Fixed Price portion of each invoice amount shall be retained until Final Acceptance. No retention shall be held for the Cost Reimbursable Portion of the invoice. Invoices shall clearly delineate Fixed Price and Cost Reimbursable amounts.Retention shall be released to Seller upon completing delivery of Goods, Equipment, Deliverable Documents, installation of Equipment, and Final Acceptance.

35.0 AUDIT

35.1 For all Fixed Price work, Owner shall have the right to audit all documents, books, records or other evidence supporting any increase, above the fixed price, when such increase is requested by Seller.

35.2 For all cost-plus or Cost Reimbursable work, Seller shall maintain records, including but not limited to documents and other evidence pertaining to the cost of such services, to the extent and in such detail as will properly reflect all costs and expense of whatever nature for reimbursement is claimed under the provisions of this Contract. Upon request of Owner, Seller shall make available, at the Seller's offices, any and all such records, along with any related correspondence, receipts, vouchers, or memoranda pertaining to this Contract for inspection, audit, or reproduction by an authorized representative of Owner.

35.3 Seller shall preserve all relevant records for a period of two (2) years after Final Acceptance hereunder during which period Owner shall complete any audit that it deems appropriate. Should discrepancies or questions arise during this period, upon notice from Owner, Seller shall preserve all records until agreement is reached.

36.0 EQUAL EMPLOYMENT OPPORTUNITY

36.1 The Seller shall not discriminate against any employee or applicant for employment because of race, creed, color, sex, age or national origin. Seller shall take affirmative action to ensure that applicants are employed, and the employees are treated during employment without regard to their race, creed, color, sex, age or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rate of pay or other forms of compensation; and selection for training, including apprenticeship. Seller agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this clause.

36.2 Seller shall, in all solicitations or advertisements for employees placed by or on behalf of Seller, state that all qualified applicants will receive consideration or employment without regard to race, creed, sex, age or national origin.

36.3 Seller shall comply with all provisions of Executive Order No. 11246 of September 24, 1965, any amendments thereto, and the rules, regulations, and relevant orders of the Secretary of Labor.

36.4 Seller shall furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, any amendments thereto, and by the rules and regulations, and relevant orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

36.5 In the event of Seller noncompliance with the foregoing provisions of this Paragraph or with any of the said rules, regulations or orders, this Contract may be cancelled, terminated or suspended in whole or in part.

36.6 Seller shall include the substance of this Paragraph in every Lower Tier Contract for the performance of the Work, unless exempted by rules, regulations or order of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that the terms of this Paragraph will be binding upon each such Lower Tier Subcontractor.

37.0 SUBMITTALS AND APPROVALS - DRAWINGS AND DATA

37.1 Drawings are those drawings, calculations, diagrams, schedules, and other data or information specifically prepared for the Work to illustrate some portion of the Work

and which are required to be supplied by Seller to Owner under the Contract Documents.

37.2 Seller shall submit to Owner, with reasonable promptness and in such sequence as to cause no delay to the progress of the Work, Drawings as otherwise required by the Contract Documents. Seller shall submit three (3) prints of all Drawings, and three (3) copies of all other materials, unless otherwise specified in the Special Conditions.

37.3 Owner's review and approval of any Drawings shall not relieve Seller from responsibility for any deviation or variation from the requirements of the Contract Documents, unless Seller has in writing expressly called Owner's attention to each such deviation or variation at the time of submission, and Owner has given its written approval of each such variation by written notation thereof on the Drawing or otherwise. The Seller shall not be relieved of any responsibility for errors or omissions in any Drawings by the Owner's approval thereof. Seller acknowledges that Owner's review of Drawings is for conformance with the design concept and the information given in the Contract Documents only, and is not intended as a complete or exhaustive detail check, which is the responsibility of Seller.

37.4 Where submission and approval of a Drawing is required, any related Work performed prior to Owner's review and approval of the pertinent Drawings shall be at the expense and responsibility of Seller, unless delay by Owner beyond the time for approval set forth in the Special Conditions impacts Seller's ability to timely or cost effectively obtain production of such Goods or Equipment.

37.5 Following review by Owner, one print or copy of Shop Drawings shall be returned to Seller with Owner's comments noted thereon. Any comments by Owner shall be incorporated into revised Drawings and two (2) revised, clean drawings shall be transmitted to Owner. If acceptable to Owner, one (1) drawing shall be returned to Seller marked, if applicable, "Released for Fabrication."

38.0 QUALITY ASSURANCE AND QUALITY CONTROL

38.1 Seller shall provide for Owner review, within ten (10) working days after receipt of a Notice to Proceed, a Quality Assurance program in adequate detail to assure that the construction quality requirements set forth in the Contract Documents are attained for the Work.

38.2 Owner efforts related to quality assurance and quality control shall not relieve Seller of any of its responsibilities under the Contract Documents.

39.0 NOTICE

Whenever any provision of the Contract Documents requires the giving of any notice, it shall be made in writing, and given by sending the same by (a) personal delivery, or (b) by courier service, (c) by U.S. mail, postage prepaid, return receipt requested, or (d) by fax, provided receipt of same is promptly confirmed with an original, and such notice shall be deemed effective upon actual receipt, as evidenced by the delivery receipt or return receipt postcard, if not personally delivered. Notices shall be sent to the following addresses:

If to SELLER:

Resources Conservation Company
3006 Northup Way
Bellevue, Washington 98004-1407
Attention: President

Telephone: 206-828-2400
Facsimile: 206-828-0526

If to OWNER: As set forth in the Special Conditions.

40.0 NON-WAIVER; RIGHTS AND REMEDIES PRESERVED

40.1 No action or failure to act by Owner or by Seller or by any of their agents, employees, or representatives shall constitute a waiver of any right afforded or obligation arising under the terms of the Contract Documents, nor shall any such action or failure to act constitute approval or acquiescence in any breach of this Contract or non-compliance with the terms of the Contract Documents, except as may be specifically agreed to in writing by the parties.

40.2 The duties and obligations imposed by the Contract Documents and the rights and remedies available hereunder to the parties hereto, are in addition to, and are not to be construed in any way, except in conformance with their terms, as a limitation of any rights and remedies that are otherwise imposed or available by law or in equity. Each party reserves the right to exercise any right or remedy available to it either separately or concurrently with any other right or remedy available to it.

41.0 APPLICABLE LAW; SEVERABILITY

41.1 Unless otherwise provided, this Contract shall be governed by the laws of the State wherein the Project is located, excluding its conflicts of laws rules, but including any applicable provisions of Federal law.

41.2 If any portion of this Contract shall be found unenforceable as a matter of law, the remainder of this Contract shall be enforceable without such portion.

--- END OF GENERAL CONDITIONS ---

SPECIAL CONDITIONS

FOR

THE SUPPLY AND INSTALLATION OF EQUIPMENT

AND TECHNICAL SERVICES

FOR

LEACHATE WASTEWATER TREATMENT PLANT

IN

PASCO COUNTY, FLORIDA

TABLE OF CONTENTS

SC-1 INDEMNIFICATION - FLORIDA

Seller acknowledges and agrees that the Contract Price includes the sum of One Thousand Dollars ($1,000) as good, separate, and specific consideration from Owner for the indemnification obligation undertaken by Seller under Clause GC-15. Seller accordingly waives and releases any rights or benefits may have under Florida Statutes Section 725.06, and acknowledges and agrees that its indemnification obligation under that Clause is intended to be fully enforceable.

SC-2 NOTICE

In accord with Clause GC-39 of the General Conditions, the Owner's address to which all Notices shall be directed is as follows:

Pasco County, Florida
Public Works Utilities Complex
Suite 205
7530 Little Road
New Port Richey, Florida 34654

Attention: Doug Bramlett
Assistant County Administrator
Utilities Department

Telephone: 813-847-8145
Facsimile: 813-847-8064

SC-3 TAXES

3.1 Sales, Transaction Privilege, Use and Excise Taxes

Subject to the terms of this Clause SC-3, Owner shall pay any and all applicable sales, use, excise or similar taxes imposed by Federal, state, municipal, or other local authority upon any Work or Equipment purchased by Owner hereunder and shall promptly reimburse Seller for all such taxes required to be paid by Seller, except the Owner shall not be obligated to pay, and shall promptly be reimbursed by Seller if the Owner does pay, any additional amounts of the above specified kinds of taxes levied or assessed against Seller or the Owner by reason of any failure of Seller to comply with the provisions of the Contract which results, or is alleged by applicable taxing authorities to result, in the passage of title to the Equipment at a point or time other than as specified in this Contract.

3.2 Florida Sales Tax

Owner may certify that certain materials, supplies, Goods, Equipment, Deliverable Documents, or other items of tangible personal property intended to be incorporated into the Work which is the subject matter of this Contract, or used by Seller or any of its Subcontractors in connection with the Work, are exempt from Florida Sales and/or Use Taxes under the provisions of Florida Statutes, the laws and ordinances of local taxing authorities (hereinafter referred to as "Exempt Materials"). In the event Owner certifies that all or a portion of this Contract is exempt from sales and/or Use Taxes under the provisions of Florida Statutes, Seller shall not bill such taxes to Owner.

3.3 Claims for and Billing of Taxes

All Federal, state or local taxes to be paid or reimbursed by Owner shall be separately stated in the Sellers invoice. In the event Owner shall object to any claim by Seller for taxes invoiced to Owner, or in the event Seller shall be notified by any taxing authority against Seller for the payment of such tax (or any additional or increased tax) for which Seller is entitled to reimbursement under this Section, Seller shall promptly consult with Owner to advise Owner fully regarding the nature of such claim and the stated reasons supporting it.

3.4 Owner shall have the exclusive right to determine whether or not and on what grounds any claim of such taxing authority shall be resisted by Seller. Seller shall take such interim steps as may be necessary to avoid prejudicing the right of either Seller or Owner, or both, to resist any such claim. Seller shall keep Owner promptly and fully advised concerning any such interim steps as may be so taken. At the request of Owner, Seller shall (a) subrogate Owner to all rights which Seller may have with respect to any action proceeding relating to such taxes, or (b) permit Owner to control the manner of resisting, in contractor's name, claims, or actions for refund and interest arising out of allegedly unlawful or improper assessment, levy or collection of such taxes. Seller shall cooperate fully, at Owner's expense (whether in Owner's or Seller's name) in any suit or claim for refund or other proceeding for the recovery of such taxes.

SC-4 BONDS

4.1 The Seller shall furnish a Combined Performance and Payment Bond as security for the faithful performance and payment of all its obligations under the Contract Documents. The bond shall be in an amount at least equal to the Contract Price, which shall be calculated as the sum of the FIXED PRICE amount plus the estimated COST REIMBURSABLE amount, as stated in Document No. 5, the Seller's Conformed Proposal. Bonds shall be executed on

the forms included in the Contract Documents and with such sureties as are licensed to conduct business in the State of Florida. The surety shall have an "A" minimum rating of performance and shall have a current Certificate of Authority issued by the United States Department of Treasury. Each bond shall be accompanied by a "Power of Attorney" authorizing the attorney-in-fact to bind the surety and certified to include the date of the bond. The surety company shall also be in full compliance with the provisions of the Florida Administrative Code and the surety company shall have at least twice the minimum surplus and capital required by the Florida Insurance Code at the time the Notice to Proceed is issued by the Owner.

4.2 If the surety on any bond furnished by Seller is declared bankrupt or becomes insolvent or its right to do business is revoked in any state where any part of the project is located, Seller shall within five (5) Days thereafter substitute another bond and surety, both of which shall be acceptable to Owner. All alterations, extensions of time, extra and additional Work, and other changes authorized by the Contract Documents may be made without securing the consent of the sureties on the Contract bonds; and the bonds shall so provide.

The Combined Performance and Payment Bond shall continue in full force and effect until the expiration of any and all liens or twelve (12) months following Acceptance of the Project whichever is later.

SC-5 PROPRIETARY INFORMATION

Performance of this Agreement requires Seller to disclose data and information to owner, or to Owner's Engineer or to Owner's other Contractors, some of which will be Seller's proprietary data, information and know-how. Such proprietary data, information, and know-how shall be clearly identified and appropriately marked "PROPRIETARY" or "RCC PROPRIETARY INFORMATION" at the time of disclosure. Except where Owner is required to divulge information to the public under the freedom of information laws in Florida, Owner agrees (a) to hold in trust and maintain confidential, (b) not to disclose to others without proper written approval by Seller, and (c) not to use for other than the purpose of building and operating the Project without license from Seller, any such information received directly or indirectly from Seller hereunder, which Owner previously acquired, or which Owner acquires from its onsite work. These obligations apply to information supplied directly or indirectly, including that supplied in writing, in the form of drawings, orally, in the form of materials tested, and that acquired by observation.

The foregoing obligations of confidence, nondisclosure, and nonuse shall be binding for a period of 20 years from the date of this Agreement, except however, they shall not apply to any information included in such disclosure to the extent that Owner can show by written record or documentation that:

a. such information was in Owner's possession prior to its receipt from Seller and was not obtained directly or indirectly from Seller; and

b. such information is or becomes knowledge generally available to the public other than by acts or omission of Owner in violation of this Agreement; and

c. such information is subsequently received on a nonconfidential basis from a third party who has an independent right to such information and who did not receive it directly or indirectly from Seller.

Specific information disclosed shall not be deemed to come under the above exceptions merely because it is embraced by more general information which is or becomes public knowledge or was in the prior possession of Owner, but shall be deemed to be within the exceptions set forth above only if a description of the combination and operation of such combination are in the public domain or in the possession of Owner.

Owner will limit access of the information to its officers and employees that reasonably require access to the information for the purposes set forth above.

In the event that any governmental authority having appropriate jurisdiction demands disclosure of Seller's Proprietary Information, or in the event Owner determines that it is obliged to make such disclosure under the applicable public disclosure laws in spite of any applicable protections for Seller's Proprietary Information under trade secret laws, Owner shall have the right to make such disclosure providing: (a) at least ten (10) business days in advance of such disclosure Owner advises Seller of Owner's intent to make such as disclosure, and (b) Owner shall not object to Seller working with the applicable governmental authority or taking other measures as appropriate in an attempt to secure confidential treatment of such information.

SC-6 ADAPTABILITY OF PLANS AND SPECIFICATIONS

All documents including designs, drawings, and specifications furnished by Seller pursuant to this Contract are not intended or represented to be suitable for reuse by Owner or others on enlargements or extensions of the Project or any other project but with the understanding that the foregoing information can be used for repair, rebuilding or maintenance of the Project covered by this Contract. Other reuse without specific written verification of adaption by Seller is not authorized by Seller and Owner shall indemnify and hold harmless Seller from all claims, damages, losses, and expenses including attorney's fees arising out of or resulting therefrom. Any such use by Owner shall require a written license from Seller, and any verification or adaption by Seller will entitle Seller to further compensation at rates to be agreed upon in advance of such verification or adaption.

SC-7 PAYMENT MILESTONES - FIXED PRICE PORTION

Subject to Section SC-10, payment less retention will be made upon satisfactory completion and Owner acceptance of the following activity milestones in percentages of the total Purchase Order Price:

MILESTONE	% OF FIXED PRICE
Delivery of PFD, P&ID and Electrical One-Line Drawings	15%
Purchase of Titanium Tubes, as evidenced by signed purchase order	20%
Delivery of Certified Drawings required for foundation design	15%
Delivery to Project site:	
Evaporator Skid	10%
Brine Concentrator vessel	10%
Spray Dryer vessel	10%
The above to be verified by signed delivery receipt	
Installation of all equipment, verified by visual observation	15%
Deliver O&M Manuals	5%

The OWNER shall retain an amount equal to ten (10) per cent of each invoice for Fixed Price milestones.

Final Acceptance: Upon completion and passage of Acceptance Test, release of retention.

SC-8 OWNER'S REVIEW AND APPROVAL OF COST REIMBURSABLE MATERIALS

For all COST REIMBURSABLE MATERIALS, the Seller shall obtain competitive bids (three sources, if feasible). Seller shall evaluate the bids obtained, make recommendations, and the same to Owner for review and approval within fifteen (15) working days of the date received by Owner.

SC-9 PAYMENT - COST REIMBURSABLE PORTION

Subject to Section SC-10, OWNER shall pay to SELLER the full and complete amounts paid by Seller for all reimbursable costs on a monthly basis, provided that the SELLER provides invoices or other documentation reasonably satisfactory to the

OWNER demonstrating that such costs have been incurred. Further, the SELLER shall identify and provide to the OWNER, a schedule indicating the estimated values of Reimbursable Costs and the respective project months in which they are expected to be incurred.

No retainage on cost reimbursable items shall be withheld by the OWNER.

SC-10 NOT-TO-EXCEED PAYMENT SCHEDULE

Notwithstanding the provisions of SC-7 and SC-9, the Seller shall not be entitled to apply for payment of a cumulative aggregate drawdown amount which exceeds two hundred-fifty thousand dollars ($250,000) prior to October 1, 1995.

SC-11 TECHNICAL SERVICE ADDITIONS AND DELETIONS

11.1 The following rates will apply for additions to and deletions from the Base Scope (PRICING) above for both RCC home office labor or for field service representative(s). The rates shall be inclusive of employee salaries and wages; fringe benefits; payroll taxes and insurance; general and administrative overheads, and profit:

For technical service representative's time spent providing technical assistance:

Time Period	Straight Time Hourly Rate	Overtime Hourly Rate
Monday through Friday:		
First (day) Shift (8 hrs/shift)	$ 79.50	$ 94.00
Second Shift (8 hrs/shift)	$ 79.50	$ 94.00
Third Shift (8 hrs/shift)	$ 79.50	$ 94.00
Standby Time	$ 79.50	$ 94.00
Saturdays, Sundays and Holidays:		
First (day) Shift (8 hrs/shift)	$ 94.00	$ 109.00
Second Shift (8 hrs/shift)	$ 94.00	$ 109.00
Third Shift (8 hrs/shift)	$ 94.00	$ 109.00
Standby Time	$ 94.00	$ 109.00

11.2 Each technical service representative's travel time and travel expense (roundtrip) for a scheduled and approved jobsite visit will be paid at cost plus a ten percent (10%) General and Administrative fee.

11.3 Each technical service representative's per diem expenses will be paid at cost plus a ten percent (10%) General and Administrative fee per calendar day on assignment.

11.4 The above prices for technical service representatives shall be valid and firm for all service work performed prior to Final Acceptance of the Work.

SC-12 WARRANTY

SELLER shall be responsible to OWNER for enforcing all warranties and guarantees from the suppliers of COST REIMBURSABLE MATERIALS which are defective, or which require further correction or rework or are not of suitable quality or condition, or which do not conform to the Contract Documents. All such warranties shall extend for a period of one year from Initial Operation of the Equipment, or eighteen (18) months ~~for~~ From delivery of Equipment, whichever shall first occur. SELLER shall require all such suppliers of COST REIMBURSABLE MATERIALS to provide the warranties as indicated above or otherwise required by the Contract Documents. The SELLER Warrants that the Equipment provided by Seller for the leachate treatment process provided will perform in accordance with the Process Performance Guarantees set forth in SC-12.1 below as established by successful passage of the Acceptance Test. The SELLER agrees to the conditions described below if the process fails to meet the performance requirements of SC-12.1.

If the leachate quality remains within the design basis described in SC-12.1, and the process fails to pass the Acceptance Test, the SELLER shall modify the system such that the Process Performance Guarantees shall be met, at no cost to the OWNER.

SC-12.1 Process Performance Guarantee

A. CAPACITY

The treatment process furnished by the SELLER shall treat 35,000 gallons of leachate per 24-hour day, producing a distillate quality not to exceed 10 parts per million (ppm) total dissolved solids, excluding volatiles and a dry by-product solid which shall be free flowing.

B. ENERGY UTILIZATION

The vapor compressor shall not consume more than 162 kilowatt hours of electricity per 1,000 gallons of leachate treated.

The spray dryer shall not consume more than 2.5 x ~~106~~ 10^6 BTU per hour of natural gas when operating at the name plate rating of the facility (35,000 GPD).

C. MOISTURE CONTENT OF DRY SOLID

The dry solid produced as a result of the treatment process shall have a moisture content not exceeding five (5) per cent by weight when sampled at the residue outlet of the spray dryer.

D. DESIGN BASIS FEEDWATER LEACHATE

The leachate treatment process furnished by the SELLER is guaranteed to meet the above Performance Guarantees provided that the constituents and their respective concentrations, listed below[1] are not materially varied in the leachate feedwater chemistry.

CONSTITUENT	CONCENTRATION
Calcium, mg/l	7,000
Sodium, mg/l	5,165
Bicarbonate, mg/l	161
Sulfate, mg/l	177
Chloride, mg/l	20,163
Silica as SiO_2, mg/l	20
Total Dissolved Solids, mg/l	32,468
Temperature, °F	60
Design Flow, gpm	24.3
pH	6.5-7.5

1 Temperature may vary above that listed above, pH must be adjusted to be within the above range.

SC-13 SPARE PARTS

Seller shall provide at Owner's option and expense spare (on an F.O.B. Project site basis) parts at prices indicated in the Recommended Spare Parts lists to be submitted by Seller. The Recommended Spare Parts list and associated conformed proposal pricing is contained in Document 5, the Seller's Conformed Proposal.

SC-14 ATTORNEY'S FEES

In the event it becomes necessary for either party to employ an attorney to enforce compliance with the terms and conditions of this Contract, said party, if successful in enforcing its rights, shall be entitled to reimbursement from the other party for reasonable attorney's fees, and costs and expenses incurred in such enforcement.

SC-15 SURVIVAL OF TERMS

The provisions of Non-Waiver GC-40.0, and Proprietary Information SC-5, shall survive the termination, cancellation, or expiration of this Agreement.

DOCUMENT NO. 4

OWNER's SITE AND FACILITY DESIGN

DRAWINGS AND SPECIFICATIONS

TO BE PROVIDED LATER

NOT AVAILABLE AS OF 04/27/95

DOCUMENT NO. 5

SELLERS CONFORMED PROPOSAL

ionics

RCC Resources Conservation Company

3006 Northup Way
Bellevue, WA 98004-1407

Phone: 206 828-2400
Fax: 206 828-0525

A Division of Ionics, Incorporated

March 20, 1995
RCC Proposal No. 94-2168B

Mr. Doug Bramlett
Pasco County Assistant Administrator
7536 State Street
New Port Richey, FL 34654

Subject: Revised Proposal for the Pasco County Leachate Management System

Dear Mr. Bramlett:

Resources Conservation Company (RCC) is pleased to provide a revised proposal for the Pasco County Leachate Management System. The proposal offers a 35,000 gpd system which includes a Model 30T Brine Concentrator and spray dryer, and incorporates erection/installation by RCC.

We have included two versions of the proposal for your review, one with proprietary information and one with the proprietary information deleted and all proprietary stamps removed. We trust this information will be acceptable to the County while protecting RCC's interests.

We look forward to working with you on this important project. Please call me or Joe Bostjancic at (206) 828-2400 if you have any questions.

Very truly yours,

RESOURCES CONSERVATION COMPANY

Russell C. Vandenberg

Russell C. Vandenberg
President

Enclosure

JB/mls

Proposal to Supply a

LEACHATE MANAGEMENT SYSTEM

for

PASCO COUNTY
NEW PORT RICHEY, FLORIDA
RFQ NO. 94-091

and

CDM INC., TAMPA, FLORIDA
PASCO COUNTY ENGINEER

by

RESOURCES CONSERVATION COMPANY
BELLEVUE, WASHINGTON

MARCH 1995

RCC PROPOSAL NO. 94-2168B

Proposal to Supply a

LEACHATE MANAGEMENT SYSTEM

for

PASCO COUNTY
NEW PORT RICHEY, FLORIDA
RFQ No. 94-091

and

CDM INC., TAMPA, FLORIDA
PASCO COUNTY ENGINEER

by

RESOURCES CONSERVATION COMPANY
BELLEVUE, WASHINGTON

MARCH 1995

RCC PROPOSAL NO. 94-2168B

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1.0 INTRODUCTION

Resources Conservation Company (RCC) is pleased to provide this proposal to supply engineering design, procurement, equipment, delivery and installation of a Leachate Management System to Pasco County, Florida and CDM Inc., Pasco County Engineer as described herein. This proposal is submitted in response to Pasco County's RFQ No. 94-091, per the December 22, 1994 meeting with Pasco County and CDM at Pasco County facilities, and per subsequent telephone conversations and meetings.

RCC is an engineering company specializing in the design, construction, and startup of evaporation/drying systems and other unit process operations. Since 1974, when the first Brine Concentrator was commissioned, RCC has installed over 70 successful commercial systems using the seed-slurry process allowing clients to achieve zero discharge while recovering high quality water for recycle and reuse.

The system for Pasco County includes a Brine Concentrator (BC) which is modular or skid mounted to minimize construction time and expense. The BC is offered with a natural gas-fired spray dryer for dry solids salt production. The system will process 35,000 gallons per day of leachate being produced at Pasco County's Solid Waste Facility in Pasco County, Florida. The wastewater directed to the BC will be reduced in volume while producing high quality distillate and a highly concentrated waste stream. The waste stream will be directed to a spray dryer for production of a dry free-flowing solid material. Distillate will be recycled to the plant for high quality water use in boiler and cooling tower makeup.

2.0 SYSTEM DESIGN

2.1 System Description

RCC proposes to supply a Brine Concentrator (BC) and Spray Dryer System operating on leachate being produced at Pasco County's Solid Waste Facility in Pasco County, Florida. The wastewater directed to the BC will be reduced in volume while producing high quality distillate and a highly concentrated waste stream. The waste stream will be directed to a spray dryer for production of a dry free-flowing solid material. Distillate will be recycled to the plant for high quality water use.

2.2 Process Description

The design of the proposed system is based on the wastewater chemistry as identified by CDM correspondence dated March 22, 1994 and is shown in Figure 2-1. Leachate is transferred from a storage tank to the BC feed tank where sulfuric acid, sodium sulfate and scale inhibitor are added prior to being fed to the evaporator. The brine slurry from the evaporator flows to a spray dryer feed tank and on to a spray dryer where the brine is dried and collected for disposal. A *Preliminary Process Flow Diagram* is shown in Figure 2-2.

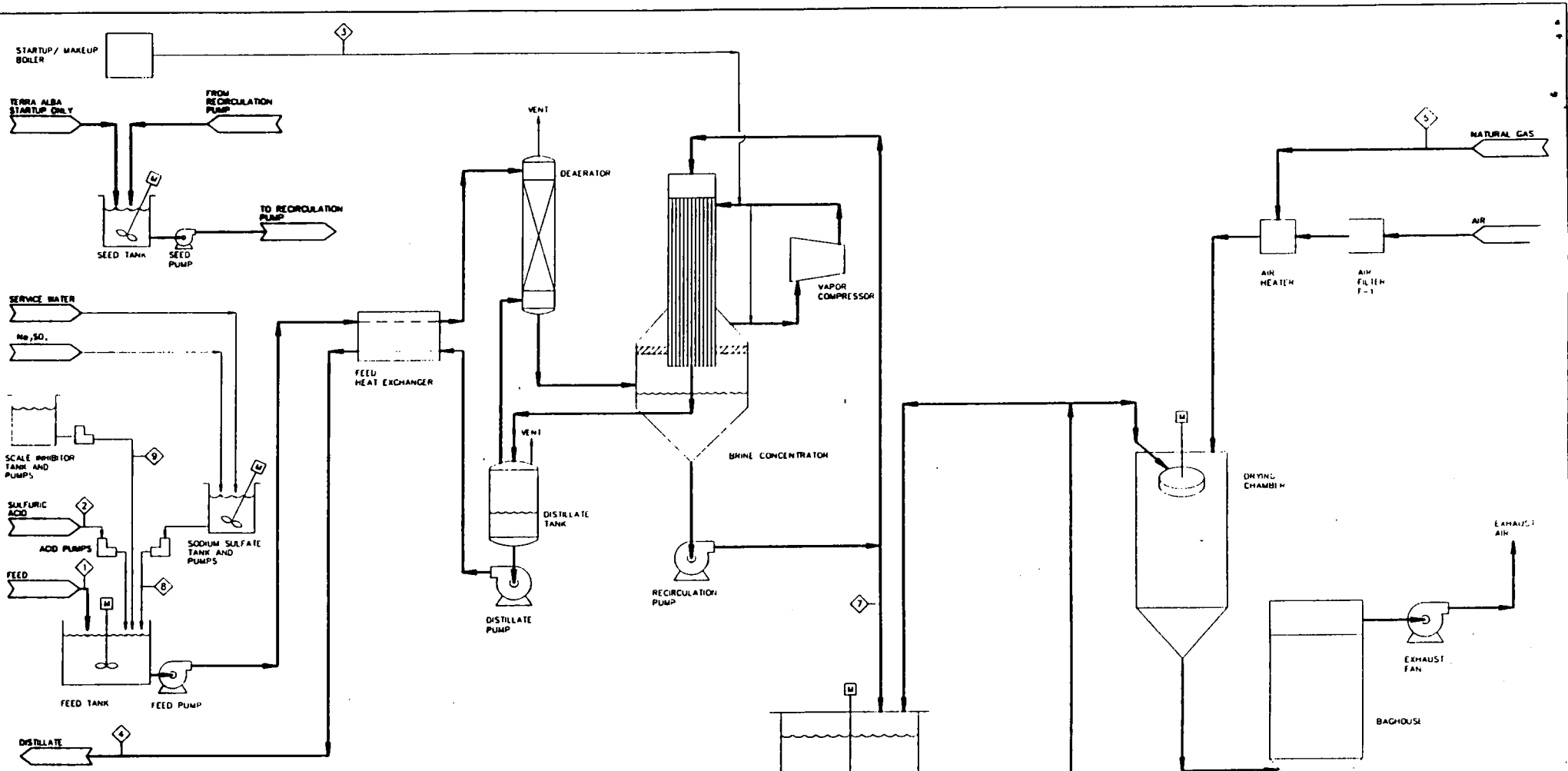
2.2.1 Brine Concentrator

The wastewater feed is pumped (by others) to the agitated feed tank where the pH is adjusted to 5-6 using sulfuric acid and sodium sulfate is added to facilitate seed slurry operation. Scale inhibitor is also added in the feed tank to prevent scaling in the front end heat exchanger and deaerator. The feed tank provides sufficient residence time for complete mixing. The feed is then pumped through the heat exchanger where it is heated to near boiling by recovering the distillate's sensible heat. The hot feed then passes through the deaerator where carbon dioxide (CO_2) and other non-condensibles are stripped before it enters the evaporator sump.

FIGURE 2-1
FEEDWATER CHEMISTRY [Note 1]
CDM/PASCO COUNTY, FLORIDA
RCC PROPOSAL NO. 94-2168B

CONSTITUENT	FEED CONCENTRATION
Calcium, mg/l	7,000
Sodium, mg/l	5,165
Bicarbonate, mg/l	161
Sulfate, mg/l	177
Chloride, mg/l	20,163
Silica as SiO_2, mg/l	20
Total Dissolved Solids, mg/l	32,468
Temperature, °F	60
Design Flow, gpm	24.3
pH	7

[1] Any deviation from the supplied chemistries above, including trace elements, may require system design modification.



STREAM	1 FEED	2 SULFURIC ACID	3 STEAM	4 DISTILLATE	5 NATURAL GAS	6 SOLIDS	7 B C WASTE	8 10% Na_2SO_4	9 SCALE INHIBITOR
FLOW	24.3 GPM								
TEMPERATURE	80° F								
NOTES									

FIGURE 2-2

LTR	REVISIONS	BY	CHK	APP	DATE

ENG RECORD	DRAWING STATUS		
JCV	ISSUED	DATE	

PRELIMINARY PROCESS FLOW DIAGRAM
PASCO COUNTY
BRINE CONCENTRATOR/SPRAY DRYER SYSTEM
CUSTOMER ORDER NO 94-2168B
RESOURCES CONSERVATION COMPANY

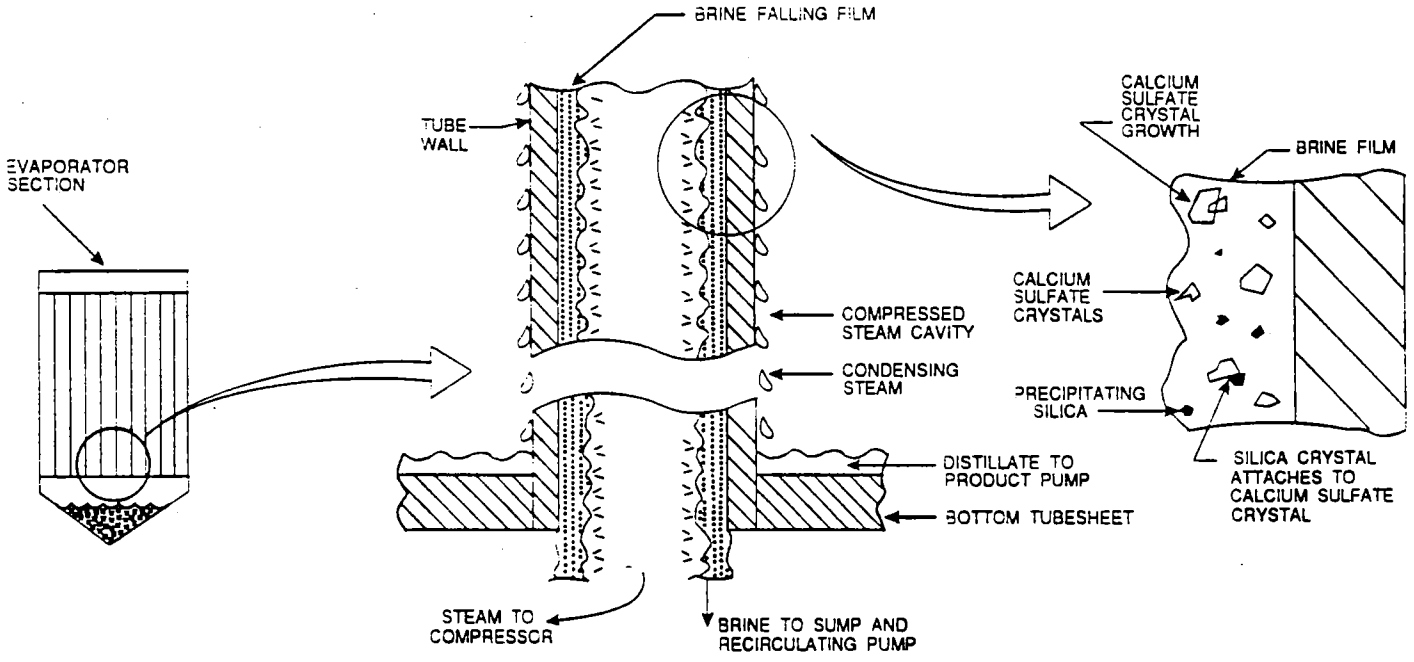
95-PD-2691
1 OF 1

The hot feed enters the floodbox at the top of the evaporator through a patented brine strainer for chip removal and prevention of plugging in the distributors. From there it is distributed evenly to the inside of the evaporator's vertical tubes using patented flow distributors to establish a thin uniform film on the tube's inside diameter. The steam exiting the tubes is collected above the sump level, passes through a mist eliminator, and into a vapor compressor where it is compressed to raise its temperature of condensation slightly above the boiling point of the brine on the inside of the tubes. The compressor discharge steam condenses on the outside of the tubes and is collected in a distillate tank. Distillate is then pumped to a storage tank (by others) for recycle or reuse within the plant.

Prior to the initial startup the fluid contents of the unit are "seeded" by the addition of calcium sulfate (gypsum). These circulating solids within the brine slurry serve as nucleation sites for subsequent calcium sulfate precipitation and crystal growth which occurs as the feed water is concentrated. This continued concentrating process and production of precipitated species creates a continuing source of new "seed" material as these particles are broken up by the mechanical agitation of the recirculation pump. As such, this seeding process is self-perpetrating and further addition is not required.

To avoid scale buildup in the evaporator, calcium sulfate seed crystals are continuously circulated over the wetted surfaces in the evaporator. Through control of design parameters such as slurry concentration, seed characteristics and system geometry, the evaporator can operate in this otherwise scale-forming environment. The thermochemical operation within the evaporator with regard to the scale prevention mechanism is depicted in Figure 2-3. As the water is evaporated from the brine film inside the tubes, the remaining brine film becomes super-saturated and calcium sulfate and silica start to precipitate. The precipitating material promotes crystal growth in the slurry rather than new nucleation that would deposit on the heat-transfer surfaces; the silica crystals attach themselves to the calcium sulfate crystals. This scale prevention mechanism, called preferential precipitation, has a proven capability to promote clean heat-transfer surfaces.

FIGURE 2-3



2.2.2 Spray Dryer System

Brine is delivered to the spray dryer feed tank from the BC. This tank is agitated by a mixer to keep solids suspended. Mixed solids are pumped to the atomizer in the drying chamber of the spray dryer. A natural gas-fueled air heater supplies heated air to the drying chamber. Brine is atomized and droplets are dehydrated as they fall to the bottom of the chamber. The resulting dried product solids are transferred to a bag house by means of air flow induced by an exhaust fan. The solids exit the bag house through a rotary valve and discharge directly for disposal.

2.3 System Control and Operation

2.3.1 Normal Operation

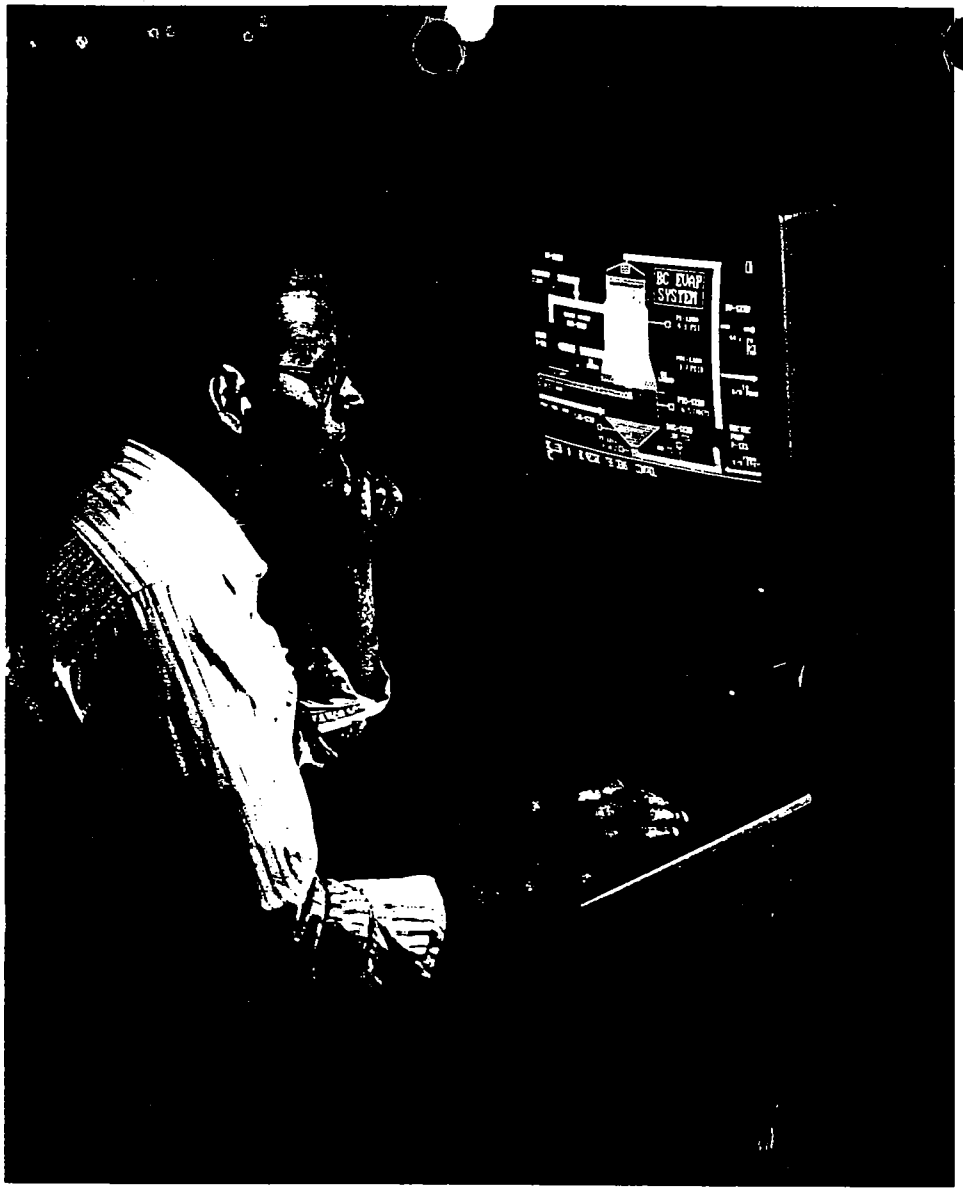
Appropriate instrumentation and controls are furnished to provide automatic control of the system and to minimize the requirement for operator attention. All control functions operate in a fail-safe mode, going to a safe and restartable mode upon loss of power. Additional controls provide equipment protection, indicate operating parameters, and initiate alarms in case of off-design conditions or malfunctions.

Indicators, controllers and associated equipment are displayed on and controlled from a CRT and keyboard at the operator interface. This arrangement enables an operator to supervise operation of the system, to determine the location and type of a malfunction, and to initiate corrective action.

The control system will consist of an Allen-Bradley PLC for control, connected to a CRT/keyboard for the operator interface (see Figure 2-4, *Color Graphic Control Systems).* The PLC will be programmed for all discrete and analog control with Allen-Bradley software running on an IBM PCAT compatible computer. The Video Control Panel will be programmed as the main operator interface with an IBM compatible keyboard. Program documentation will be furnished on floppy disks and A-B program documentation will also be annotated dot matrix printouts. The printer is included with the system. The equipment is furnished for installation in a control room atmosphere.

FIGURE 2-4

Color Graphic Control Systems



Desktop control station with 19" monitor.

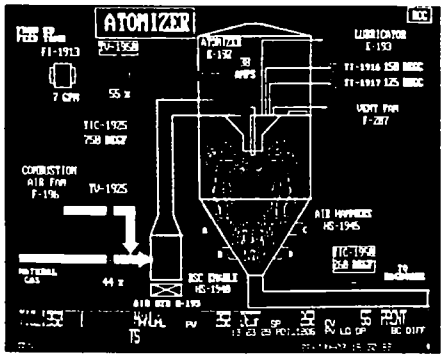
RCC designs low-cost, flexible distributed control systems for evaporators.

Using inexpensive programmable logic controllers (PLCs), standard IBM-compatible personal computers and off-the-shelf software, RCC designs distributed control systems more powerful than traditional consoles at half the cost.

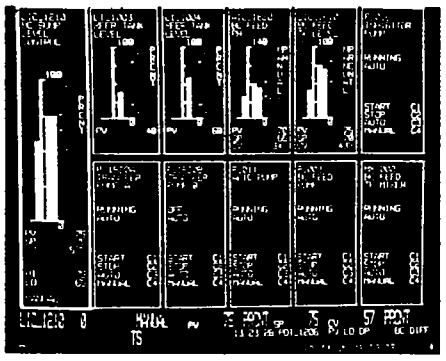
Animated color graphics create a comprehensive display of critical process data.

The advantages of RCC systems:

- ❑ Low cost
- ❑ Small size
- ❑ Simple operation
- ❑ Easy reconfiguration
- ❑ Automatic data logging
- ❑ One button start and stop
- ❑ Outdoor installation option
- ❑ Local and/or remote operation



Graphic display.



Faceplace display.

NEMA 4 outdoor control station.

RCC Resources Conservation Company

3006 Northup Way
Bellevue, Washington
98004-1407

Phone: 206 828-2400
Telex: 350166 RCC SEA
Fax: 206 828-0526

The following major automatic control loops are used:

- Evaporator Capacity

The evaporative capacity of the Brine Concentrator is controlled by manually setting the compressor bypass control valve. The automatic control loops for the evaporator system are designed to follow the compressor capacity adjustments and maintain stable system operation.

- Sump Liquid Level

The feed rate into the system is controlled by a control loop that senses the liquid level in the sump and sets the control valve on the feed to the sump.

- Feed Tank Level

The feed tank level is controlled by sensing the tank level and adjusting the position of the feed control valve.

- Distillate Tank Level

The distillate tank level is controlled by sensing the tank level and controlling the flow of distillate via a control valve.

- Deaerator Pressure

Deaerator pressure is maintained at a preset value by controlling the vapor flow from the distillate tank to the deaerator to assure proper temperature of the incoming feed and proper steam flow for efficient deaeration.

- Evaporator Pressure

The pressure is maintained at a preset point by controlling the vapor vent rate from the distillate tank, which is connected to the shell side of the evaporator. This pressure is controlled at 6 inches of water column.

- Waste Brine Discharge from Brine Concentrator

The waste discharge from the Brine Concentrator is controlled by periodically opening the waste valve. The open duration and the interval between openings is controlled by PLC programmed timers. The timers are set to maintain constant density in the sump, based on density measured within the brine sump. Wet lab samples are used to verify operation.

- pH Control

pH is controlled by feeding sulfuric acid with a metering pump whose output is determined by a pH sensor in the feed tank.

- Spray Dryer Feed Control

The feed rate is controlled to maintain a constant drying chamber discharge temperature. The feed rate is adjusted by increasing or decreasing the temperature of the inlet air.

2.3.2 Startup

Brine Concentrator startup from a cold condition is a straightforward sequence of manual operations. The sump is filled and recirculation initiated. Seed is manually added to the sump. Auxiliary steam is injected until operating temperature is reached and the system is maintained in this hot condition for approximately 24 hours to ensure meeting RCC seed-slurry requirements. The system is now ready for operation. The compressor is started, followed by the distillate

pump and the feed pump. Once the waste concentration reaches the desired level, waste discharge is started and, as the system stabilizes, all controls are switched to automatic mode.

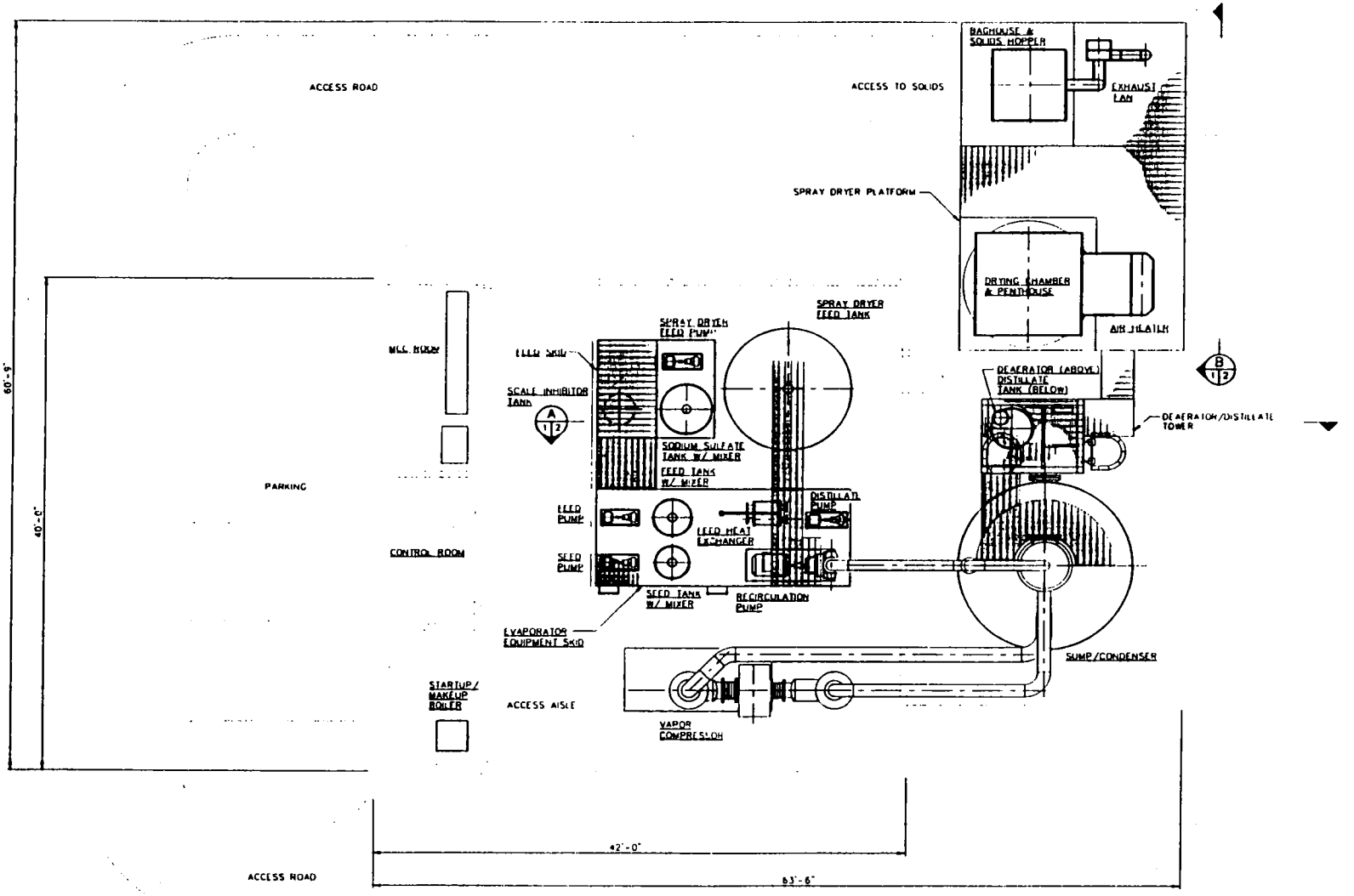
Startup from a "hot standby" condition involves turning the compressor on and activating the feed and distillate pumps. Once the feed and product flows are approximately balanced, the system is switched to the automatic mode and waste discharge is resumed. The time to restart from a hot standby is less than 10 minutes.

The spray dryer is put on line by activating the exhaust fan and igniting the gas burner to commence warm-up. The atomizer is turned on and service water is initially fed to the unit. The system is brought to operating temperature while increasing the feed rate and outlet air temperature. Once operating temperature is reached, the feed is switched over to brine and the outlet air temperature switched to automatic control.

2.3.3 Shutdown

Brine Concentrator shutdown is accomplished manually, or in the case of a malfunction, automatically. Shutdown actions include stopping the compressor and the feed and distillate pumps. This leaves the system in a "hot standby" condition in which the recirculation pump continues to run, keeping the system hot and ready to restart at any time. Deactivating the recirculation pump completes system shutdown and routine flushing and cleaning are accomplished.

To shut down the spray dryer the air temperature is simply switched to manual and the feed rate reduced to bring the outlet temperature to about 350°F. The feed is switched from brine to water. The dryer remains operating on water for about one minute following which the feed and burner are turned off. As the temperature reaches about 160°F the atomizer and exhaust fan are stopped.



PLAN VIEW

FIGURE 2-5

NO	REVISIONS	BY	CHK	APP	DATE	LTR

ENG RECORD	DRAWING STATUS		
ROTH	ISSUED	DATE	

PRELIMINARY GENERAL ARRANGEMENT
PASCO COUNTY
BRINE CONCENTRATOR/SPRAY DRYER SYSTEM
CUSTOMER ORDER NO 94-2168B
RESOURCES CONSERVATION COMPANY

95-PD-2697
1 OF 2

2.4 General Arrangement

A Preliminary General Arrangement is shown in Figure 2-5. The system includes several equipment skids which consist of a structural steel base, equipment set in place, piping, wiring and insulation installed. The condenser/sump assembly is provided in one unit and requires erection on site. The vapor compressor requires installation on a pad and erection of interconnecting duct work.

2.4.1 Evaporator Feed System

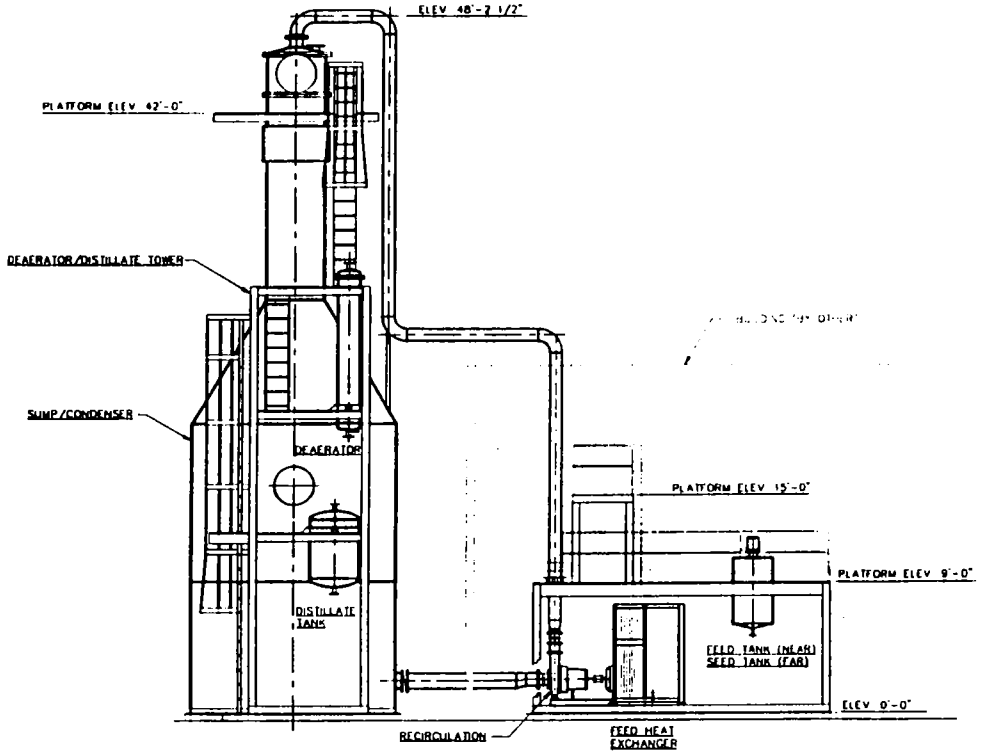
The evaporator feed system consists of the feed pump, feed tank and mixer, acid pump, sodium sulfate pumps and tank, scale inhibitor pumps and tank, and controls. Sulfuric acid, sodium sulfate and scale inhibitor are added to the feed tank and mixed prior to entering the feed pump for transfer to the evaporator sump.

2.4.3 Spray Dryer Feed Tank

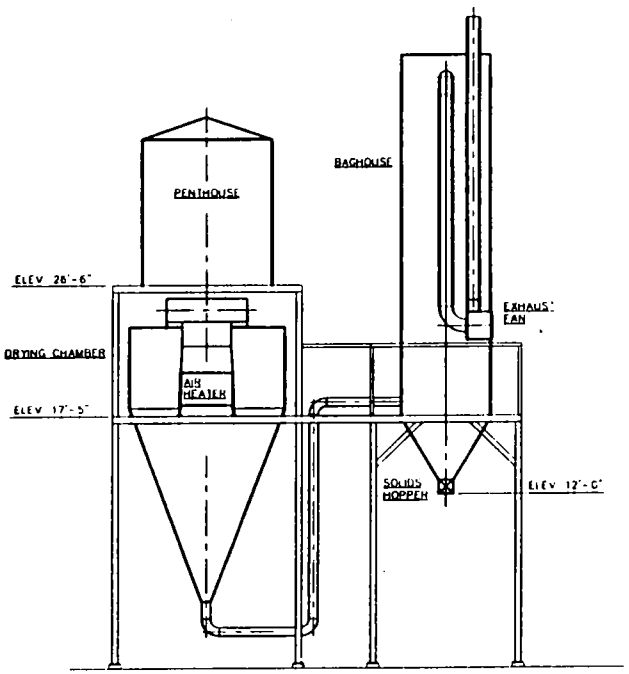
The spray dryer feed pump, tank and mixer are located adjacent to the evaporator vessel to allow transfer of slurry from the recirculation system to the tank and to provide surge capacity for the spray dryer. All piping and equipment locations require critical review for this slurry handling system.

2.4.4 Spray Dryer

The spray dryer consists of a drying chamber, air heater, baghouse, and exhaust fan. The dryer is equipped with a penthouse for access to the atomizer. The dryer will be furnished in two main modules to be connected together on site. The dryer solids will exit from the bag house through a rotary valve for disposal.



SECTION A 1/2



SECTION B 1/2

FIGURE 2-5 (CONTINUED)

REVISIONS	BY	CHK	APP	DATE	LTR	REVISIONS	BY	CHK	APP	DATE

ENG RECORD	DRAWING STATUS		
ROTH	ISSUED	DATE	

PRELIMINARY GENERAL ARRANGEMENT PASCO COUNTY	95-PD-2697
BRINE CONCENTRATOR/SPRAY DRYER SYSTEM	2
CUSTOMER ORDER NO 94-21688	
RESOURCES CONSERVATION COMPANY	

8 7 6 5 4 3 2 1

2.5 Equipment List

A *Preliminary Equipment List* is presented in Figure 2-6 and lists RCC proprietary and non-proprietary equipment items for the proposed Leachate Management System. The list may require change depending upon final design definition.

2.6 Design Specifications

The equipment and materials for the proposed Leachate Management System will be supplied in accordance with RCC standard and normal design practice. The design philosophy and equipment selection will be consistent with that employed in some 70 operating RCC systems around the world including several units in power generation facilities in Florida.

The following specifications are typical of those included in RCC's design approach:

AFBMA	Anti-Friction Manufacturers' Association
AGMA	American Gear Manufacturers' Association
AISC	American Institute of Steel Construction, Inc., 8th Ed.
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CSA	Canadian Standards Association
HIS	Hydraulic Institute Standards
IEEE	Institute of Electrical and Electronics Engineers
ISA	Instrument Society of America
NBC	National Building Code of Canada and Supplement to NBC, 1985 Ed.
NEMA	National Electrical Manufacturers' Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SAE	Society of Automotive Engineers

FIGURE 2-6
PRELIMINARY EQUIPMENT LIST
RCC PROPRIETARY EQUIPMENT SUPPLY
RCC PROPOSAL NO. 94-2168B

EQUIPMENT ITEM	QTY	DESCRIPTION OF EQUIPMENT	SUPPLIER (OR SIMILAR)
BRINE CONCENTRATOR			
Evaporator Floodbox Upper Tubesheet Lower Tubesheet Sump Brine Screen Tubes Distributors Mist Eliminator	1	Model 30T	RCC Design & Supply
Deaerator w/Packing	1	Atmospheric	RCC Design & Supply

FIGURE 2-6
PRELIMINARY EQUIPMENT LIST
RCC NON-PROPRIETARY EQUIPMENT SUPPLY
RCC PROPOSAL NO. 94-2168B

EQUIPMENT ITEM	QTY	DESCRIPTION OF EQUIPMENT	SUPPLIER (OR SIMILAR)
BRINE CONCENTRATOR			
Vapor Ducts w/Expansion Joints	1 set	Suction/Discharge	RCC Design & Supply
Recirculation Ducts w/Expansion Joints	1 set	Suction/Discharge	RCC Design & Supply
Heat Exchanger	1	Plate and frame	APV
Vapor Compressor	1	Positive displacement blower	Roots
Recirculation Pump & Motor	1	Centrifugal, 1,320 gpm, 30 HP	Goulds
Feed Pump & Motor	1	Centrifugal, 24.3 gpm, 5 HP	Goulds
Feed Tank	1	250 gallon	RCC Design & Supply
Feed Tank Mixer & Motor	1	0.5 HP	Burhans-Sharpe
Distillate Pump & Motor	1	Centrifugal, 22 gpm, 5 HP	Goulds
Distillate Tank	1	150 gallon	RCC Design & Supply
Seed Pump & Motor	1	Centrifugal, 50 gpm, 1 HP	Goulds
Seed Tank	1	250 gallon	RCC Design & Supply
Seed Tank Mixer & Motor	1	0.5 HP	Burhans-Sharpe

FIGURE 2-6
PRELIMINARY EQUIPMENT LIST
RCC NON-PROPRIETARY EQUIPMENT SUPPLY
RCC PROPOSAL NO. 94-2168B

EQUIPMENT ITEM	QTY	DESCRIPTION OF EQUIPMENT	SUPPLIER (OR SIMILAR)
Spray Dryer Feed Tank	1	8,000 gallon	RCC Design & Supply
Spray Dryer Feed Tank Mixer & Motor	1	1 HP	Burhans-Sharpe
Acid Pump & Motor	2	Metering, 2.64 gpd nominal, 0.5 HP	Milton-Roy
Scale Inhibitor Pump & Motor	2	Metering, 0.5 gpd nominal, 0.5 HP	Milton-Roy
Scale Inhibitor Tank	1	50 gallon	RCC Design & Supply
Sodium Sulfate Pump & Motor	2	Metering, 14 gph nominal, 0.5 HP	Milton-Roy
Sodium Sulfate Tank	1	400 gallon	RCC Design & Supply
Sodium Sulfate Mixer & Motor	1	0.5 HP	Burhans-Sharpe
Startup/Makeup Boiler	1	Natural gas-fired, 690 lb/hr @ 15 psig	Cleaver-Brooks
Motor Control Center	1	480V, 600 amp, main lugs only, NEMA 1 gasketed with FVNR starters (circuit breaker type), feeder circuit breakers, 480V/120V-208V transformer and panel board (control panel)	Allen Bradley
SPRAY DRYER EQUIPMENT			
Spray Dryer Feed Pump & Motor	1	Centrifugal, 25 gpm, 5 HP	Goulds

FIGURE 2-6
PRELIMINARY EQUIPMENT LIST
RCC NON-PROPRIETARY EQUIPMENT SUPPLY
RCC PROPOSAL NO. 94-2168B

EQUIPMENT ITEM	QTY	DESCRIPTION OF EQUIPMENT	SUPPLIER (OR SIMILAR)
Drying Chamber	1	Conical bottom	APV
Centrifugal Atomizer w/Hoist	1	20 HP, Hoist - 1 HP	APV
Air Heater & Filter	1	1,100 deg F. exit temperature	Maxon
Exhaust Fan	1	Centrifugal, 20 HP	APV
Baghouse	1	Pulse jet-type	Mikropul
Air Ducts	1 lot	As required	APV
Rotary Air Lock	1	1 HP	APV
MISCELLANEOUS EQUIPMENT			
Equipment Skids	1 lot	Includes: 1 tower skid, 2 equipment skids, ladders and access platforms	Chemithon
Field Instrumentation & Controls	1 lot	Various	Various
PLC Control System	1 lot	Includes control cabinet, CRT operator interface computer and ControlView	Allen-Bradley/IBM

Welding of fabricated equipment is performed per AWS procedures by AWS or ASME Section IX certified welders. Weld quality assurance and inspection will be the fabricator's normal practice in compliance with RCC standard specifications.

RCC supplies "off the shelf" TEFC electric motors as manufactured by Siemens, Reliance, General Electric or Toshiba. Brake horsepower, temperature rise, service factor, efficiency, power factor, insulation class and the like are taken into account in motor size selection. Materials of construction, coatings, bearings and winding insulation are all manufacturer's standard supply. Testing of motors is conducted in accordance with manufacturer's standards.

All process pumps are ANSI horizontal, end-suction, top-discharge, centrifugal types. Bearings are oil lubricated and mechanical seals are utilized where practical. The pumps are furnished complete with base, coupling with guard, and electric motor. Testing is conducted in accordance with supplier's standards. Typical manufacturers include Goulds, Worthington, ITT A-C and Durco.

All manufactured equipment including compressors, pumps, mixers, heat exchangers, instruments, controllers and motors supplied by RCC for the system will be manufacturer's standard product in compliance with RCC specifications. Purchased equipment such as the compressor, pumps, mixers, etc., will be supplied with manufacturer's standard paint. Fabricated vessels such as the evaporator condenser will be supplied with prime paint on carbon steel surfaces; stainless steel and FRP surfaces will be unpainted. Structural steel for supports and skids will be supplied with a finish coat application set by RCC standards.

Non-witnessed testing of manufacturers' equipment, when applicable, will be per RCC standard requirements. Reports of testing results will be available upon request.

2.7 Interfaces

The major flows, chemicals, power and other utilities required for the Brine Concentrator and Spray Dryer System described in this proposal are listed in the *Preliminary Interface List* in Figure 2-7.

FIGURE 2-7
PRELIMINARY INTERFACE LIST
CDM/PASCO COUNTY DISPOSAL
RCC PROPOSAL NO. 94-2168B

ITEM	QUANTITY/ CONDITIONS	PROVIDED BY
Feed Flowrate, gpm	24.3	Pasco County
Distillate Flowrate, gpm	Later	RCC
Service Water, gpm	Later	Pasco County
Instrument Air, scfm	Later	Pasco County
Sulfuric Acid (93 wt %), gpd	2.6	Pasco County
Sodium Sulfate (10%), gph	Later	Pasco County
Scale Inhibitor, gal/day	0.35	Pasco County
Startup Steam (@ 10 psig), lbs/hr [Note 1]	690	RCC
Natural Gas, MM BTU/Hr	Later	Pasco County
Solids, lb/hr	432	RCC
Electrical Power		
Installed, kW	294	Pasco County
Operating, kW	260	Pasco County

[1] Startup steam is required during cold startup only. Startup steam is not required during normal operation. Boiler requires 835 CFH or 0.83 MMBTU/hr.

2.8 Operation and Maintenance Manual

A preliminary Operation and Maintenance Manual outline is provided below for your information on the Brine Concentrator and Spray Dryer System. The manual includes a table and schematics of interlocks, trip points and set points. The manual is accompanied by a bound volume of vendor data catalogs, drawings and step-by-step maintenance procedures for all equipment used in the installation. This data is divided into sections of mechanical, electrical and instrumentation categories.

O & M Manual Outline:

Section 1.0 Introduction
Section 2.0 Description
Section 3.0 Service Systems Check
Section 4.0 Seeding the Brine Concentrator
Section 5.0 Brine Concentrator Startup
Section 6.0 Spray Dryer Startup and Operation (Optional)
Section 7.0 Concentrate Sump Brine
Section 8.0 Normal Operation
Section 9.0 Hot Standby
Section 10.0 Startup From Standby (Simplified)
Section 11.0 Total Shutdown and Cleanup
Section 12.0 Maintenance

3.0 SCOPE OF WORK

This section defines the work, equipment and services which will be provided by RCC and others in the implementation of the Brine Concentrator and Spray Dryer System for Pasco County as defined in this document.

3.1 RCC Scope of Supply

Provide equipment design and supply as follows:

- Perform process design and provide a Process Flow Diagram (PFD),
- Perform equipment design and provide a P&ID,
- Provide an electrical one line and wiring schematic diagrams,
- Provide general arrangement drawing,
- Provide foundation design criteria,
- Provide as-builts of the P&ID, Electrical One-Line and General Arrangement,
- Provide electrical/instrumentation interface data,
- Provide electrical installation including MCC, wiring and conduits/cable trays,
- Perform I&C design and supply and install PLC system cabinet,
- Specify, procure, deliver, erect and install the Brine Concentrator and spray dryer equipment listed in the *Preliminary Equipment List*, Figure 2-6,
- Design and supply access ladders and platforms,
- Design and provide interconnecting piping,
- Design and provide insulation,
- Provide painting of exposed carbon steel items including ladders and platforms,
- Provide proper pipe labeling,
- Provide system checkout, initial startup and training (including 160 manhours with any additional manhours supplied on a time and materials basis),

- Any additional requirements for engineering labor, equipment or installation which is required by the Owner's Site and Facility design drawings and specifications (Document No. 4) and which is additional to the above scope of supply shall be provided on a time and materials basis or a cost reimbursable basis as applicable,
- Provide and supply 5 copies of Operation and Maintenance Manuals.

3.2 Scope of Supply by Others

All work, equipment and services not provided by RCC as identified in Section 3.1 will be provided by others. This will include but not be limited to:

- Provide access to site including equipment laydown areas,
- Prepare site for system installation,
- Design and provide foundations, anchor bolts and all concrete work and grouting,
- Design and provide building with HVAC in control room and a ventilated electrical area,
- Provide and install electrical substation adjacent to building with underground wiring to MCC location within building,
- Provide area lighting, fire protection, building lighting and building HVAC as required,
- Provide underground electrical grounding system,
- Provide all electrical power, utility water, chemicals, instrument and utility air and other plant process required utilities,
- Provide operations personnel for checkout and initial startup,
- Apply for, obtain and pay for all permits,
- Pay all state and local taxes, fees and any penalties and interest thereon, including reimbursement to RCC if RCC is payer,
- All other items specifically not described as part of RCC's scope of work.

3.3 Clarifications

The following assumptions and clarifications are made regarding the above scope of work for the construction/installation portion of RCC's work on site:

- No paving, fences, roads, sidewalks, area drainage or landscaping is required,
- All overhead interference are relocated from the boundary limits and from the crane pathway to the laydown area,
- Crane service is available within 100 miles of the site,
- The laydown area is approximately 200' x 200' (min.) and located 500' from the boundary limits,
- Connections for supply water, feed, distillate, steam (70-150 psig), drainage and chemical supply interfaces are to be provided by others at the boundary limits,
- Owner to provide temporary water line sized for minimum 20 gpm,
- 480V and 4160V incoming power feeders are available and of sufficient capacity to feed equipment without using transformers (or Owner will provide transformers). Incoming power feeds are to be terminated at the MCC by Owner,
- Owner to provide 400 amp, 120/208V temporary power service at boundary limits for operating electric welding machines,
- The MCC is located within 200' of the vapor compressor.

4.0 SCHEDULE

Design engineering and equipment procurement work shall be completed to meet the following milestone dates:

MILESTONE EVENT	WEEKS FOLLOWING CONTRACT AWARD
1. P&ID, General Arrangement, Electrical One-Line. Package will include preliminary (N-T-E) footprints and loads	16
2. Deliver Brine Concentrator/spray dryer skid design and foundation design criteria	20
3. Deliver all equipment to the site	48
4. Deliver equipment parts lists, recommended spares and O&M manuals	48
5. Equipment installation/erection complete	66

5.0 COMMERCIAL

5.1 Price

This section provides pricing information for the supply of design, procurement, equipment and installation of the Leachate Management System as identified in this proposal. Pricing is offered in two parts; 1) a firm fixed price supply which includes RCC labor, proprietary design, proprietary equipment supply, installation design, overhead and technology fee, and 2) a cost estimate for the cost-reimbursable supply which includes the balance of equipment and installation for the system. Pricing excludes all sales and use taxes, permits, cost of obtaining permits, bonds and penalties and interest. All prices are based on RCC and selected sub-supplier standard designs and practices. Costs of changes to these standards resulting from Buyer review and approval are not included. ~~This offer remains valid for acceptance until April 26, 1995.~~

5.1.1 Firm Fixed Price Supply

Included in RCC's firm fixed price supply is the following labor and equipment:

- LABOR
  - Engineering Design
  - Installation Design
  - Project Management
  - Construction Management
  - Purchasing
  - Checkout, Startup and Training (160 hours)
  - Travel and Expenses
- PROPRIETARY EQUIPMENT
  - Condenser
  - Tubes
  - Tubesheets
  - Sump (Vapor Body)
  - Brine Strainer
  - Mist Eliminator
  - Distributors

- Deaerator
- Packing
- Freight on proprietary equipment

- TECHNOLOGY FEE

RCC offers the above scope of work at a firm fixed price of $1,274,000.00, F.O.B. Hudson, Florida.

5.1.2 Cost-Reimbursable Supply

All equipment (excluding the proprietary equipment listed in Section 5.1.1) freight, installation, and the performance and payment bond will be supplied on a cost reimbursable basis. The cost estimates for these items are included below:

Vapor Ducts w/Expansion Joints (1 set)	$ 23,000.00
Recirculation Ducts w/Expansion Joints (1 set)	47,000.00
Heat Exchanger	15,000.00
Vapor Compressor	81,100.00
Recirculation Pump & Motor	12,000.00
Feed Pump & Motor	2,500.00
Feed Tank	6,900.00
Feed Tank Mixer & Motor	1,000.00
Distillate Pump & Motor	2,500.00
Distillate Tank	5,100.00
Seed Pump & Motor	2,600.00
Seed Tank	6,000.00
Seed Tank Mixer & Motor	1,200.00
Spray Dryer Feed Tank	45,000.00
Spray Dryer Feed Tank Mixer & Motor	7,700.00
Acid Pump & Motor (2)	5,200.00
Scale Inhibitor Pump & Motor (2)	1,000.00
Scale Inhibitor Tank	1,000.00
Sodium Sulfate Pump & Motor (2)	5,600.00
Sodium Sulfate Tank	6,900.00
Sodium Sulfate Tank Mixer & Motor	2,000.00
Startup/Makeup Boiler	8,100.00
Spray Dryer Feed Pump & Motor	3,300.00
Spray Dryer Equipment	487,000.00
Equipment Skids	150,000.00

Field Instrumentation & Controls	60,000.00
PLC Control System	43,000.00
- Control Cabinet	
- CRT Operator Interface CPU	
- ControlView	
Motor Control Center	20,000.00
Freight on Cost-Reimbursable Equipment	42,000.00
Total Equipment & Freight Estimate	$ 1,093,700.00
Installation/Construction Estimate	625,000.00
Performance & Payment Bond Estimate	30,000.00
TOTAL ESTIMATED COST	$ 1,748,700.00

RCC offers to supply the above equipment, F.O.B. Hudson, Florida, freight, installation/construction, and a performance bond at cost. RCC will solicit bids and participate with CDM/Pasco County in equipment and construction contractor selection and award. Actual costs of equipment, including freight, installation/construction, and the performance bond will be passed on to Pasco County.

5.2 Technical Services

Beyond the 160 hours of technical assistance included in the firm fixed price supply for checkout, startup, training and performance testing, RCC will provide additional on-site services of a technical representative on a time and materials basis as requested at the following rates:

Standard Rate (8 hours per day, 5 days/week)	$ 79.50/hour
Overtime/Holiday Rate (over 8 hours/day or over 40 hours per week or weekend)	$ 94.00/hour

Subsistence, per diem, and travel will be billed at actual cost plus G&A of 10 percent.

5.3 Invoicing and Payment

5.3.1 Firm Fixed Price Supply

RCC proposes the following method of payment for the firm fixed price supply of this proposal which is based upon completion of the following milestone events:

MILESTONES	% OF FIXED PRICE
1. Delivery of PFD, P&ID and electrical one line drawings	15%
2. Purchase of titanium tubes as evidenced by signed purchase order	20%
3. Delivery of certified drawings required for foundation design	15%
4. Delivery of the following equipment to jobsite:	
a. Evaporator Skid	10%
b. Brine Concentrator Vessel	10%
c. Spray dryer vessel	10%
(The above equipment deliveries will be verified by signed delivery receipts.)	
5. Installation of all equipment verified by visual observation	15%
6. Deliver O&M Manuals	5%

5.3.2 Cost-Reimbursable Supply

Invoices will be submitted monthly to Pasco County to cover the cost-reimbursable scope of supply.

5.4 Spares

The following list of recommended spares are offered on a cost reimbursable basis:

EQUIPMENT ITEM	SPARES
Feed Heat Exchanger	Gaskets & Plates
PLC Spares	Power Supply, I/O Module
Tank Mixers	Seals & Bearings
Control Valves	Packing, Gaskets & Seals
	Repair Kits & Seats
Recirculation Pump	Bearings, Shaft Sleeve & Repair Kit
Distillate, Feed & Waste Pumps	Bearings, Shaft Sleeves & Maintenance Kits
Acid Pumps	Spare Parts Kit
pH Sensor & Transmitter	Sensor & Electronics
Expansion Joints	Replacements
Recirculation Isolation Valve	Seat, Disc & Shaft
Field Instruments	Transmitter & DP Cell Kits
	Rotameter Repair Kit
	Pressure Regulator Kit
Vortex Flowmeters	Gaskets, Sensor Assembly & Module Assembly
Vapor Compressor	Shims, Gaskets, Bearings & Repair Kit
Spray Dryer Atomizer	Spindle, Gaskets & Bearings
Spray Dryer Lubricator	Gaskets
Air Filters	Replacements
Burner	End Plates & X Section
Baghouse Collector	Bags (1 set), Gaskets, Valve, etc. Kit
Exhaust Fan	Bearings & Belt
Rotary Valve	Bearings & Packing
Atomizer & Vent Blower	Bearings, Gaskets, Impeller & Housing

The estimated cost for the above spares is $58,000.

6.0 PERFORMANCE GUARANTEES

6.1 Performance Guarantees Offered

The following performance guarantees are offered based on the feed chemistry as defined in Section 2.0:

- Capacity and Distillate Quality

  The treatment process furnished by the SELLER is warranted to treat 35,000 gallons of leachate per 24-hour day, producing a distillate quality not to exceed 10 parts per million (ppm) total dissolved solids, excluding volatiles and a dry by-product solid which shall be free flowing.

- Energy Utilization

  The vapor compressor shall not consume more than 162 kilowatt hours of electricity per 1,000 gallons of leachate treated.

  The spray dryer shall not consume more than 2.5×10^6 BTU per hour of natural gas when operating at the name plate rating of the facility (35,000 gpd).

- Moisture Content of Dry Solids

  The dry solid produced as a result of the treatment process shall have a moisture content not exceeding five (5) per cent by weight when sampled at the residue outlet of the spray dryer.

6.2 Acceptance Test

After system installation and checkout, the system shall be operated for 5 days following a 14 day initial operation period to test its conformance to specifications. The plant will be deemed to have passed the acceptance test when the following has been demonstrated:

- Feed processed to the evaporator at the rate stated in 6.1 above and will be measured over the entire 5 day period,
- The distillate quality, compressor energy and moisture content of solids stated in 6.1 above will be measured during a 48 hour period of continuous and trouble-free operation within the 5 day test.

6.3 Basis of Performance Guarantees

The above guarantees are based on the following:

~~- Any variation from the normal (design) feed chemistry shown in Figure 2-1 will require modification to these guarantees,~~

- A mutually agreed upon test plan between vendor and buyer prior to the acceptance test will be developed,
- Test shall be conducted with equipment in a commercially clean condition.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DISTRICT ROUTING SLIP

To: Bob Butera DATE: 4/4/97

CC To:

	PENSACOLA	**NORTHWEST DISTRICT**	
	Panama City	Northwest District Branch Office	
	Tallahassee	Northwest District Branch Office	
	Sopchoppy	Northwest District Satellite Office	
✓	**TAMPA**	**SOUTHWEST DISTRICT**	
	Punta Gorda	Southwest District Branch Office	
	Bartow	Southwest District Satellite Office	
	ORLANDO	**CENTRAL DISTRICT**	
	Melbourne	Central District Satellite Office	
	JACKSONVILLE	**NORTHEAST DISTRICT**	
	Gainesville	Northeast District Branch Office	
	FORT MYERS	**SOUTH DISTRICT**	
	Marathon	South District Branch Office	
	WEST PALM BEACH	**SOUTHEAST DISTRICT**	
	Port St. Lucie	Southeast District Branch Office	

RECEIVED
APR 04 1997
DEP

☐ Reply Optional Date Due _____ ☐ Reply Required Date Due: _____ ☑ Info Only

Comments:

Bob,
FYI

From: Jan Rae Clark Tel.: 921-9967

08-18-93

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

April 4, 1997

Mr. Mike Spann
Project Manager
Resource Conservation Company
3006 Northrup Way
Bellevue, WA 98004-1407

Dear Mr. Spann:

On March 28, 1997, we received your Application for Final Examination and Certification of resource recovery equipment at the Pasco County Resource Recovery Plant. We are proceeding to determine completeness of the application. Upon our determination of completeness, we will begin examination of the application.

Sincerely,

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

cc: Bob Butera ✓
Melton McKown
File

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

April 4, 1997

Mr. Melton McKown
Florida Department of Revenue
Tax Policy and Dispute Resolution
Post Office Box 7443
Tallahassee, Florida 32314-7443

Dear Mr. McKown:

Enclosed is a copy of the Application for Final Examination and Certification of resource recovery equipment at Pasco County Resource Recovery Facility. We are reviewing the application for compliance with Section 62-704.400 and .410, Florida Administrative Code. Our Final Examination Report will be forwarded to you when complete.

Sincerely,

Jan Rae Clark

Jan Rae Clark
Environmental Manager
Solid Waste Section

JRC/jrc

Enclosure

cc: Bob Butera ✓
File

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form # 62-701.900(6)
Form Title Ap. for Prelim. Exam.& Final Exam of Resource Recovery Equipment
Effective Date 12/23/96
DEP Application No. (Filled in By DEP)

Application for
☐ Preliminary Examination
☒ Final Examination and Certification of Resource Recovery Equipment

An application for preliminary examination of proposed Resource Recovery equipment is required for issuance of a preliminary examination report, pursuant to Rule 62-704.400, Florida Administrative Code (F.A.C.). An application for final examination and certification is required for final examination and certification of Resource Recovery equipment, pursuant to Rule 62-704.410, F.A.C. An applicant may not apply for final examination and certification of Resource Recovery equipment before that equipment is installed.

1. Identity of Applicant

   Applicant's Name: Resources Conservation Company, a Division of Ionics, Inc.

   Mailing Address: 3006 Northup Way, Bellevue, WA 98004

   Phone Number: (206) 828-2400

2. a. Name of facility or project: Leachate Treatment Facility

   b. Construction permit number for the facility: SC51-277316

   c. Street address of the facility(main entrance): Pasco County Resource Recovery Plant, Hudson, FL

   d. Estimate date when facility will be ready for operation: March 21, 1997

3. Name of the unit of local government that will eventually own or benefit from the resource recovery equipment:

   Pasco County, Florida

   Attach proof of contractual agreement between the purchaser of the equipment and the unit of local government which is to benefit from or own the resource recovery equipment.

4. Describe the resource recovery process (include technology used and materials or energy recovered). Attach descriptions (including blueprints, drawings, engineering plans, etc.) that will indicate where and how the equipment is integrated into the resource recovery process. Attach additional sheets, if necessary.

   The Leachate Treatment Facility consisting of a steam vapor recompression evaporator (Brine Concentrator) system and a spray dryer system (continued on attachment)

5. Attach a numbered listing of equipment which the applicant declares is qualified resource recovery equipment subject to the exemption provisions of Rules 62-704.400, 62-704.410, 62-704.420, and Rule 12A-1.001(27), F.A.C., using the format on page 3.

   a. Use the "Item No." column to sequentially number equipment on the list.
   b. Use the "Item Description" column to provide the name and a brief description of the equipment.
   c. Use the "Number of Pieces" column to indicate how many of this particular piece of equipment are being certified.
   d. Use the "Process Description" column to indicated the page number of the process description text where the equipment and its function is described.

   If drawings are submitted as supporting documentation:

   e. Use the "Drawing Number" column to indicate the drawing number on which the equipment is shown.
   f. Use the "Drawing Item No." column to indicate what number on the drawing represents this piece of equipment.
   g. Use the "Equipment Cost" column to indicate the cost of the equipment.

DEP Form # 62-701.900(6)
Ap. for Prelim. Exam.& Final Exam
Form Title of Resource Recovery Equipment
Effective Date 12/23/96
DEP Application No. _____ (Filled in By DEP)

6. Certification A shall be completed if the applicant wishes to certify only equipment appearing on the list in Rule 62-704.600, F.A.C.

Certification B shall be completed if the applicant wishes to certify equipment not appearing on the list in Rule 62-704.600, F.A.C., or equipment appearing on the list in Rule 62-704.600, F.A.C. together with auxiliary equipment.

Certification A

I hereby certify that the equipment contained herein is Resource Recovery Equipment as defined in Rule 62-701.200(97), F.A.C. I further certify that all of the equipment meets the criteria set forth in Rule 62-704.420, F.A.C., and all of the equipment appears on the list in Rule 62-704.600, F.A.C.

Signature of Purchaser

Name and Title

Date

Certification B

I hereby certify that the equipment contained herein is Resource Recovery Equipment as defined in Rule 62-701.200(97), F.A.C. I further certify that the equipment, including all auxiliary equipment associated with that equipment, meets the criteria set forth in Rule 62-704.420, F.A.C.

Affix Seal Here

Signature of Professional Engineer

Vince Mannella, Solid Waste & RRP Manager
Name and Title

Florida Registration No. 31461 FL.

Date March 27, 1997

7. The undersigned is aware that statements made in this form and attached exhibits constitute an application for certification of Resource Recovery equipment from the Florida Department of Environmental Protection. The applicant certifies that the information in this application is true, correct, and complete to the best of his knowledge and belief.

Signature of Applicant

Michael Spann, Project Manager
Name and Title

Date March 20, 1997

The applicant shall submit four (4) copies of the application to:

Environmental Administrator
Solid Waste Section
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, MS 4565
Tallahassee, Florida 32399-2400
(904) 488-0300

DEP Form# 62-701.900(6)
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Listing of Major Equipment for Pasco County Leachate Treatment Facility
(Facility Name)

Item No.	Item Description	Number of Pieces	Process Description Page Reference	Drawing No.	Drawing Item No.	Equipment Cost
1	Sodium Sulfate Pump	1	A-6,A-7	M4-1,Sht 2	P-015,	4,712.00
2	Sodium Sulfate Tank Mixer	1	A-6,A-7	M4-1,Sht 2	MX-016	1,364.00
3	Sodium Sulfate Tank	1	A-6,A-7	M4-1,Sht 2	T-014	8,010.00
4	Scale Inhibitor System	1	A-6,A-7	M4-1,Sht 2	P-026	984.50
5	Acid System	1	A-6	M4-1,Sht 2	P-011	2,411.50
6	Feed Tank	1	A-6,A-7	M4-1,Sht 2	T-001	6,160.00
7	Feed Tank Mixer	1	A-6	M4-1,Sht 2	MX-002	1,289.00
8	Feed Pump	1	A-7	M4-1,Sht 2	P-003	2,819.00
9	Heat Exchanger	1	A-8	M4-1,Sht 3	HX-100	7,484.00
10	Distillate Pump	1	A-13	M4-1,Sht 3	P-111	2,475.00
11	Distillate Tank	1	A-12,A-13	M4-1,Sht 3	T-110	6,400.00
12	Rubber Expansion Joint	1	N/A	M4-1,Sht 4	XJ-03	1,334.00
13	Deaerator	1	A-8	M4-1,Sht 3	T-101	*
14	Evaporator	1	A-9,A-10	M4-1,Sht 4	E-120	*
15	Recirculation Pump	1	A-10,A-11	M4-1,Sht 4	P-121	12,257.00
16	Evaporator Recirc Ducts	1	A-10	M4-1,Sht 4	w/ P-121	43,230.00
17	Evap Vapor Ducts/Seal Leg	1	A-11	M4-1,Sht 5	E-130	21,600.00
18	Seed Tank	1	A-11	M4-1,Sht 4	T-151	8,062.00
19	Seed Tank Mixer	1	A-11	M4-1,Sht 4	MX-152	1,353.00
20	Seed Pump	1	A-11	M4-1,Sht 5	P-150	2,953.00
21	Vapor Compressor	1	A-11,A-12	M4-1,Sht 6	K-131	83,474.08
22	Spray Dryer Feed Tank	1	A-14	M4-1,Sht 6	T-300	24,815.00
23	Spray Dryer Feed Pump	1	A-14	M4-1,Sht 6	P-301	3,220.00
24	Spray Dryer Feed Tank Mixer	1	A-14	M4-1,Sht 6	MX-302	8,884.00
25	Spray Dryer Unit	1	A-14	M5-1,Sht 2	Niro PFD	497,222.00
26	Startup Boiler	1	--	M4-1,Sht 7	B-101	7,755.00
27	Vertical Sump Pump	2	--	--	--	9,920.00
28	Drain Sump Mixer	1	--	--	--	3,730.00
29	PLC Cabinet	1	N/A	M5-1,Sht 1	N/A	4,912.00
30	PLC	1	N/A	M5-1,Sht 1	N/A	42,660.60
31	Skids & Platforms	Lot	N/A	M4 shaded	N/A	164,520.00
32	MCC, 480V & 120V	2	N/A	M5-1,Sht 1	N/A	18,357.40
33	Transmitters & Flowmeters	Lot	N/A	All M4 shts	Various	29,722.86
34	Pressure Regulators	Lot	N/A	M4 shts	Various	2,701.02
35	Level Switches & Indicator	Lot	N/A	M4 shts	Various	5,717.00
36	Pressure & Temp Indicators	Lot	N/A	M4 shts	Various	3,803.00
37	Control Valves	Lot	N/A	M4 shts	Various	27,253.00
38	Lab Equipment	Lot	N/A	N/A	N/A	3,860.51

* Cost included in the Contract Firm Fixed Price Supply

ATTACHMENT TO DEP FORM #62-701.900(6) - ITEM 4 CONTINUED

will operate to process up to 35,000 gallons per day of leachate being produced at Pasco County's Solid Waste Facility. Eighty-six (86) percent or more of the leachate will be recovered in the form of distillate which as high quality water will be recycled to the Solid Waste Facility and used for boiler feedwater and cooling tower makeup. The remaining wastewater will be purged as concentrated brine and further processed to dry solids by a spray dryer.

As boiler feedwater and cooling tower makeup, the distillate produced by the Leachate Treatment Facility will displace up to 30,000 gallons per day of well water currently supplied to these users. Treatment of the Leachate prevents its discharge to the adjacent sewage treatment plant where it's constituent dissolved salts will jeopardize Pasco County's reuse water system. The treatment of leachate and recovery of distillate conserves well water resource and preserves reuse water production. The Leachate Treatment Facility is therefore an integral part of the Solid Waste Facility and its operation.

The Leachate Treatment Facility is described in detail by the following attached documents:

- Appendix A, Doc. No. 615-51000: Pasco County Leachate Treatment Facility - Brine Concentrator and Spray Dryer System Process and System Description.

Drawing No.	Sheet	Title
615-M3-1	1 & 2	Process Flow Diagram
615-M4-1	1	P&ID - Legend
	2	P&ID - Pretreatment System
	3	P&ID - Feed & Distillate System
	4	P&ID - Evaporator
	5	P&ID - Vapor Compressor
	6	P&ID - Spray Dryer
	7	P&ID - Utilities
615-M5-1	1	Equipment Installation - Plan View
	2	Equipment Installation - Elevations
	3	Equipment Installation - Sections & Detail
	4	Equipment Installation - Schedules

- Contract Agreement between Resources Conservation Company and Pasco County for Provision and Installation of Leachate Treatment Equipment (approving signature section only).

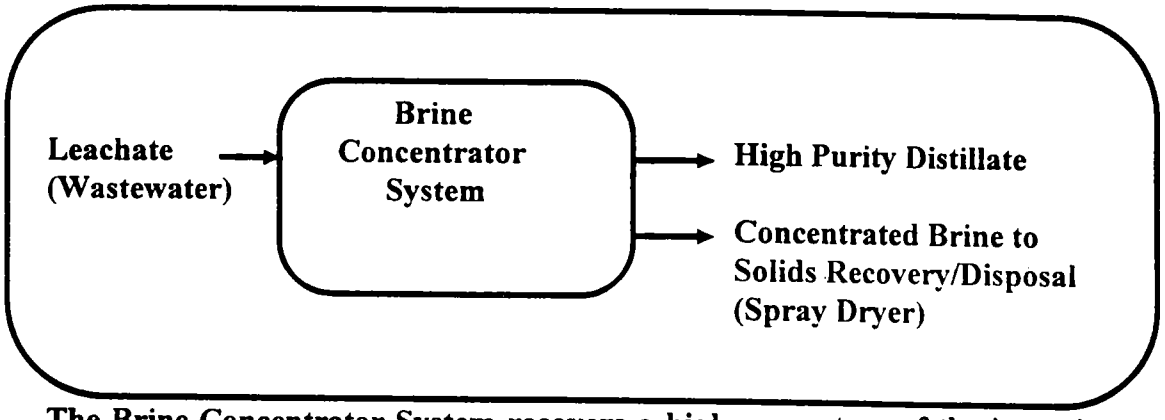
PASCO COUNTY LEACHATE TREATMENT FACILITY

BRINE CONCENTRATOR & SPRAY DRYER PROCESS & SYSTEM DESCRIPTION

APPENDIX A
OF
RCC DOC. NO. 615-51000

1.0 SYSTEM OVERVIEW

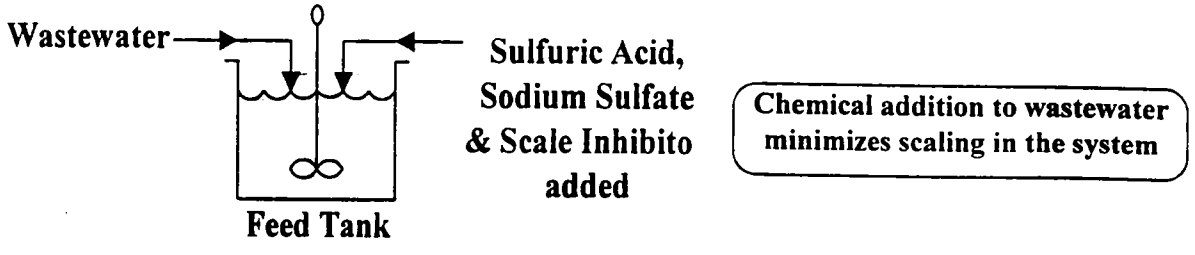
The Leachate Management System was designed specifically for Pasco County's Solid Waste Facility by Resources Conservation Company (RCC). It consists of a Brine Concentrator and a Spray Dryer. The Brine Concentrator accepts leachate as feed, concentrates it to a high solids level brine and produces a very pure distillate available for plant re-use. The concentrated brine purge stream from the Brine Concentrator is directed to the Spray Dryer which evaporates the remaining moisture in the brine and produces a dry free-flowing solid material for disposal.



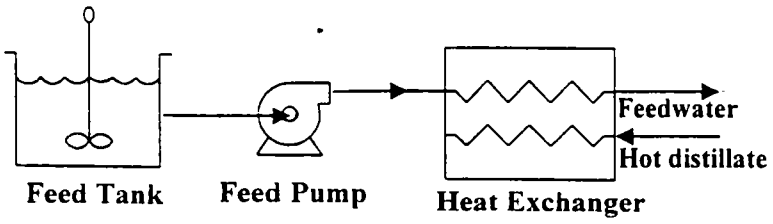
The Brine Concentrator System recovers a high percentage of the incoming wastewater stream as high purity distillate.

2.0 GENERAL DESCRIPTION (SEE DWG 615-M3-1)

The wastewater (leachate) gathers in a Feed Tank where Sulfuric Acid, Sodium Sulfate and Scale Inhibitor are added to minimize scaling in the system.

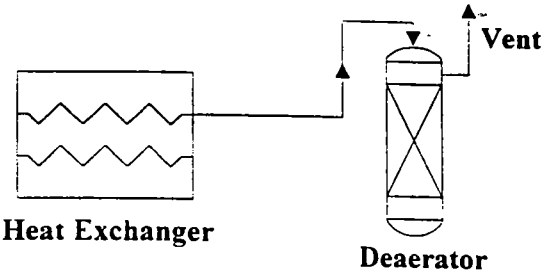


The treated wastewater (feed water) is pumped through a plate and frame Heat Exchanger to heat the feed water to near its boiling point.

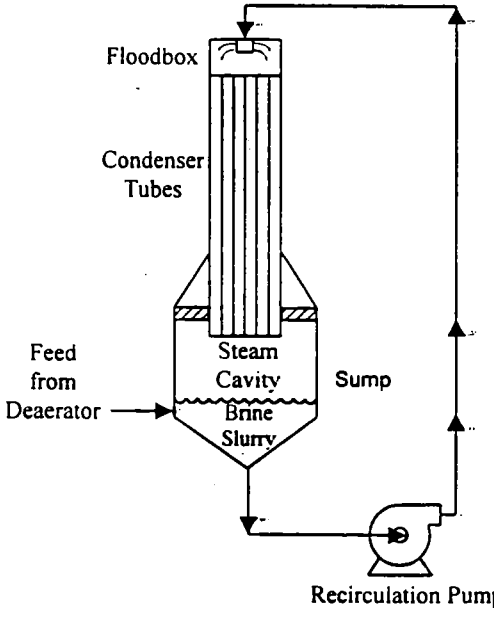


Feed water is heated to aid in the release of undesirable gases

The feed water then enters a Deaerator where noncondensible gases are stripped out and vented to atmosphere. This prevents these gases from interfering with the evaporation process and minimizes corrosion/scaling of the Evaporator internals.

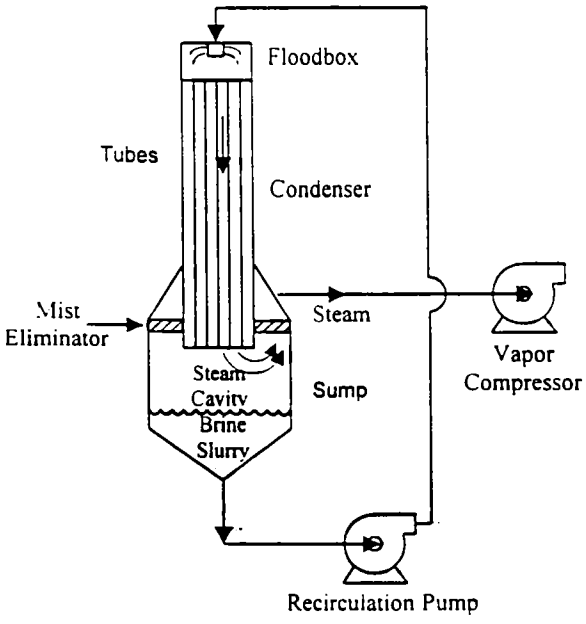


Gases vented to atmosphere



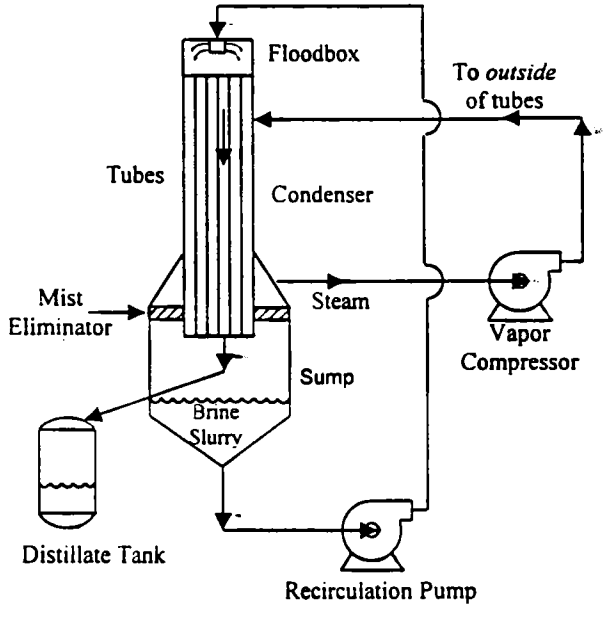
The feed flows by gravity from the bottom of the Deaerator into the Evaporator Sump. Here it mixes with recirculating concentrated brine slurry.

The brine slurry is pumped up to a Floodbox at the top of the Evaporator and is distributed evenly as a thin film on the inside of each of the Evaporator's vertical tubes. As the brine flows down the tubes to the Evaporator Sump, it is heated to its boiling point. A portion of the water in the brine is driven off as water vapor (steam) which flows down the center of the tubes into the steam cavity (the space above the brine slurry in the Evaporator Sump).

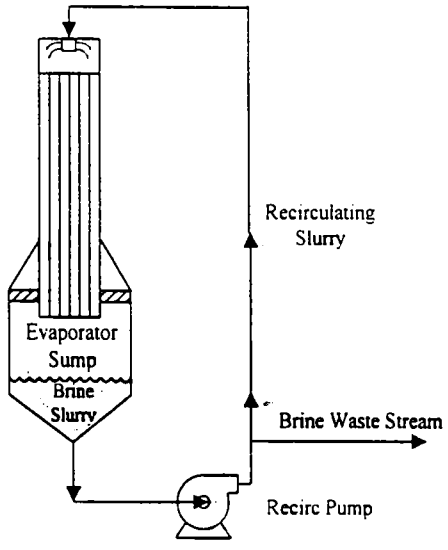


The steam is drawn from the steam cavity through Mist Eliminator pads to the Vapor Compressor. The Mist Eliminator pads trap and remove liquid droplets and entrained solids from the water vapor.

The water vapor is then compressed in a Vapor Compressor to raise its temperature above the boiling point of the thin film of brine flowing down the inside surface of the tubes.



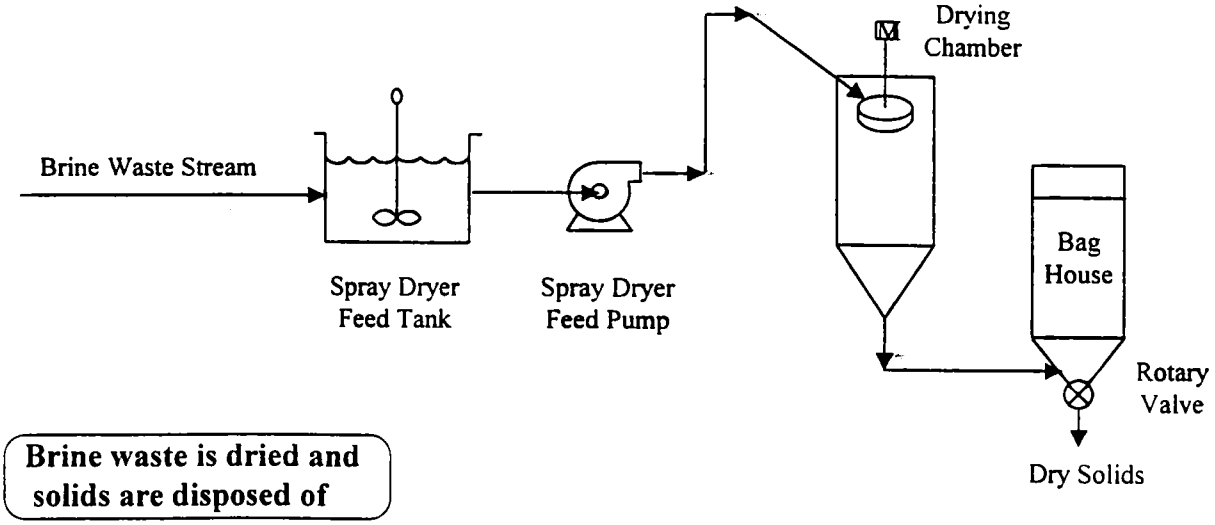
The higher pressure vapor exits the Vapor Compressor and condenses on the **outside** of the Evaporator tubes, transferring its heat to the thin film of brine flowing down the inside of the tubes. The condensate runs down the outside surface of the tubes to the bottom of the Condenser and then flows to the Distillate Tank. It is then pumped to the plant for re-use.



As water vapor is drawn out of the thin film of recirculating brine flowing down the tubes, the slurry becomes more concentrated and precipitating crystals appear in the thin brine film. To prevent the newly formed crystals from scaling the tube walls, these crystals are offered artificial surfaces that they can adhere to instead. Calcium sulfate crystals, added to the sump prior to initial start-up, act as a "seed" material for the precipitating crystals to adhere to. The calcium sulfate crystals (suspended solids) continue to precipitate at a rate determined by the calcium and sulfate levels in the incoming feed water.

A small portion of the recirculating brine in the Evaporator is drawn off as a waste stream to prevent over-concentration. This purge stream is sent to the Spray Dryer Feed Tank and then to the Spray Dryer for further processing.

The concentrated brine in the Spray Dryer Feed Tank is agitated by a mixer to keep solids suspended. The brine is then pumped to a Drying Chamber and atomized. The droplets are heated and dehydrated as they fall to the bottom of the chamber. The resulting dried solids are transferred to a bag house by means of air flow induced by an exhaust fan. The solids then exit the bag house through a rotary valve and are discharged directly for disposal.



Brine waste is dried and solids are disposed of

NOTE: In the following descriptions, reference is made to "Hot Standby." The Hot Standby interlock is designed to protect the equipment and the process in the event of any shutdowns, whether caused by failure of equipment or process. It will place the Evaporator in a fail-safe mode, the processing will cease and some selected pumps will continue running. A detailed explanation of Hot Standby is presented in Section 6.0.

3.0 DETAILED DESCRIPTION

3.1 Pretreatment and Feed System (See P & ID 615-M4-1, sht. 2)

Plant wastewater gathers in the Feed Tank where Sulfuric Acid, Sodium Sulfate and Scale Inhibitor are added. The contents are blended by the Feed Tank Mixer. The acid is added to maintain a pH of 5.5 in the feed water. This reduces the potential for carbonate scaling in the system by causing a chemical reaction that releases the carbonates (in the form of CO_2 and oxygen) in the Deaerator. Scale Inhibitor is added to prevent salt precipitation and fouling or scaling in the Heat Exchanger and Deaerator. Sodium Sulfate addition is required to maintain the proper suspended solids level in the sump. Failure to maintain the proper suspended solids level in the Sump will result in tube scaling.

A. Acid, Sodium Sulfate, and Scale Inhibitor Addition

Acid Addition - pH Control

The design pH for the Feed Tank wastewater is 5.5. This wastewater pH is optimum for the release of unwanted gases from the wastewater in the Deaerator. To maintain this pH, transmitter AT-0020 signals pH Controller AIC-0020 to automatically increase or decrease the Acid Pump capacity output as required to keep the pH value feedback signal equal to the setpoint (desired value). The controller will reset to manual and zero output when the Hot Standby interlock is activated.

The Feed Tank is instrumented to alarm on high and low pH values. Very high and very low values will start a 5 minute timer to activate the Hot Standby interlock.

Sodium Sulfate Addition-Tube Scaling Control

Sodium Sulfate addition will be necessary to maintain the proper suspended solids level in the Sump. Sodium Sulfate is manually added to the Feed Tank by adjusting the Sodium Sulfate Pump capacity control (see instructions in Appendix C, C.4.1). A shutdown of the Sodium Sulfate Pump will activate the Hot Standby interlock when enabled.

The Sodium Sulfate Tank Mixer will shut down on a low tank level.

Scale Inhibitor Addition - Heat Exchanger and Deaerator Anti-Scale Control

As the feed water becomes hot, calcium sulfate crystals would normally start to precipitate in the Heat Exchanger and the Deaerator. The addition of scale inhibitor to the feed water prevents this precipitation. The scale inhibitor is manually added to the Feed Tank by adjusting the Scale Inhibitor Pump capacity control. A shutdown of the Scale Inhibitor Pump will activate the Hot Standby interlock.

This pump is controlled from the DCS and started in the MANUAL mode. When in AUTO, it is included in the Hot Standby interlock.

B. Feed Tank T-001 and Feed Pump P-003

The Feed Tank level is maintained (at setpoint) by transmitter LT-0010 and controller LIC-0010. Controller LIC-0010 adjusts the output of Feed Tank Level Control Valve LV-0010 to maintain constant level.

When the Hot Standby interlock is engaged, a very high (LSHH) or very low (LSLL) Feed Tank level will cause a process trip and the unit will go into the Hot Standby mode. An extremely low (LSLLL) level will produce an equipment safety trip to shut down the Feed Tank Mixer and an even lower level (LSLLLL) will trip the Feed Pump.

A shutdown of the Feed Pump for any reason will activate the Hot Standby interlock.

C. Feed Flow Control

Feed flow control has three settings: MANUAL, AUTO, or RATIO. MANUAL or AUTO is used during start-up. RATIO mode is used during normal operation.

MANUAL: The controller output is manually set to control the amount of feed water added to the Evaporator through the Feed Flow Control Valve FV-1007.

AUTO: The feed water for the Evaporator is metered by the Feed Flow Control Valve FV-1007 located upstream of the Heat Exchanger. Flow Transmitter FT-1007 senses the feed flow and signals the flow controller (FFIC-1007) to open or close the flow control valve as required to maintain an operator determined setpoint. When in AUTO, the flow controller is included in the Hot Standby interlock and will reset to MANUAL and zero output when the interlock is activated.

RATIO: The RATIO mode helps maintain a constant Sump level and balance of the feed and distillate flows through the Heat Exchanger. This results in stable system operation and limits the heat inbalance. When the flow controller is in ratio mode, it receives its ratio setpoint by multiplying the distillate flow (FT-1013) by a ratio multiplier. The ratio multiplier is calculated by converting the Sump Level Controller output (0-100%) to a ratio multiplier of 0.8 - 1.2. This limits the feed water flow to 20% overfeed or underfeed of the distillate flow. When in RATIO the flow controller is included in the Hot Standby interlock, and will reset to MANUAL and zero output when the interlock is activated.

3.2 Heat Exchanger HX-100 (See P &ID 615-M4-1, sht. 3)

Feed water enters the Heat Exchanger at approximately 60° F and is heated to about 207° F by counterflowing hot (about 234° F) distillate which is being pumped from the Distillate Tank.

The Heat Exchanger consists of a frame in which thin titanium plates supported by rails are clamped between header and follower plates. The thin titanium plates are sealed at their outer edges and around the ports by gaskets and are arranged so that the feed and hot distillate are directed alternately into the passages between the plates (See Figure A-1).

3.3 Deaerator T-101: Noncondensible Gas Removal

The Brine Concentrator feed water contains some noncondensible gases and carbonates (converted to CO_2 and oxygen by acid addition) which must be removed before the feed water enters the Evaporator Sump. If the noncondensible gases such as oxygen are not removed, the dissolved oxygen may cause corrosion in the system. Also, gases released to the vapor atmosphere of the Sump would eventually interfere with the heat transfer in the Condenser. If carbonates are not removed, scaling on the Brine Concentrator tubes could occur. The Deaerator operates to remove these gases.

The Deaerator is a vertically mounted cylindrical vessel which contains a column of heat resistant plastic packing material. The preheated feed water enters the Deaerator through a distribution nozzle and is sprayed over the top of the packing. The feed water flows by gravity down through the packing where it is intimately contacted with steam. Stripping steam from the steam cavity at the top of the Distillate Tank is introduced into the Deaerator below the packing. This steam flows upward, counter-current to the falling feed water and strips away oxygen, carbon dioxide, nitrogen and other noncondensible gases. The excess steam and the removed noncondensible gases are vented from the Deaerator to the atmosphere through the Deaerator vent line. A flow orifice in the Deaerator vent line provides a restriction so that pressure can be maintained in the Deaerator. The stripping steam flow into the Deaerator is controlled to maintain the required pressure in the Deaerator (See Figure A-2). During start-up, start-up steam can be introduced to the Deaerator to help preheat the feed and to strip the incoming feed of noncondensible gases.

A. Deaerator Pressure Control

The steam flow to the Deaerator is metered through the Deaerator Pressure Control Valve (PV-1005). The Pressure Controller (PIC-1005) automatically opens or closes the pressure control valve as required to keep the Deaerator pressure feedback signal (PT-1005) equal to the setpoint (desired value).

The Deaerator is instrumented to alarm on high (PAH) and low (PAL) pressures. Low Deaerator pressure in not included in the Evaporator's Hot Standby interlock, however, the Evaporator should not be operated with low Deaerator pressure as insufficient deaeration of the feed water will occur.

NOTE: The Evaporator must be operated with sufficient Deaerator pressure to prevent scaling and corrosion.

3.4 Evaporator System (See P &ID 615-M4-1, sht. 4)

The Evaporator vessel consists of the Floodbox, the Condenser and the Sump. The vessel is vertical with the Sump at the bottom, the Condenser in the middle and the Floodbox at the top. The overall height of the Evaporator vessel is 50'-3" from the base to the top flange and the Sump diameter is 11'-2".

The Condenser is a vertically mounted, single pass, shell and tube heat exchanger. It has 267 titanium tubes. Each tube has a 0.028 inch wall thickness, 2.0 inch outside diameter and is 300 inches long. The tube bundle is contained inside a stainless steel shell and is terminated at each end by a tubesheet. The upper tubesheet is made of titanium clad 316L stainless steel and forms the floor of the Floodbox. The lower tubesheet is made of alloy 625 and is located in the steam cavity (the top section) of the Sump. Three of the tubes are extended to the upper section of the floodbox and act as equalization tubes between the sump and floodbox. One of the tubes is used a Brine return path for particles too large to pass though the Brine Strainer Screen.

The Floodbox forms a space above the upper tubesheet where the brine slurry enters the tubes of the Condenser. Specially designed distributors in the top of each tube regulate the flow to each tube and introduce the brine slurry as a thin film to the inside surface of each tube. The flow per tube and the recirculation pumping rate have been designed to maintain a flooded level above the top tubesheet of approximately 11 inches.

The Sump is the collection area for the falling film from the tubes and a storage area for the brine slurry to enter the Recirculation Pump. The Sump has a working volume of 7600 gallons and a recirculation rate of 1320 gpm. The entire volume of the Sump is turned over approximately once every 5-6 minutes. The brine slurry contains approximately 1.15 percent suspended solids. The high recirculation rate of the brine provides continuous agitation of the slurry in the Sump and prevents the suspended solids from settling from the brine. The Sump floor is sloped at a 45 degree angle to prevent solids from settling on it.

The section of the Sump above the Sump liquid level is called the steam cavity. The top of the Sump wall is angled inward to form an inverted conic section which supports the Condenser. The lower tubesheet of the Condenser is suspended approximately 48 inches above the Sump liquid level. Mist Eliminator pads are installed between the inside of the Sump wall and the outside of the Condenser shell to remove liquid droplets or entrained suspended solids from the steam as it flows upward to the vapor outlet nozzle and on to the Vapor Compressor.

A. Sump Level Control

The Sump level transmitter (LT-1210) range brackets the operating level of the Sump (0 - 100%). The transmitter taps into the Sump are kept clear of solids by a continuous flow of purge water (distillate). The purge water flow rate is set to 1.0 gph for each tap to continually clean the transmitter pressure sensing lines.

The RATIO feed control mode helps maintain a constant Sump level (Refer to Section 3.1 C).

The Sump level is instrumented to alarm on high (LAH) and low (LAL) levels. Very high (LSHH) and very low (LSLL) levels will activate the Hot Standby interlock. An extremely low (LSLLL) level will produce an equipment safety trip on the Recirculation Pump.

B. Sump Pressure Control

The Sump pressure is controlled by venting steam from the Distillate Tank steam cavity. This vents Condenser steam, reducing the energy which is available to evaporate the recirculating brine, which in turn reduces the Sump pressure. In a steady state operation, the Evaporator is designed to maintain continuous venting. This ensures noncondensible gases are purged from the system.

The Sump pressure is controlled by the Distillate Tank vent valve (PV-1220). The Sump pressure controller automatically opens or closes the Distillate Tank vent valve to keep the Sump pressure feedback signal (PT-1220) equal to the setpoint (desired value).

The Sump pressure is instrumented to alarm on high (PAH) and low (PAL) pressures. Very high (PSHH) and very low (PSLL) pressures will activate the Hot Standby interlock (see Appendix B).

C. Mist Eliminators

Steam from the steam cavity above the Sump brine level passes through Mist Eliminator pads before it is drawn into the Vapor Compressor suction. Entrained liquid droplets in the steam (containing dissolved or suspended solids) are left deposited on the lower surface of the Mist Eliminators pads.

These deposits are periodically washed off the of Mist Eliminator pads by the Mist Eliminator Wash System. The Mist Eliminator Wash System uses hot distillate to spray the lower surface of the Mist Eliminator pads. The Mist Eliminator pads should be washed for 10 seconds, once every 5 minutes. This is done automatically.

3.5 Brine Recirculation

The Recirculation Pump takes suction through ducting at the bottom of the Sump, and pumps the brine through the discharge ducting at a rate of 1320 gpm to the Floodbox. The discharge ducting enters the top of the Floodbox, where a nozzle sprays the brine through the brine strainer and floods the upper tubesheet. The brine slurry then flows through the Distributors and is distributed as a thin film on the inside surface of each tube. This thin film of brine then flows down the inside surface Condenser tubes and falls back into the Sump. One of the Condenser tubes is dedicated as a drain for oversize particles which are separated by the brine strainer. This prevents these oversize particles from plugging the orifices in the Distributors. The oversize particles that are returned to the Sump are eventually broken down in size by continued passes through the Recirculation Pump.

To equalize the pressure between the Sump and the Floodbox, three of the Condenser tubes are extended into the upper section of the Floodbox.

A. Recirculation Pump P-121

The Recirculation Pump is a centrifugal type with a single mechanical seal and has a pumping rate of 1320 gpm. It is controlled from the PLC and is started in the manual mode. The

Recirculation Pump is not included in the Hot Standby interlock and will remain running when the interlock is activated. Only an extremely low Sump level (LSLLL) will trip the Recirculation Pump when it is in AUTO. A shutdown of the Recirculation Pump will activate the Hot Standby interlock and trip the Vapor Compressor even if the Vapor Compressor is in manual.

3.6 Seed Tank T-151 & Seed Pump P-150

Prior to the initial start-up of the Evaporator, the contents of the unit are "seeded" by the addition of calcium sulfate (gypsum). The Seed Tank is used to mix a solution of water and calcium sulfate. During the seeding operation, the Seed Tank can be manually filled with feed water from the Evaporator by opening Seed Valve LV-1520 or it can be filled with plant service water by opening manual valve V-413. Bags of Terra Alba seed material (see Appendix C) are added to the feed water (or service water) and this mixture is recirculated to/from the Evaporator through the recirculation duct.

The Seed Tank level is monitored by LT-1510. In AUTO, LSLL-1510 opens LV-1520 and LSHH-1510 closes LV-1520. The Seed Tank is instrumented to alarm on high (LAH) or low (LAL) levels. Seed Tank Mixer MX-152 is turned on and off manually. The mixer trips if the level drops below LSLLL-1510 setpoint. If the tank level drops below the LSLLLL-1510 setpoint, the pump is stopped.

3.7 Vapor Compressor K-131 (See P &ID 615-M4-1, sht. 5)

The Vapor Compressor takes suction from the Sump steam cavity. The steam is drawn through the Mist Eliminators and into the Vapor Compressor through the vapor suction duct. Steam above the brine in the Sump is controlled at a slightly positive pressure (6.5 in. w.c.). The steam cavity is protected from high pressure by a water filled seal leg that will release at 24 inches of w.c. (See Figure A-3).

The Vapor Compressor is a rotary lobe, positive displacement compressor. It has a lubrication system with main and auxiliary oil pumps, oil cooler, oil filter and oil reservoir. The Vapor Compressor has alarm and trip instrumentation for high oil temperature and low oil pressure. The Compressor is also instrumented for high inlet and outlet temperature and high differential pressure and temperature. A continuous flow of distillate is injected into the suction of the Vapor Compressor to improve the Compressor efficiency and to cool the discharge vapor. Inlet and Outlet Silencers aid in buffering the pulsations normally occurring with this type of compressor. The Vapor Compressor discharges into the Condenser. The discharge pressure will normally be between 8 to 9 psig.

The Recirculation Pump is interlocked with the Vapor Compressor and must be running before the Vapor Compressor will start. The Vapor Compressor is controlled from the PLC and has both manual and automatic mode. Manual mode will override any process related interlocks and trips. Since the compressor runs at a fixed speed, turndown operation is achieved by returning some steam from the discharge of the Vapor Compressor to the suction side via Bypass Control Valve HV-1310. The Bypass Control Valve position is adjusted by the operator from the control console. The Bypass Control Valve is the throttle for the system and establishes the processing capacity. The Hot Standby interlock is included when the Vapor Compressor is placed in AUTO mode, however, 30 minutes after the Vapor Compressor is

started, the control system will automatically enable the Hot Standby interlock even if the Vapor Compressor is in MANUAL mode.

A. Silencer Drains

During operation, excess injection water and steam condensate will accumulate in the Outlet Silencer (and to a lesser extent, the Inlet Silencer). An automatic drain valve (LV-1316) on the Outlet Silencer is activated by a level switch (LSH-1316) to automatically drain liquid from the Outlet Silencer. If the level of the water in the Outlet Silencer should get too high, a high level alarm switch (LSHH-1317) will alarm the operator of the high water level condition. Both silencers have sight glasses and manual drain valves for draining the silencers as needed.

Note: The silencer levels should be manually checked before start-up and during each shift and precautions taken to avoid condensate buildup in the compressor casing and plenum drains, headplate vent drains or silencer drains.

B. Rust Inhibitor

To protect the Vapor Compressor's internal machined surfaces during periods when the Evaporator is out-of-service, the Vapor Compressor should be washed, dried and rust inhibitor should be added as outlined in Section 8.3, "Brine Concentrator Total Shutdown and Mechanical Cleaning."

3.8 Distillate System (See P &ID 615-M4-1, sht. 2)

The compressed steam from the Vapor Compressor condenses on the outside of the condenser tube walls. This distillate collects at the bottom of the Condenser and flows into the Distillate Tank.

The amount of distillate produced is dependent on the position (% open) of the Vapor Compressor Bypass Control Valve (HV-1310). The Distillate Tank level is controlled to maintain a steam cavity at the top of the tank. Stripping steam is supplied to the Deaerator from this steam cavity. Also, the Sump Pressure Control Valve (PV-1220) vents steam from this steam cavity to control the Sump pressure.

The hot distillate is pumped from the tank through the Heat Exchanger (giving up its heat as previously described) to the plant for re-use. A portion of the distillate is used for Compressor injection water, Mist Eliminator pad washing, pump seal water and instrument purge water.

A. Distillate Tank Level Control

The distillate being pumped out of the Distillate Tank through Level Control Valve (LV-1110). The Distillate Tank Level Controller (LIC-1110) automatically opens or closes the level control valve as required to keep the tank level feedback signal (LT-1110) equal to the setpoint (desired value). When in AUTO the level controller will be included in the Hot Standby interlock and will reset to manual and zero output when the interlock is activated.

The Distillate Tank is instrumented to alarm on high (LAH) and low (LAL) tank levels. Very high (LSHH) and very low (LSLL) tank levels will activate the Hot Standby interlock (see Appendix B). An extremely low tank level (LSLLL) will trip the Distillate Pump.

B. Distillate Pump P-111

The Distillate Pump is a centrifugal type with a single mechanical seal and has a design flow rate of 24 GPM. The Distillate Pump is controlled from the PLC and started in the manual mode. When in AUTO it will be included in the Hot Standby interlock, and will stop and switch to MANUAL when the interlock is activated. A shutdown of the Distillate Pump will activate the Hot Standby interlock.

3.9 Sump Concentration

Water from the thin film of brine inside the condenser tubes is driven off as steam. This steam flows down the center of the tubes to the Sump steam cavity. As this water is evaporated from the recirculating brine, the brine becomes more concentrated and salt compounds start to form (see Figure A-4). The first salt compound to form or precipitate is calcium sulfate. The Evaporator is designed to precipitate calcium sulfate. Silica is captured in the calcium sulfate crystals and is controlled in this way. If the concentration of the recirculating brine is increased beyond design limits, secondary salts will begin to precipitate. Because of their physical characteristics these secondary salts are undesirable and must be kept in solution. Therefore, the Sump concentration becomes very important (see Section 4.0, "Brine Concentrator Waste System").

The density of the Sump solution is dependent on the Total Solids in solution. The Total Solids (TS) are a combination of precipitated solids, known as Total Suspended Solids (TSS), and the salts that are kept in solution, known as Total Dissolved Solids (TDS).

$$TS = TSS + TDS$$

The concentration of dissolved solids in the sump solution is critical. The dissolved solids level must be maintained below the point where undesirable salts begin to precipitate. The concentration of suspended solids in the Sump solution is also critical. There must be enough suspended solids to act as a seed for the concentrated salts to adhere to or to form crystals around. Otherwise, the concentrated salts would adhere to the hot tube walls. Crystal growth on the tube walls is known as scale and will decrease the capacity of the system and may eventually plug the tubes. This can be caused by either too high TDS levels or too low TSS levels.

3.10 Brine Waste Control

To keep the Sump Total Solids at the desired level, it is necessary to "blowdown" the Sump just as you blowdown Cooling Towers to control their solids levels.

The Sump Total Solids are controlled by a waste stream originating from the Recirculation Pump discharge. This stream discharges to the Spray Dryer Feed Tank.

During the concentration portion of the start-up process, the Sump TDS and TSS levels are determined by frequent wet chemistry tests. When the Sump TDS has reached the design level, the Evaporator waste stream is initiated. Even after operation stabilizes TDS and TSS wet chemistry must be done every shift to determine what the actual TDS and TSS levels are in the Sump brine and to verify proper operation of the density controller.

When in AUTO the Sump Density Controller (DIC-1230) will reset to MANUAL and zero output when the Hot Standby interlock is initiated. Low or high densities will trigger an alarm.

The operating solids levels are given in Section 4.0, "Brine Concentrator Waste System", along with the operating instructions for the waste system A word of caution here -- **do not operate the unit with high TDS level or with low TSS level.** These conditions will cause the tubes to scale.

To prevent blockages of the waste line, open Density Control Valve DV-1230 to 100% for 1 minute every hour. This sequence occurs automatically when the density loop is in AUTO.

3.11 Spray Dryer Feed Tank T-300 & Pump P-301 (See P &ID 615-M4-1, sht. 6)

The 8000 gallon Spray Dryer Feed Tank is used during normal operation to temporarily store waste brine until it is fed (via the Spray Dryer Feed Pump) to the Spray Dryer.

Spray Dryer Feed Tank level is monitored by LT-1611. A very high (LSHH) level will activate the Hot Standby interlock while a very low level (LSLL) will shut down the Spray Dryer. An extremely low level (LSLLL) will produce an equipment safety trip on the Spray Dryer Feed Tank Mixer MX-302 and an even lower level (LSLLLL) will trip the Spray Dryer Feed Pump P-301.

Note: The Spray Dryer Feed Tank Mixer must be ON whenever there is brine slurry in the tank.

3.12 Spray Dryer Unit

The Spray Dryer consists of a drying chamber, a air heater, a baghouse, and an exhaust fan. Brine from the Spray Dryer Feed Tank is pumped to the atomizer in the drying chamber of the Spray Dryer. A natural gas-fired air heater supplies heated air to the drying chamber. Brine is atomized and the droplets are dehydrated as they fall to the bottom of the chamber. The resulting dried solids are transferred to a bag house by means of air flow induced by an exhaust fan. The solids exit the bag house through a rotary valve and discharge directly for disposal. The dryer is equipped with a penthouse for access to the atomizer

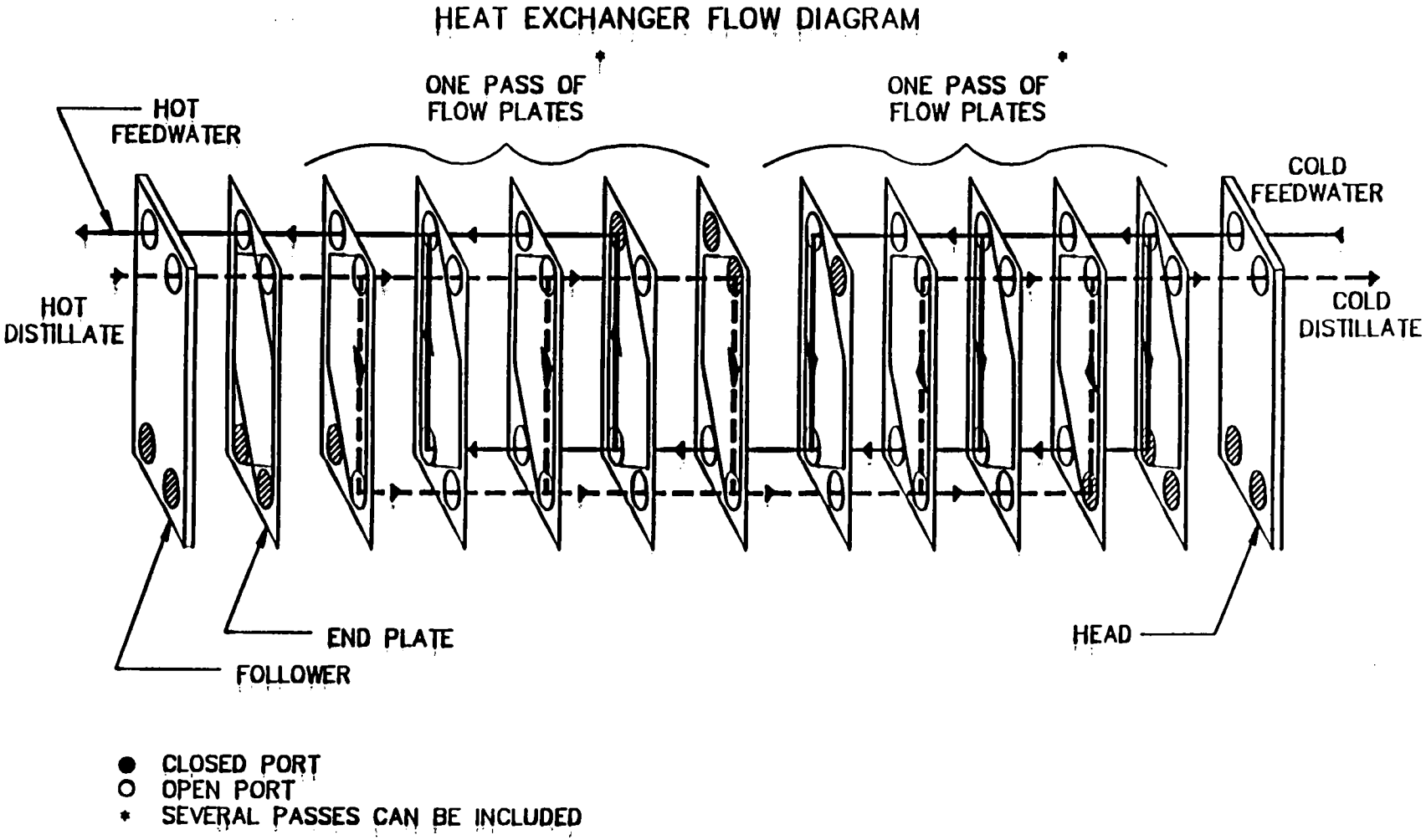
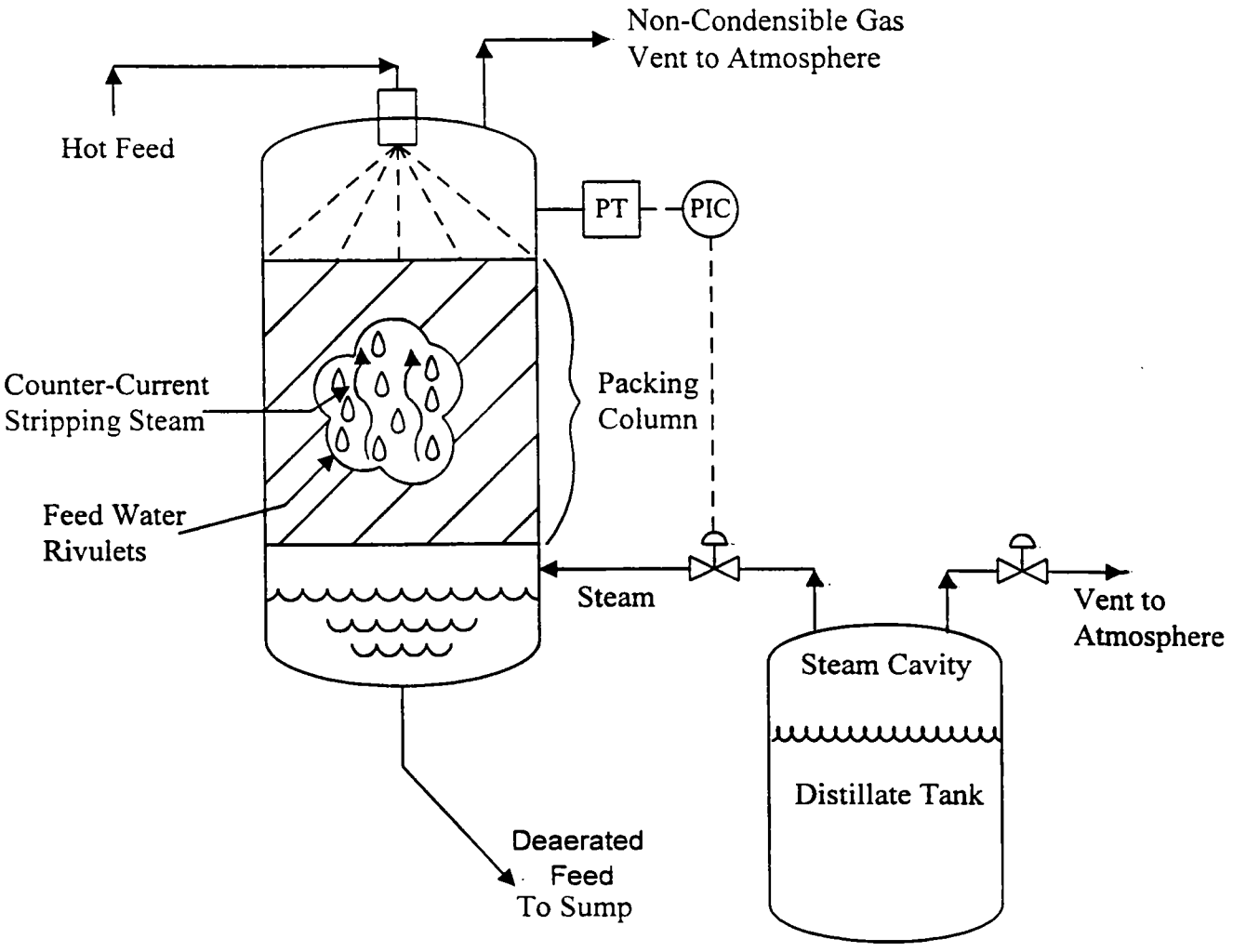


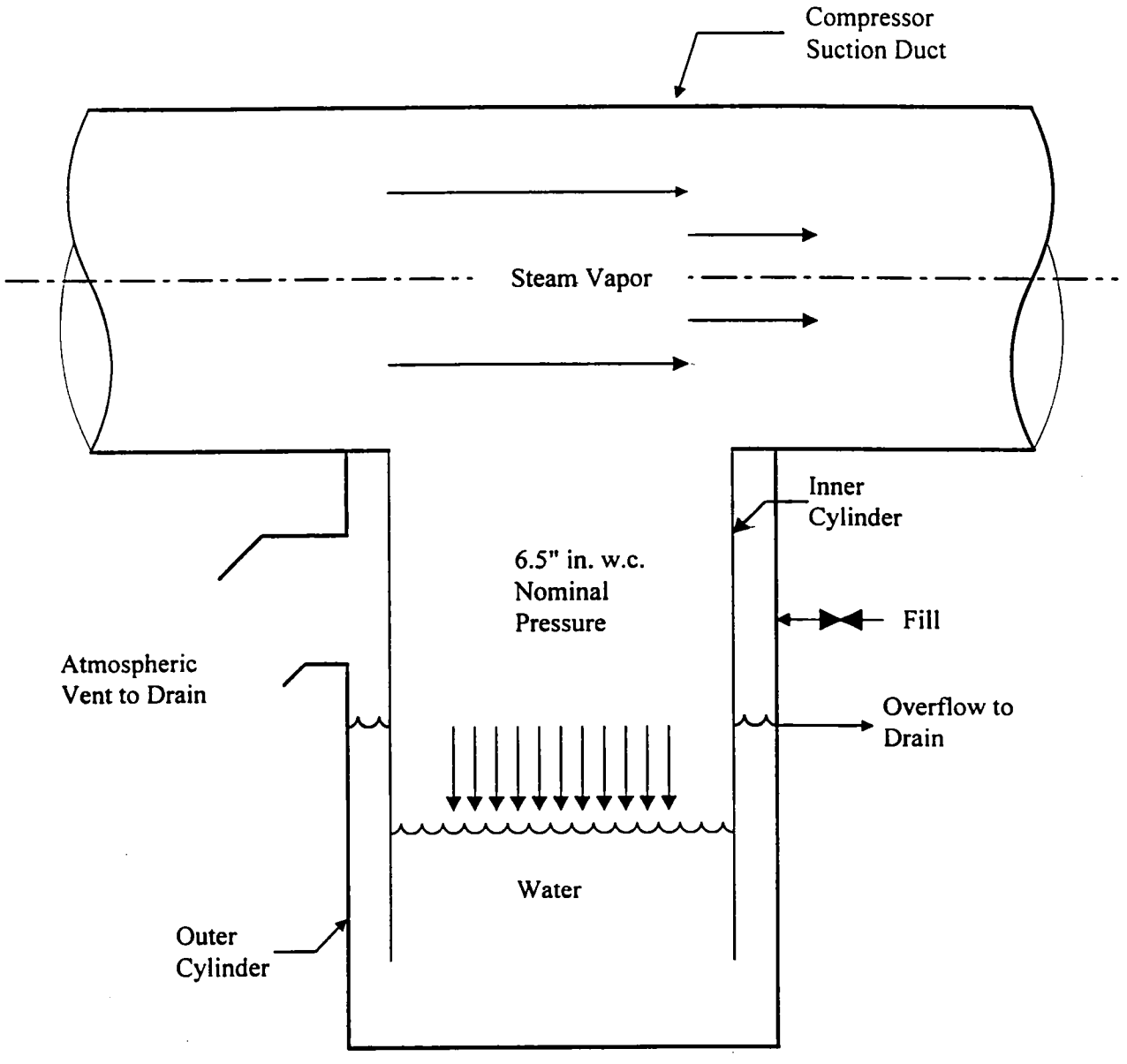
FIGURE A-1

FIGURE A-2



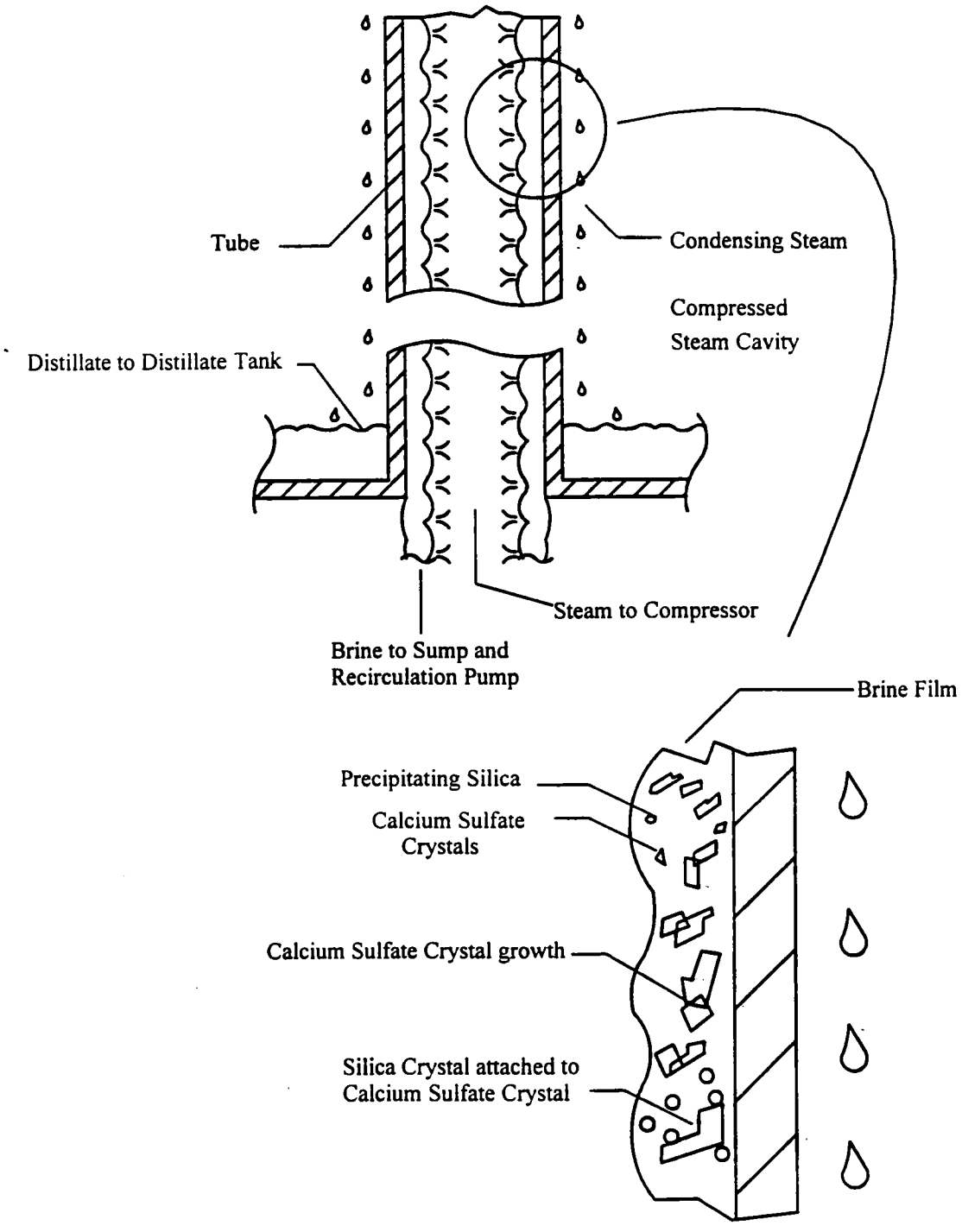
BRINE CONCENTRATOR DEAERATOR

FIGURE A-3

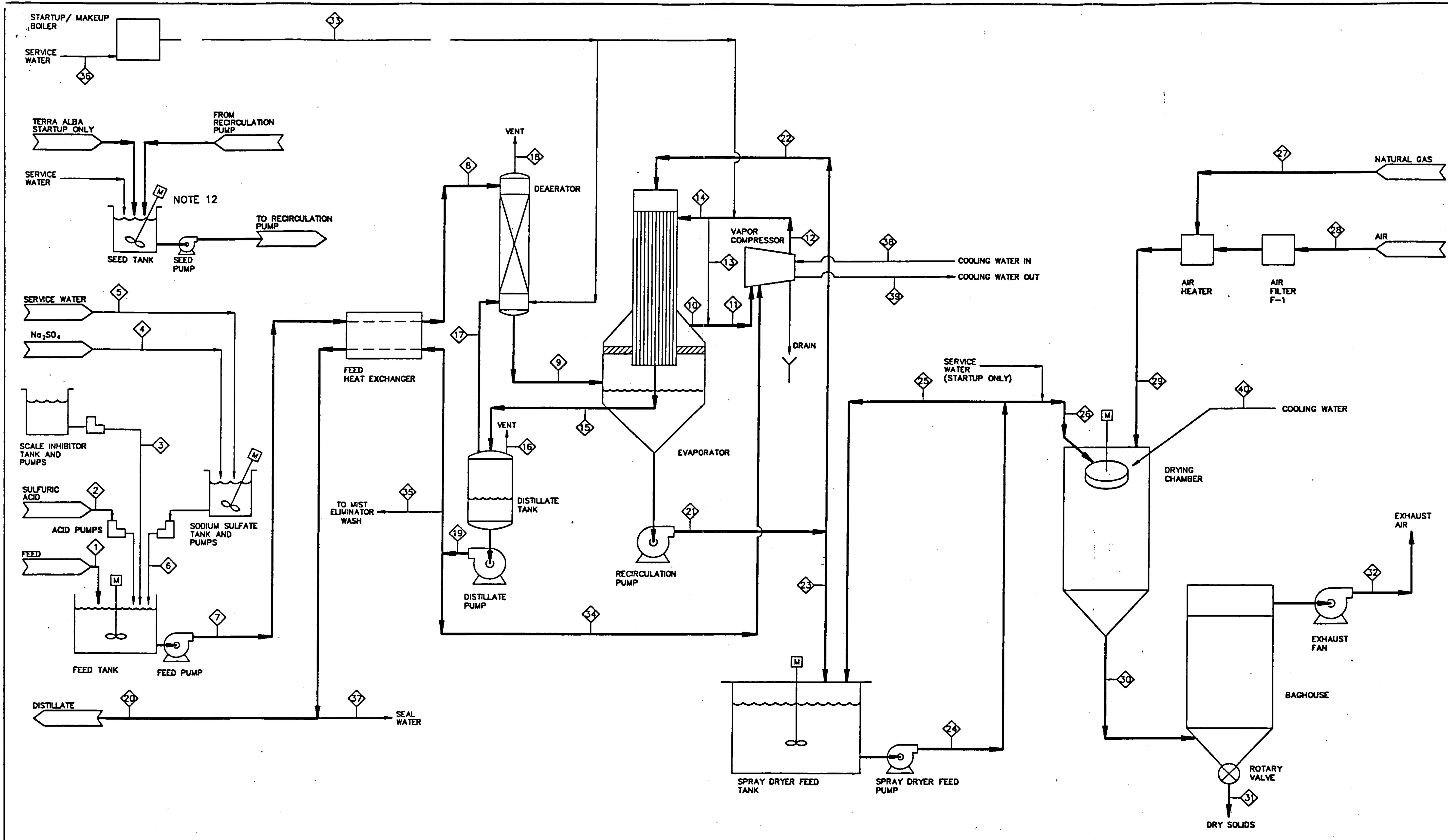


SEAL LEG

FIGURE A-4



Brine Concentrator Tube Cross Section



LTR	REVISIONS	BY	CHK	APP	DATE	LTR	REVISIONS	BY	CHK	APP	DATE

PROPRIETARY

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	M. Woolley 8/4/95

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PROCESS FLOW DIAGRAM

PASCO CO. LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

DRAWING NO 615-M3-1

SHEET NO. 1 OF 2

SCALE

STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		NOTE 1	NOTE 2			NOTE 3							NOTE 4		MIXED PHASE	NOTE 5	NOTE 6	NOTE 7		
MASS FLOW, LB/MIN	207.79	0.0262	0.00487	0.2088	1.8792	2.088	209.91	209.91	211.54	185.40	185.40	198.03	0.0	198.03	198.03	4.23	2.68	1.05	190.07	165.99
SPECIFIC GRAVITY, (40°F WATER)	1.0248	1.8331	1.200	CRYSTALS	0.9991	1.092	1.0258	0.9889	0.9820	0.000593	0.000590	0.000896	0.000896	0.000896	0.000878 / 0.9495	0.000878	0.000878	0.000619	0.9495	0.9979
VOL. FLOW, GPM (LIQUID)	24.30	0.00172	0.00486	- - -	0.225	0.229	24.536	25.438	25.817	---	---	---	---	---	23.99	---	---	---	23.99	19.935
VOL. FLOW, ACFM (VAPOR)	---	---	---	---	---	---	---	---	---	5011.88	5034.20	3540.0	0.0	3540.0	145.17	77.147	48.904	27.154	---	---
TOTAL DISSOLVED SOLIDS, MG/L	32686	93 WT%	10(%	---	---	10 WT%	33706	33706	33448	---	---	---	---	---	<10	---	---	---	<10	<10
TOTAL SUSPENDED SOLIDS, MG/L	---	---	---	100 %	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TEMPERATURE, °F	60.0	60.0	60.0	60.0	60.0	60.0	60.0	207.0	214.7	227.0	227.0	234.7	234.7	234.7	233.5	233.5	233.5	214.7	233.5	64.9
PRESSURE, PSIA	---	---	---	---	---	---	---	---	---	14.92	14.62	22.69	22.69	22.69	22.19	22.19	22.19	15.26	22.19	---
VISCOSITY, CENTIPOISE	1.3	28	15	---	14	2	1.4	0.4	0.4	0.013	0.013	0.016	0.016	0.016	0.3	0.013	0.013	0.013	0.3	1.1

STREAM NUMBER	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
							NOTE 11						NOTE 8	NOTE 9	NOTE 10	NOTE 8				
MASS FLOW, LB/MIN	12698.7	12672.6	26.15	241.37	215.22	26.15	2.533	83.68	86.21	112.36	7.243	105.12	0.0	12.63	0.0	0.0	12.49	83.3	83.3	16.6
SPECIFIC GRAVITY, (40°F WATER)	1.1529	1.1529	1.1529	1.1571	1.1571	1.1571	0.000800	0.00131	0.000416	0.000844	0.3204	0.000792	0.000272	0.9495	0.9495	-	0.9979	-	-	-
VOL. FLOW, GPM (LIQUID)	1320.0	1317.3	2.72	25.00	22.29	2.71	---	---	---	---	---	---	---	1.59	0.0	-	1.5	10	10	2
VOL. FLOW, ACFM (VAPOR)	---	---	---	---	---	---	50.73	1021.4	3357.8	2133.2	0.36	2126.3	0.0	- - -	- - -	0.0	- - -	-	-	-
TOTAL DISSOLVED SOLIDS, MG/L	291833	291833	291833	291833	291833	291833	---	---	---	---	---	---	---	<10	<10	-	<10	-	- - -	- - -
TOTAL SUSPENDED SOLIDS, MG/L	11523	11523	11523	11523	11523	11523	---	---	---	58.5	95 WT%	---	---	- - -	- - -	-	- - -	- - -	-	- - -
TEMPERATURE, °F	227.0	227.0	227.0	200.0	200.0	200.0	60.0	60.0	1150.0	<300.0	<300.0	<300.0	249.8	233.5	233.5	80.0	64.9	80.0	100.0	80.0
PRESSURE, PSIA	---	---	---	---	---	---	15.7	15.7	15.7	15.7	15.7	15.7	29.7	22.19	22.19	-	- - -	- - -	-	- - -
VISCOSITY, CENTIPOISE	0.7	0.7	0.7	0.8	0.8	0.8	0.012	0.014	0.04	0.022	POWDER	0.022	0.014	0.3	0.3	1.0	1.1	1.0	1.0	1.0

NOTES:

1) MAXIMUM FLOW FOR H2SO4 IS 0.24 GAL/HOUR. MINIMUM FLOW IS 0.024 GAL/HOUR.
2) MAXIMUM FLOW FOR SCALE INHIBITOR IS 0.0073 LB/MIN. MINIMUM FLOW IS 0.0024 LB/MIN.
3) MAXIMUM FLOW FOR NA2SO4 SOLUTION IS 5 LB/MIN. MINIMUM FLOW IS 1.0 LB/MIN.
4) COMPRESSOR RECYCLE LINE SHOULD BE SAME DIAMETER AS DISCHARGE LINE OF COMPRESSOR. THIS ALLOWS FULL RECYCLE AT STARTUP.
5) MAXIMUM FLOW FOR VENT IS 4.5 LB/MIN AT 22.85 PSIA AND 236°F. MINIMUM FLOW IS 2.1 LB/MIN AT 20.87 PSIA AND 230°F.
6) MAXIMUM FLOW FOR STEAM TO DEAERATOR IS 2.7 LB/MIN AT 22.16 PSIA AND 234°F. MINIMUM FLOW IS 1.4 LB/MIN AT 20.87 PSIA AND 230°F.
7) MAXIMUM FLOW FOR VENT IS 1.2 LB/MIN AT 15.26 PSIA AND 215°F. MINIMUM FLOW IS 0.5 LB/MIN AT 15.26 PSIA AND 215°F.
8) MAXIMUM STARTUP BOILER FLOW IS 600 LB/HOUR FOR A TWENTY HOUR HEAT UP PERIOD.
9) DISTILLATE LINE TO COMPRESSOR SHOULD BE SIZED FOR 3.2 GPM.
10) SPRAY SEQUENCE FOR INITIAL CONDITIONS FOR MIST ELIMINATOR WILL BE ONCE EVERY 5 MINUTES FOR A 10 SECOND DURATION; FLOW RATE WILL BE 0.05 GPM/SQ FT OF DEMISTER PAD. FINAL SETTING WILL MAINTAIN ΔP AT 0.3" WATER ABOVE "CLEAN" ΔP WHEN PLANT IS AT MAXIMUM CAPACITY.
11) THE MASS FLOW AND VOLUME FLOW OF THE NATURAL GAS IS BASED UPON A FURNACE DUTY OF 2.1 MM BTU/HR AND A NET HEATING VALUE OF 20,000 BTU/LB OF NATURAL GAS.
12) THE SEED TANK AND SEED PUMP ARE USED ONLY DURING STARTUP. THEREFORE, MASS BALANCE FLOWS ARE NOT SHOWN.

LTR	REVISIONS	BY	CHK	APP	DATE

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PROJ. ENGR.		8/7/95
MANAGER		8/11/95

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ISSUED	DATE
PRELIMINARY	8-9-95
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REVISED FOR CONSTRUCTION	

PROCESS FLOW DIAGRAM

PASCO CO. LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M3-1

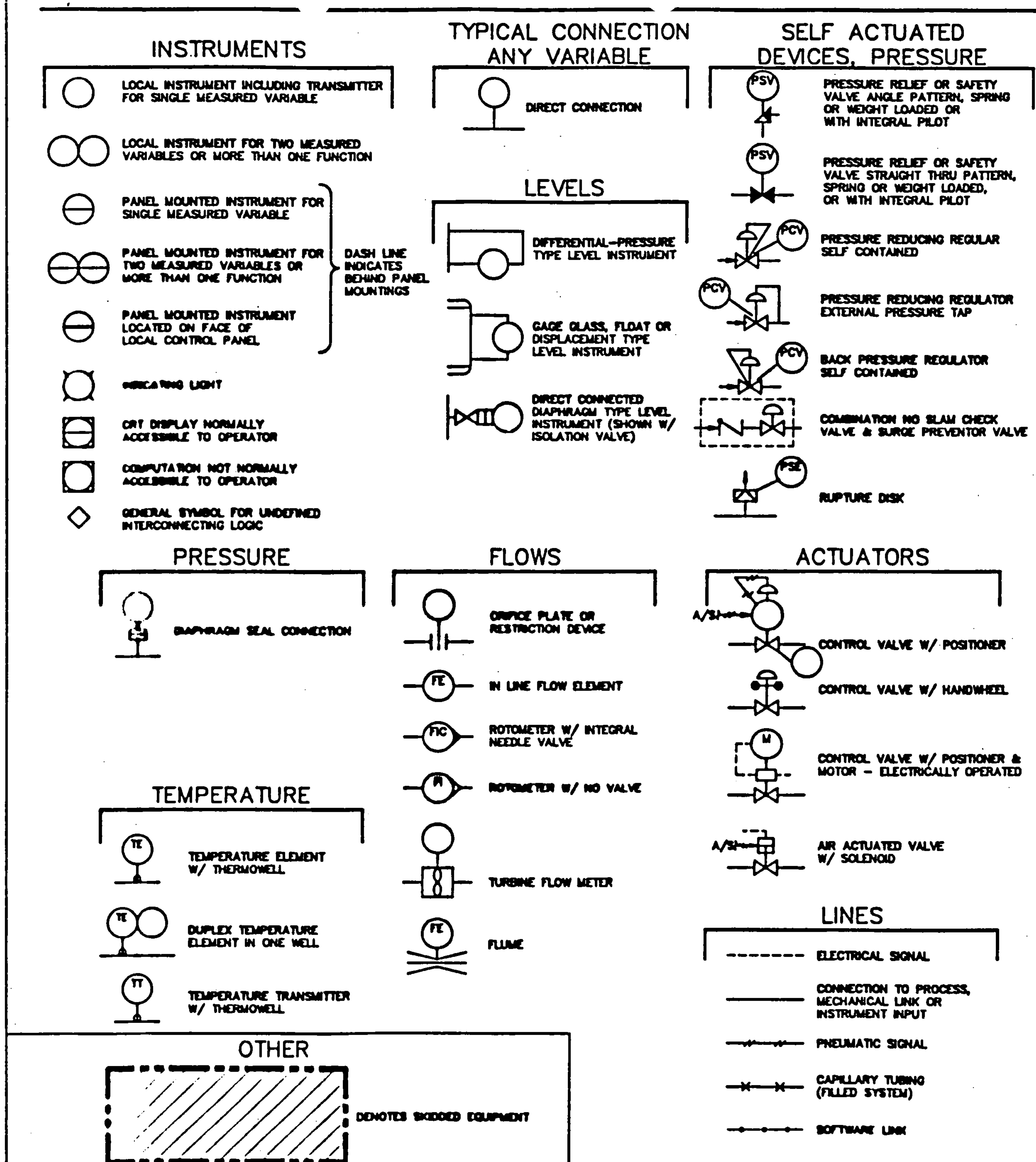
SHEET NO. 2

SCALE --

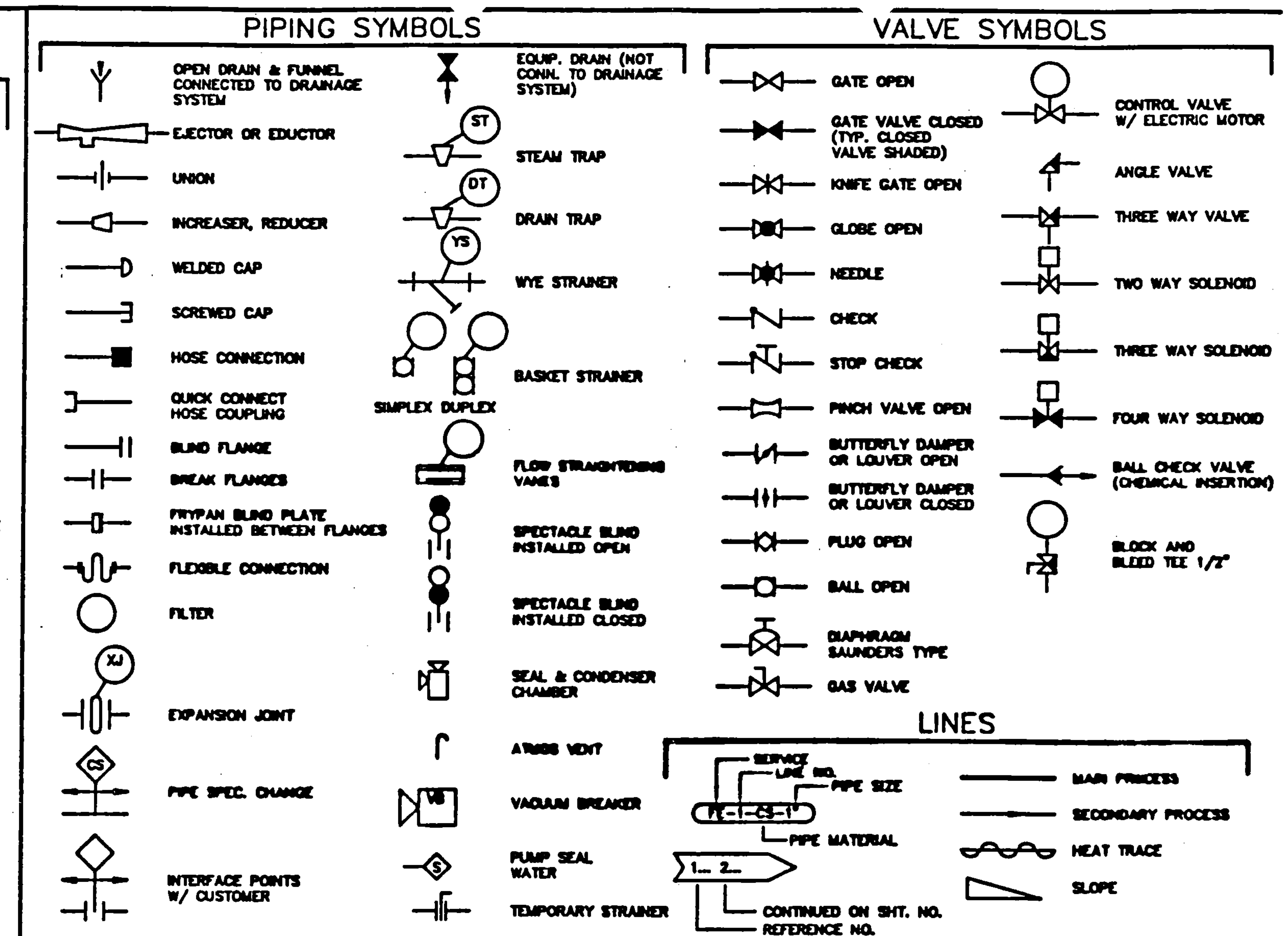
8 7 6 5 4 3 2 1

D C B A

INSTRUMENTS


INSTRUMENTS
LOCAL INSTRUMENT INCLUDING TRANSMITTER FOR SINGLE MEASURED VARIABLE
LOCAL INSTRUMENT FOR TWO MEASURED VARIABLES OR MORE THAN ONE FUNCTION
PANEL MOUNTED INSTRUMENT FOR SINGLE MEASURED VARIABLE
PANEL MOUNTED INSTRUMENT FOR TWO MEASURED VARIABLES OR MORE THAN ONE FUNCTION
DASH LINE INDICATES BEHIND PANEL MOUNTINGS
PANEL MOUNTED INSTRUMENT LOCATED ON FACE OF LOCAL CONTROL PANEL
INDICATING LIGHT
CRT DISPLAY NORMALLY ACCESSIBLE TO OPERATOR
COMPUTATION NOT NORMALLY ACCESSIBLE TO OPERATOR
GENERAL SYMBOL FOR UNDEFINED INTERCONNECTING LOGIC
TYPICAL CONNECTION ANY VARIABLE
DIRECT CONNECTION
LEVELS
DIFFERENTIAL-PRESSURE TYPE LEVEL INSTRUMENT
GAGE GLASS, FLOAT OR DISPLACEMENT TYPE LEVEL INSTRUMENT
DIRECT CONNECTED DIAPHRAGM TYPE LEVEL INSTRUMENT (SHOWN W/ ISOLATION VALVE)
SELF ACTUATED DEVICES, PRESSURE
PSV
PRESSURE RELIEF OR SAFETY VALVE ANGLE PATTERN, SPRING OR WEIGHT LOADED OR WITH INTEGRAL PILOT
PRESSURE RELIEF OR SAFETY VALVE STRAIGHT THRU PATTERN, SPRING OR WEIGHT LOADED, OR WITH INTEGRAL PILOT
PCV
PRESSURE REDUCING REGULAR SELF CONTAINED
PRESSURE REDUCING REGULATOR EXTERNAL PRESSURE TAP
BACK PRESSURE REGULATOR SELF CONTAINED
COMBINATION NO SLAM CHECK VALVE & SURGE PREVENTOR VALVE
PSE
RUPTURE DISK
PRESSURE
DIAPHRAGM SEAL CONNECTION
FLOWS
ORIFICE PLATE OR RESTRICTION DEVICE
FE
IN LINE FLOW ELEMENT
FIC
ROTOMETER W/ INTEGRAL NEEDLE VALVE
ROTOMETER W/ NO VALVE
TURBINE FLOW METER
FLUME
ACTUATORS
A/S
CONTROL VALVE W/ POSITIONER
CONTROL VALVE W/ HANDWHEEL
M
CONTROL VALVE W/ POSITIONER & MOTOR - ELECTRICALLY OPERATED
AIR ACTUATED VALVE W/ SOLENOID
TEMPERATURE
TE
TEMPERATURE ELEMENT W/ THERMOWELL
DUPLEX TEMPERATURE ELEMENT IN ONE WELL
TT
TEMPERATURE TRANSMITTER W/ THERMOWELL
LINES
ELECTRICAL SIGNAL
CONNECTION TO PROCESS, MECHANICAL LINK OR INSTRUMENT INPUT
PNEUMATIC SIGNAL
CAPILLARY TUBING (FILLED SYSTEM)
SOFTWARE LINK
OTHER
DENOTES SKIDDED EQUIPMENT

PIPING & VALVES


PIPING SYMBOLS
OPEN DRAIN & FUNNEL CONNECTED TO DRAINAGE SYSTEM
EJECTOR OR EDUCTOR
UNION
INCREASER, REDUCER
WELDED CAP
SCREWED CAP
HOSE CONNECTION
QUICK CONNECT HOSE COUPLING
BLIND FLANGE
BREAK FLANGES
FRYPAN BLIND PLATE INSTALLED BETWEEN FLANGES
FLEXIBLE CONNECTION
FILTER
XJ
EXPANSION JOINT
CS
PIPE SPEC. CHANGE
INTERFACE POINTS W/ CUSTOMER
EQUIP. DRAIN (NOT CONN. TO DRAINAGE SYSTEM)
ST
STEAM TRAP
DT
DRAIN TRAP
YS
WYE STRAINER
SIMPLEX DUPLEX
BASKET STRAINER
FLOW STRAIGHTENING VANES
SPECTACLE BLIND INSTALLED OPEN
SPECTACLE BLIND INSTALLED CLOSED
SEAL & CONDENSER CHAMBER
ATMOS VENT
VB
VACUUM BREAKER
S
PUMP SEAL WATER
TEMPORARY STRAINER
VALVE SYMBOLS
GATE OPEN
GATE VALVE CLOSED (TYP. CLOSED VALVE SHADED)
KNIFE GATE OPEN
GLOBE OPEN
NEEDLE
CHECK
STOP CHECK
PINCH VALVE OPEN
BUTTERFLY DAMPER OR LOUVER OPEN
BUTTERFLY DAMPER OR LOUVER CLOSED
PLUG OPEN
BALL OPEN
DIAPHRAGM SAUNDERS TYPE
GAS VALVE
CONTROL VALVE W/ ELECTRIC MOTOR
ANGLE VALVE
THREE WAY VALVE
TWO WAY SOLENOID
THREE WAY SOLENOID
FOUR WAY SOLENOID
BALL CHECK VALVE (CHEMICAL INSERTION)
BLOCK AND BLEED TEE 1/2"
LINES
SERVICE
LINE NO.
PIPE SIZE
PE-1-CS-1"
PIPE MATERIAL
1... 2...
CONTINUED ON SHT. NO.
REFERENCE NO.
MAIN PROCESS
SECONDARY PROCESS
HEAT TRACE
SLOPE

ABBREVIATIONS & MISCELLANEOUS

PIPING SERVICE & ABBREVIATION LEGEND

AC AIR CLOSES
AO AIR OPENS
A/S INSTRUMENT AIR SUPPLY
CS CHANGE SPECIFICATION
FC FAIL CLOSE ON AIR SUPPLY LOSS
FD FLOOR DRAINAGE SYSTEM
FO FAIL OPEN
NC NORMALLY CLOSED
NO NORMALLY OPEN
P/S PURGE WATER SUPPLY
RTD RESISTANCE TEMPERATURE DETECTOR
SP SAMPLE VALVE (1/2" SIZE UNLESS OTHERWISE NOTED)
T/C THERMOCOUPLE
V VENTED TO ATMOSPHERE
W/S WATER SUPPLY
CO CHAIN OPERATED
TDS TOTAL DISSOLVED SOLIDS
TS TOTAL SOLIDS
TSS TOTAL SUSPENDED SOLIDS

AS: AUXILIARY STEAM
CD: STEAM CONDENSATE
CL: SCALE INHIBITOR
DR: DRAIN
DW: DEAERATOR WATER
EC: EVAPORATOR CONCENTRATE
EP: EVAPORATOR PRODUCT
ER: EVAPORATOR RECIRCULATION
EV: EVAPORATOR VAPOR
FE: FEED
HS: SULFURIC ACID
IA: INSTRUMENT AIR
LO: LUBE OIL
NG: NATURAL GAS
SA: SERVICE AIR
SEW: SEAL WATER
SS: SODIUM SULFATE
SW: SERVICE WATER
VT: VENT

NOTES

1. ALL INSTRUMENTATION SYMBOLS & IDENTIFICATION ARE PER THE INSTRUMENT SOCIETY OF AMERICA (I.S.A.) STANDARD-LATEST REVISION ANSI Y32.20.1975.
2. UNLESS OTHERWISE NOTED, SAMPLE AND BLEED VALVES WILL BE 0.5", AND QUICK CONNECT HOSE COUPLINGS (FLUSHES) WILL BE 1".

MATERIAL:

A20: ALLOY 20
ALX: AL6XN
CS: CARBON STEEL
CU: COPPER
CPVC: CHLORINATED POLYVINYLCHLORIDE
SP: SPECIAL DESIGN
SS1: 316L STAINLESS STEEL

LTR	REVISIONS	BY	CHK	APP	DATE
A	RE-ISSUED FOR COMMENT	JGV	MCC	MTW	
B	RE-ISSUED AS REV'D	EKK			

PROPRIETARY
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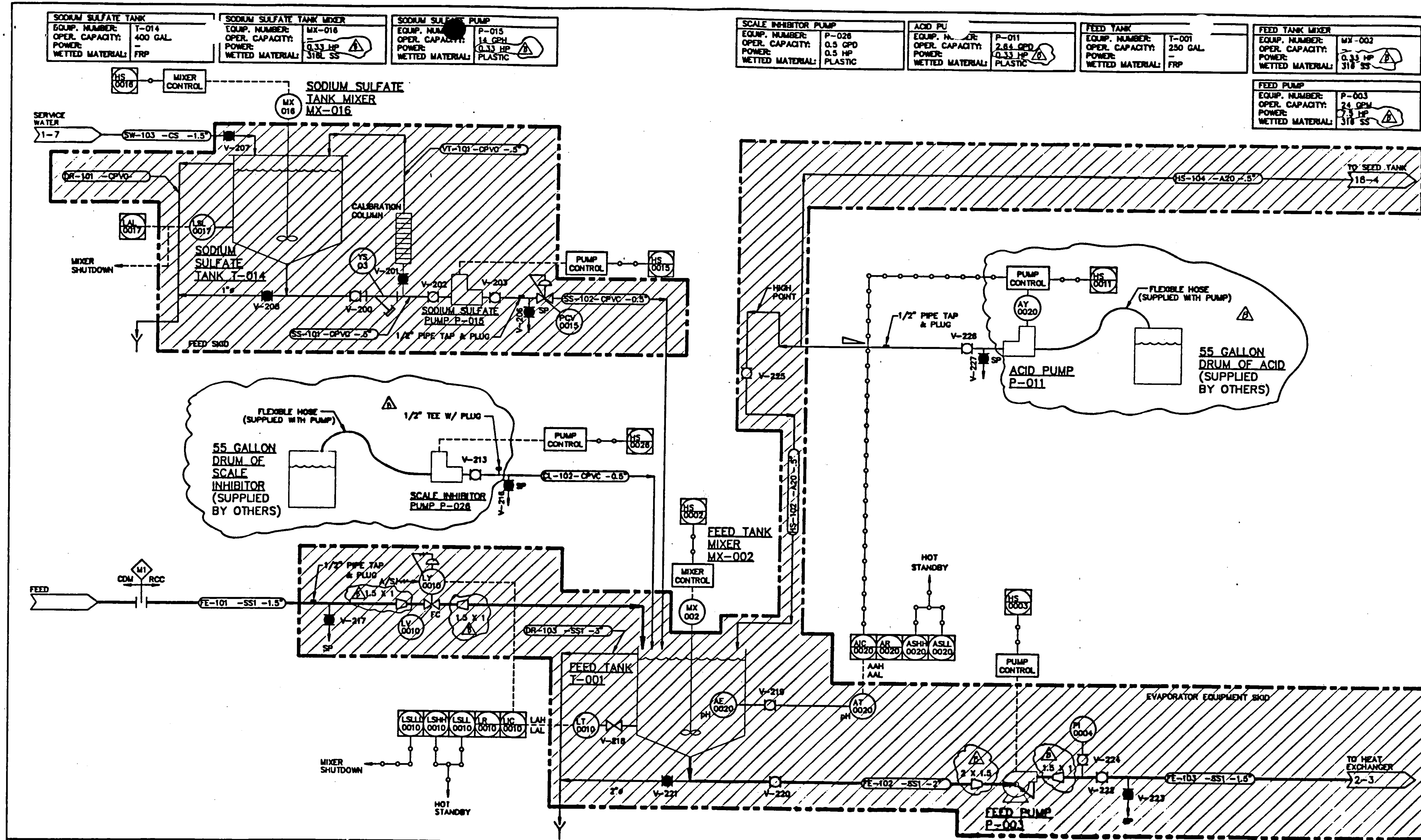
ENG RECORD	DRAWING STATUS	
ROTH	M.E. SPANN	
M. MCCLURKIN	M.E. SPANN	
M. MCCLURKIN		B
J.L. DUNN	RELEASED FOR CONSTRUCTION	

P. & I.D. LEGEND
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM
CUSTOMER ORDER NO. 94-2168
RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M4-1
SHEET NO. 1 OF 7
REV B


SODIUM SULFATE TANK
EQUIP. NUMBER: T-014
OPER. CAPACITY: 400 GAL.
POWER: -
WETTED MATERIAL: FRP
SODIUM SULFATE TANK MIXER
EQUIP. NUMBER: MX-016
OPER. CAPACITY: -
POWER: 0.33 HP
WETTED MATERIAL: 316L SS
SODIUM SULFATE PUMP
EQUIP. NUMBER: P-015
OPER. CAPACITY: 14 GPH
POWER: 0.33 HP
WETTED MATERIAL: PLASTIC
SCALE INHIBITOR PUMP
EQUIP. NUMBER: P-026
OPER. CAPACITY: 0.5 GPD
POWER: 0.5 HP
WETTED MATERIAL: PLASTIC
ACID PUMP
EQUIP. NUMBER: P-011
OPER. CAPACITY: 2.64 GPD
POWER: 0.33 HP
WETTED MATERIAL: PLASTIC
FEED TANK
EQUIP. NUMBER: T-001
OPER. CAPACITY: 250 GAL.
POWER: -
WETTED MATERIAL: FRP
FEED TANK MIXER
EQUIP. NUMBER: MX-002
OPER. CAPACITY: -
POWER: 0.33 HP
WETTED MATERIAL: 316 SS
FEED PUMP
EQUIP. NUMBER: P-003
OPER. CAPACITY: 24 GPM
POWER: 7.5 HP
WETTED MATERIAL: 316 SS
MIXER CONTROL
SODIUM SULFATE TANK MIXER MX-016
SERVICE WATER
1-7
SW-103 -CS -1.5"
V-207
VT-101 -CPVC -.5"
DR-101 -CPVC
CALIBRATION COLUMN
SODIUM SULFATE TANK T-014
MIXER SHUTDOWN
PUMP CONTROL
V-201
V-202
V-203
V-205
V-200
SODIUM SULFATE PUMP P-015
SS-102 -CPVC -0.5"
SS-101 -CPVC -.5"
1/2" PIPE TAP & PLUG
FEED SKID
FLEXIBLE HOSE (SUPPLIED WITH PUMP)
1/2" TEE W/ PLUG
55 GALLON DRUM OF SCALE INHIBITOR (SUPPLIED BY OTHERS)
V-213
CL-102 -CPVC -0.5"
SCALE INHIBITOR PUMP P-026
FEED TANK MIXER MX-002
FEED
CDM
RCC
FE-101 -SS1 -1.5"
1/2" PIPE TAP & PLUG
V-217
DR-103 -SS1 -3"
FEED TANK T-001
MIXER SHUTDOWN
HOT STANDBY
V-218
V-219
V-221
V-220
FE-102 -SS1 -2"
FEED PUMP P-003
V-224
V-222
V-223
FE-103 -SS1 -1.5"
TO HEAT EXCHANGER
2-3
EVAPORATOR EQUIPMENT SKID
HIGH POINT
V-225
HS-102 -A20 -.5"
HS-104 -A20 -.5"
TO SEED TANK
18-4
1/2" PIPE TAP & PLUG
V-226
V-227
ACID PUMP P-011
FLEXIBLE HOSE (SUPPLIED WITH PUMP)
55 GALLON DRUM OF ACID (SUPPLIED BY OTHERS)
HOT STANDBY

LTR	REVISIONS	BY	CHK	APP	DATE
A	GENERAL REVISIONS	JDV	MMc	MTW	
B	GENERAL REVISIONS	RLR			

PROPRIETARY

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ENG RECORD: ROTH; M. MCCLURKIN; M. MCCLURKIN; J.L. DUNN

DRAWING STATUS: M.E. SPANN; M.E. SPANN

P. & I.D.
PRETREATMENT SYSTEM

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M4-1

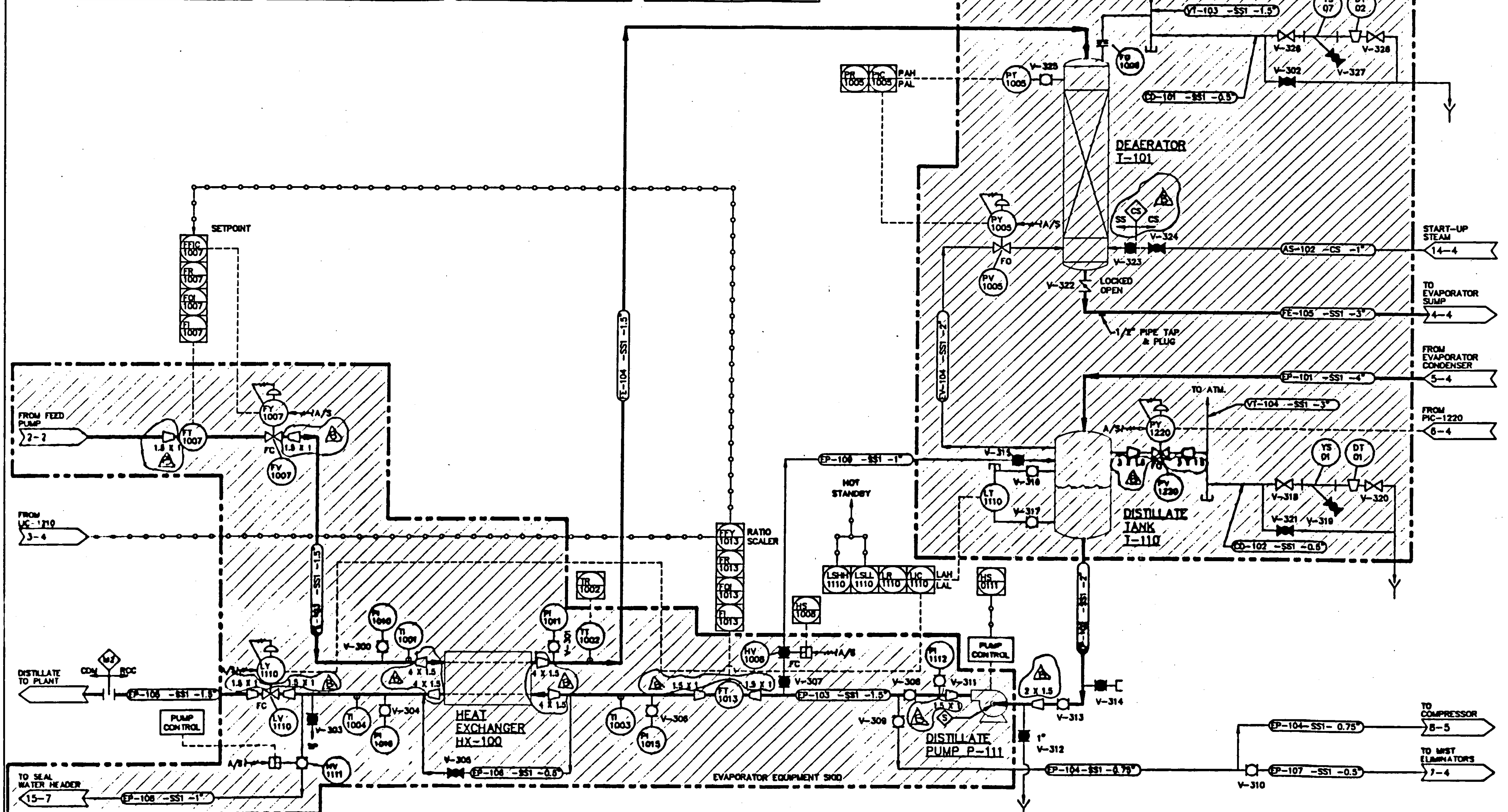
SHEET NO. 2

HEAT EXCHANGER	
EQUIP. NUMBER:	HX-100
OPER. CAPACITY:	–
POWER:	–
WETTED MATERIAL:	TITANIUM

DISTILLATE PUMP	
EQUIP. NUMBER:	P-111
OPER. CAPACITY:	22 GPM
POWER:	3 HP
WETTED MATERIAL:	316 SS

[illegible]LATE TANK	
EQUIP. NUMBER:	T-110
OPER. CAPACITY:	150 GAL.
POWER:	–
WETTED MATERIAL:	316L SS

DEAERATOR	
EQUIP. NUMBER:	T-101
OPER. CAPACITY:	–
POWER:	–
WETTED MATERIAL:	317L SS



LTR	REVISIONS	BY	CHK	APP	DATE
A	GENERAL REVISIONS	JDV	MAG	MTW	
B	GENERAL REVISIONS	RLR			

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ENG RECORD	DRAWING STATUS ISSUED	DATE
ROTH	M.E. SPANN	
M. MCCLURKIN	M.E. SPANN	
M. MCCLURKIN	[signature] B	5/14/96
J.L. DUNN		

P. & I.D.
FEED & DISTILLATE SYSTEM

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

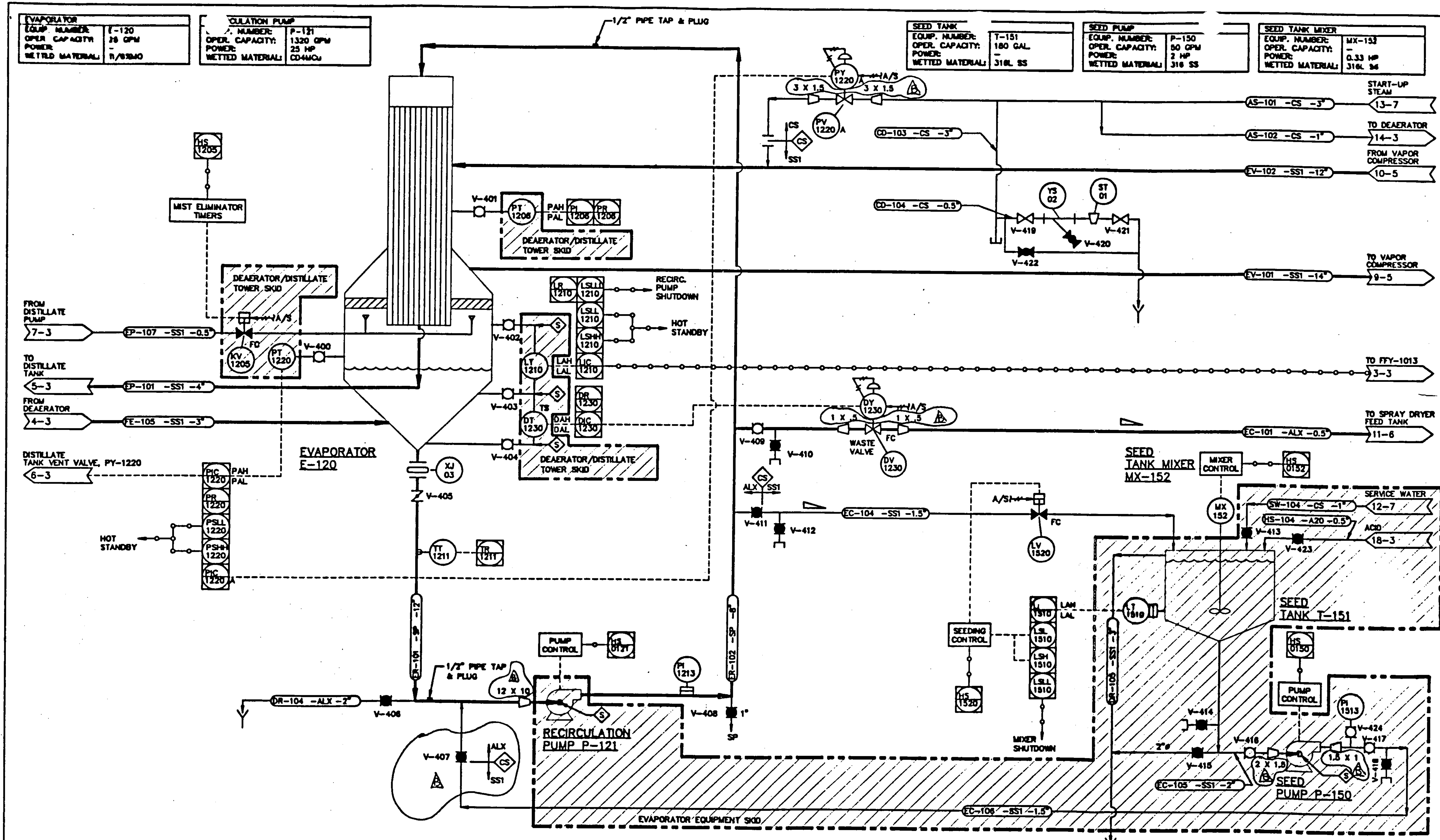
CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

615-M4-1

3

B


EVAPORATOR
EQUIP. NUMBER: E-120
OPER. CAPACITY: 25 GPM
WETTED MATERIAL: Ti/6%MO
CULATION PUMP
P-121
OPER. CAPACITY: 1320 GPM
POWER: 25 HP
WETTED MATERIAL: CD4MCu
1/2" PIPE TAP & PLUG
SEED TANK
EQUIP. NUMBER: T-151
OPER. CAPACITY: 180 GAL.
WETTED MATERIAL: 316L SS
SEED PUMP
EQUIP. NUMBER: P-150
OPER. CAPACITY: 50 GPM
POWER: 2 HP
WETTED MATERIAL: 316 SS
SEED TANK MIXER
EQUIP. NUMBER: MX-152
POWER: 0.33 HP
WETTED MATERIAL: 316L SS
START-UP STEAM
13-7
AS-101 -CS -3"
TO DEAERATOR
14-3
AS-102 -CS -1"
FROM VAPOR COMPRESSOR
10-5
EV-102 -SS1 -12"
CD-103 -CS -3"
CD-104 -CS -0.5"
V-419
V-420
V-421
V-422
TO VAPOR COMPRESSOR
9-5
EV-101 -SS1 -14"
MIST ELIMINATOR TIMERS
DEAERATOR/DISTILLATE TOWER SKID
FROM DISTILLATE PUMP
7-3
EP-107 -SS1 -0.5"
TO DISTILLATE TANK
5-3
EP-101 -SS1 -4"
FROM DEAERATOR
4-3
FE-105 -SS1 -3"
DISTILLATE TANK VENT VALVE, PY-1220
6-3
EVAPORATOR E-120
V-400
V-401
V-402
V-403
V-404
V-405
RECIRC. PUMP SHUTDOWN
HOT STANDBY
TO FFY-1013
3-3
TO SPRAY DRYER FEED TANK
11-6
EC-101 -ALX -0.5"
WASTE VALVE
V-409
V-410
V-411
V-412
EC-104 -SS1 -1.5"
SEED TANK MIXER MX-152
MIXER CONTROL
SERVICE WATER
12-7
SW-104 -CS -1"
HS-104 -A20 -0.5"
ACID
18-3
V-413
V-423
SEED TANK T-151
SEEDING CONTROL
MIXER SHUTDOWN
PUMP CONTROL
V-414
V-415
V-416
V-417
V-424
SEED PUMP P-150
EC-105 -SS1 -2"
EC-106 -SS1 -1.5"
EVAPORATOR EQUIPMENT SKID
RECIRCULATION PUMP P-121
DR-104 -ALX -2"
V-406
V-407
V-408
HOT STANDBY

LTR	REVISIONS	BY	CHK	APP	DATE
A	GENERAL REVISIONS	JGV	MMc	MTW	
B	GENERAL REVISIONS	RLR			5/6/96

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ENG RECORD	DRAWING STATUS	DATE
ROTH	ISSUED	
M. MCCLURKIN	M.E. SPANN	9/6/95
M. MCCLURKIN	M.E. SPANN	10/25/95
J.L. DUNN		5/6/96

P. & I.D.
EVAPORATOR

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

DRAWING NO 615-M4-1

SHEET NO 4

REV B

VAPOR COMPRESSOR	
EQUIP. NUMBER:	K-131
OPER. CAPACITY:	5700 ICFM
POWER:	350 HP
WETTED MATERIAL:	CI

AUXILIARY OIL PUMP	
EQUIP. NUMBER:	P-133
OPER. CAPACITY:	N/A
POWER:	1.5 HP
WETTED MATERIAL:	CI

INLET SILENCER	
EQUIP. NUMBER:	C-132A
OPER. CAPACITY:	–
POWER:	–
WETTED MATERIAL:	316L SS

OUTLET SILENCER	
EQUIP. NUMBER:	C-132B
OPER. CAPACITY:	–
POWER:	–
WETTED MATERIAL:	316L SS

EVAPORATOR SEAL LEG	
EQUIP. NUMBER:	E-130
OPER. CAPACITY:	–
POWER:	N/A
WETTED MATERIAL:	316L SS

TO EVAPORATOR 10-4

EV-102 -SS1 -12"

HIC 1310

HY 1310

I/A/S

HV 1310

FO

EV-103 -SS1 -12"

FROM EVAPORATOR 9-4

EV-101 -SS1 -14"

V-522

SW-109 -CS -0.5"

FROM SERVICE WATER 19-7

EVAPORATOR SEAL LEG E-130

V-521

DR-110 -SS1 -0.5"

DR-111 -SS1 -1"

HS 0131

COMPRESSOR CONTROL LOGIC

TSH 1308

TSHH 1308

PSL 1306

PSLL 1306

LUBE OIL COOLER

TI 1319

1 X .75

V-515

RCC M5 CDM COOLING WATER

SW-106 -CPVC -1"

V-516

PI 1311

SW-107 -CPVC -1"

DR-112-CPVC- 0.75"

V-517

V-523

V-500

V-501

6"

MOTOR

GEAR BOX

MAIN PUMP

GEARBOX OIL COOLER

PSHL 1307

AUX OIL PUMP/P-133 LUBE OIL SYSTEM

V-524

V-514

6"

V-513

VENT TO ATMOSPHERE

PSV 1301

6"

TSHH 1302

DPSH 1303

TDSHH 1304

TSH 1302

DPSH 1303

TDSH 1304

TSHH 1305

TSH 1305

DR-113 -CPVC -1"

FSL 1312

S

I/A/S

FC

KV 1313

.75 X .5

FI 1314

.75 X .5

V-518

FROM DISTILLATE PUMP 8-3

EP-104 -SS1- 0.75"

VT-105 -SS1 -8"

DR-117 -SS1 -1"

V-509

.75 X .5

V-520

XJ 05

XJ 04

INLET SILENCER C-132A

OUTLET SILENCER C-132B

V-502

V-512

LAHH 1317

LSHH 1317

LG 1317

LSH 1316

LG 1318

V-503

V-511

VALVE CONTROL

VAPOR COMPRESSOR PACKAGE

PI 1328

.5 X .25

S

I/A/S

KV 1315

RUST INHIBITOR DISPENSER T-135

V-504

FC

S

I/A/S

HS 1316

V-508

V-505

V-507

V-506

V-519

.5 X .25

RUST INHIBITOR CONTROL LOGIC

LO-101 -SS1- 0.5"

V-510

LV 1316

KV 1319

VAPOR COMPRESSOR K-131

DR-108 -SS1 -1.5"

DR-118 -SS1 -1.5"

DR-114 -SS1 -0.75"

DR-107 -SS1 -0.75"

DR-115 -SS1 -0.75"

DR-106 -SS1 -1.5"

LTR	REVISIONS	BY	CHK	APP	DATE
A	GENERAL REVISIONS	JCV	MMc	MTW	9/6/95
B	GENERAL REVISIONS	RLR	MMc	MTW	5/10/96
C	ADDED DR-118, MODIFY SIZE OF DR-107, 114, AND 115	THN	BDV.	BDV.	9/6/96

ENG RECORD	
DRAWN	ROTH
CHECKED	M. MCCLURKIN
ENGR. APPR.	M. MCCLURKIN 9/1/95
APPROVED	J.L. DUNN 9/1/95

DRAWING STATUS		
ISSUED		DATE
PRELIMINARY	M.E. SPANN	9/6/95
FOR COMMENTS AND/OR APPROVAL	M.E. SPANN	10/25/95
APPROVED FOR CONSTRUCTION	M.E. SPANN B	5/10/96
REVISED FOR CONSTRUCTION	C	9/6/96

P. & I.D.
VAPOR COMPRESSOR

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M4-1

SHEET NO 5

SCALE --

REV C

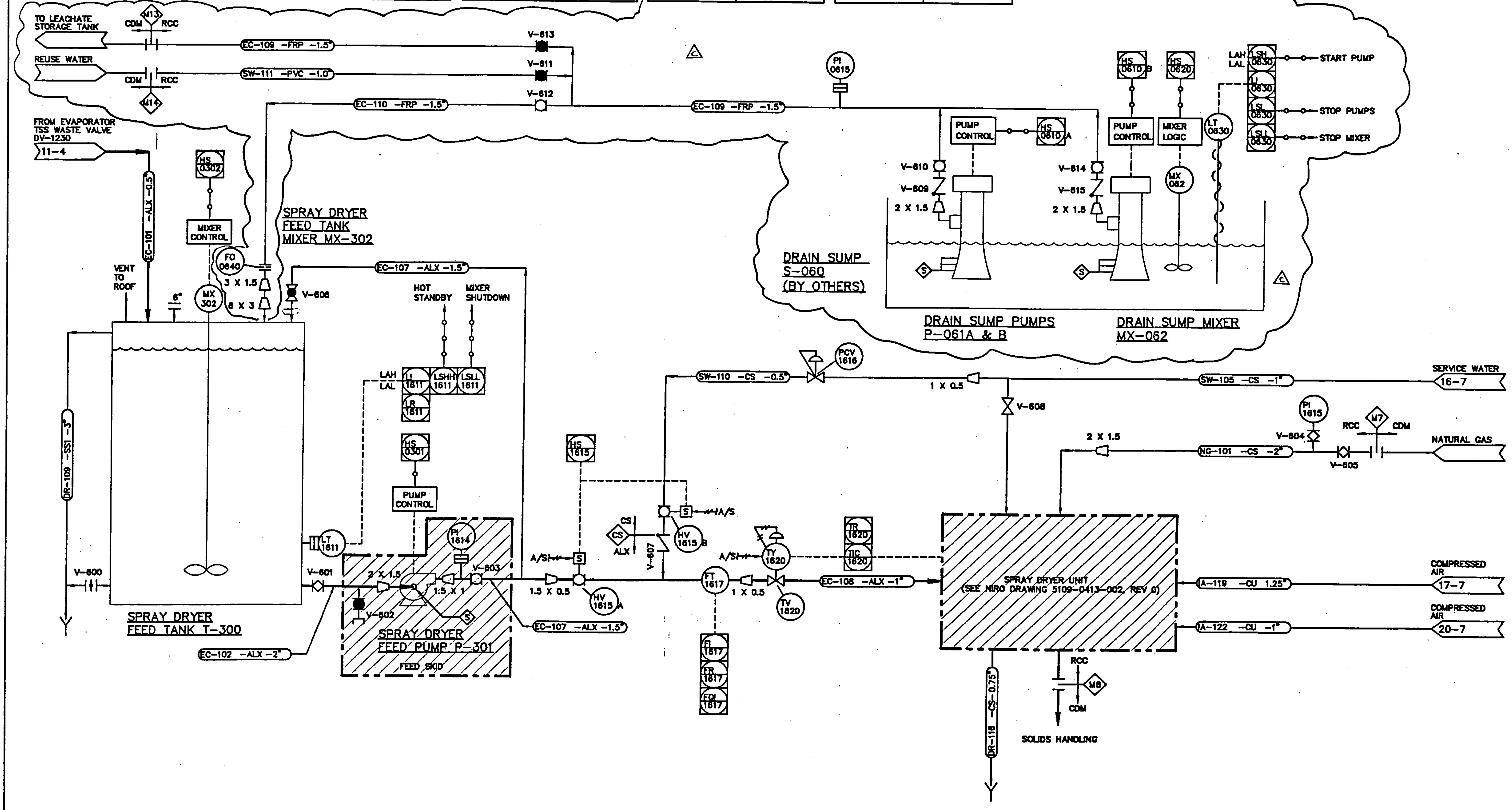
SPRAY DRYER FEED TANK	
EQUIP. NUMBER:	T-300
OPER. CAPACITY:	8000 GAL.
POWER:	–
WETTED MATERIAL:	FRP

SPRAY DRYER FEED PUMP	
EQUIP. NUMBER:	P-301
OPER. CAPACITY:	25 GPM
POWER:	2 HP
WETTED MATERIAL:	CD4MCu

SPRAY DRYER FEED TANK MIXER	
EQUIP. NUMBER:	MX-302
OPER. CAPACITY:	–
POWER:	1.5 HP
WETTED MATERIAL:	ALLOY C-276

DRAIN SUMP PUMPS	
EQUIP. NUMBER:	P-061A & B
OPER. CAPACITY:	40 GPM
POWER:	3 HP
WETTED MATERIAL:	FRP

DRAIN SUMP MIXER	
EQUIP. NUMBER:	MX-062
OPER. CAPACITY:	–
POWER:	0.75 HP
WETTED MATERIAL:	ALLOY C-276



LTR	REVISIONS	BY	CHK	APP	DATE
A	GENERAL REVISIONS	JGV	MMc	MTW	
B	GENERAL REVISIONS	RLR	MMc	MTW	
C	ADDED DRAIN SUMP SYSTEM	THN	BCK		9/6/96

ENG RECORD	DRAWING STATUS ISSUED	DATE
ROTH	M.E. SPANN (PRELIMINARY)	9/6/95
M. MCCLURKIN	M.E. SPANN (FOR COMMENTS AND/OR APPROVAL)	10/25/95
M. MCCLURKIN 9/1/95	M.E. SPANN (APPROVED FOR CONSTRUCTION) B	5/10/96
J.L. DUNN 9/1/95	(REVISED FOR CONSTRUCTION) C	9/6/96

P. & I.D.
SPRAY DRYER

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M4-1

SHEET NO 6

SCALE --

REV C

START-UP BOILER	
EQUIP. NUMBER:	B-101
OPER. CAPACITY:	690 LB/HR@15psig
POWER:	–
WETTED MATERIAL:	–

FROM DISTILLATE HEADER 15-3 — EP-108 -SS1 -1"

EVAPORATOR EQUIPMENT SKID

SERVICE WATER — CDM M9 RCC — SW-101 -CS -1.5" — V-700

TO SPRAY DRYER 16-6 — SW-105 -CS -1"

TO EVAPORATOR SEAL LEG 19-5 — SW-109 -CS -0.5"

SEW-109 -CS -0.5"

INSTRUMENT AIR — CDM M10 RCC — A-101 -CU-1.25" — V-715

CLEAN CONDENSATE — CDM M11 RCC — V-732 — V-733 — YS 08 — SW-108 -CS -2"

NATURAL GAS — CDM M12 RCC — V-731 — NG-102 -CS -2"

V-706 V-707 SEW-101 -SS1 -1" PI 0304 PSL 0303 PAI 0303 V-708 PCV 0302 V-709

V-701 YS 05 PCV 0300 1.5 X 1 1.5 X 1 PI 0301 V-703 V-704 V-705 V-740 V-702 SW-102 -CS -1.5"

DEAERATOR/DISTILLATE TOWER SKID

V-710 — SEW-102 -SS1 -0.5" — 0.5 X 0.25 — FIC 0310 — TO EVAPORATOR LEVEL TRANSMITTER PURGE
SEW-103 -SS1 -0.5" — 0.5 X 0.25 — FIC 0311 — TO EVAPORATOR LEVEL TRANSMITTER PURGE
SEW-104 -SS1 -0.5" — 0.5 X 0.25 — FIC 0312 — TO EVAPORATOR DENSITY TRANSMITTER PURGE

V-711 — SEW-105 -SS1 -0.5" — 0.5 X 0.25 — FIC 0313 — TO SPRAY DRYER FEED PUMP SEAL WATER PURGE

FEED SKID

V-712 — SEW-106 -SS1 -0.5" — FIC 0314 — TO RECIRCULATION PUMP SEAL WATER PURGE
V-713 — SEW-107 -SS1 -0.5" — 0.5 X 0.25 — FIC 0315 — TO SEED PUMP SEAL WATER PURGE
V-714 — SEW-108 -SS1 -0.5" — 0.5 X 0.25 — FIC 0316 — TO DISTILLATE PUMP SEAL WATER PURGE

SW-103 -CS -1.5" — TO SODIUM SULFATE TANK 1-2
SW-104 -CS -1.5" — TO SEED TANK 12-4

EVAPORATOR EQUIPMENT SKID

A/S S — KV 0625 — V-750 — SEW-110 -CS -0.5" — 0.5 X 0.25 — FIC 0317 — TO DRAIN SUMP PUMP P-061A SEAL WATER PURGE

A/S S — SUMP PUMP CONTROL LOGIC — KV 0626 — V-751 — SEW-111 -CS -0.5" — 0.5 X 0.25 — FIC 0318 — TO DRAIN SUMP PUMP P-061B SEAL WATER PURGE

PSL 0320 PAL 0320 — 1/2" PIPE TAP & PLUG — V-741

1 1/4"-CS — 14"-STYLE M – TYPE B GAS VENT PIPE — COMBUSTION GAS VENT

PSV 0345 — SET POINT 30 PSIG — V-739 V-745

HS 0358 — CONTROL SYSTEM — BURNER — PSH 0355 — PI 0354 — LG 0358 — LOW WATER CUTOFF & FEED CONTROL

V-734 — MAIN GAS LINE — V-736 — PCV 0342 — FV 0343 — FV 0353 — V-735 — PILOT GAS LINE — PCV 0345 — LV 0344

V-737 — 3/4" CONTROL BLOWDOWN — V-738 — SLOW OPEN BLOW DOWN

BOILER SHELL SECTION B-101

START-UP BOILER PACKAGE

FC — LV 0340 — 1.5 X 0.5 — 2 X 0.5

A-124 -CU -0.5"	V-713	A/S	KV-0628 SH. 7
A-123 -CU -0.5"	V-714	A/S	KV-0625 SH. 7
A-112 -CU -0.5"	V-726	A/S	KY-1313 SH. 5
A-113 -CU -0.5"	V-727	A/S	HY-1310 SH. 5
A-114 -CU -0.5"	V-728	A/S	LV-1316 SH. 5
A-120 -CU -0.5"	V-747	A/S	KV-1315 SH. 5

EVAPORATOR EQUIPMENT SKID

A-102 -CU -0.5"	V-718	A/S	LY-0010 SH. 2
A-104 -CU -0.5"	V-718	A/S	HY-1008 SH. 3
A-105 -CU -0.5"	V-719	A/S	LY-1110 SH. 3
A-106 -CU -0.5"	V-720	A/S	LY-1007 SH. 3
A-118 -CU -0.5"	V-743	A/S	HV-1111 SH. 3

A-110 -CU -0.5"	V-724	A/S	DV-1230 SH. 4
A-111 -CU -0.5"	V-725	A/S	LV-1520 SH. 4

DEAERATOR/DISTILLATE TOWER SKID

A-103 -CU -0.5"	V-717	A/S	PY-1005 SH. 3
A-107 -CU -0.5"	V-721	A/S	PY-1220 SH. 3
A-108 -CU -0.5"	V-722	A/S	KV-1205 SH. 3

A-109 -CU -0.5"	V-723	A/S	PY-1220A SH. 4
A-115 -CU -0.5"	V-729	A/S	HV-1615A SH. 6
A-116 -CU -0.5"	V-744	A/S	HV-1615B SH. 6
A-117 -CU -0.5"	V-742	A/S	TY-1620 SH. 6
A-119 -CU-1.25"	V-749		TO SPRAY DRYER 17-6
A-122 -CU 1"	V-748		TO SPRAY DRYER 20-6
AS-101 -CS -3"			START-UP STEAM 13-4

LTR	REVISIONS	BY	CHK	APP	DATE
A	GENERAL REVISIONS	JGV	MMc	MTW	9/25/95
B	GENERAL REVISIONS	RJR	MMc	MTW	5/6/96
C	ADDED DRAIN SUMP PUMPS SEAL WATER(SEW-109,110, & 111)	THN	BDC	[illegible]	7/16/96

ENG RECORD		
DRAWN	ROTH	
CHECKED	M. MCCLURKIN	
PROJ ENGR	M. MCCLURKIN	9/8/95
APPROVED	J.L. DUNN	9/8/95

DRAWING STATUS ISSUED		DATE
PRELIMINARY	M.E. SPANN	9/8/95
FOR COMMENTS AND/OR APPROVAL	M.E. SPANN	10/25/95
APPROVED FOR CONSTRUCTION	M.E. SPANN B	5/10/96
AS BUILT FOR CONSTRUCTION	C	7/16/96

P. & I.D.
UTILITIES

DRAWING NO. 615-M4-1

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

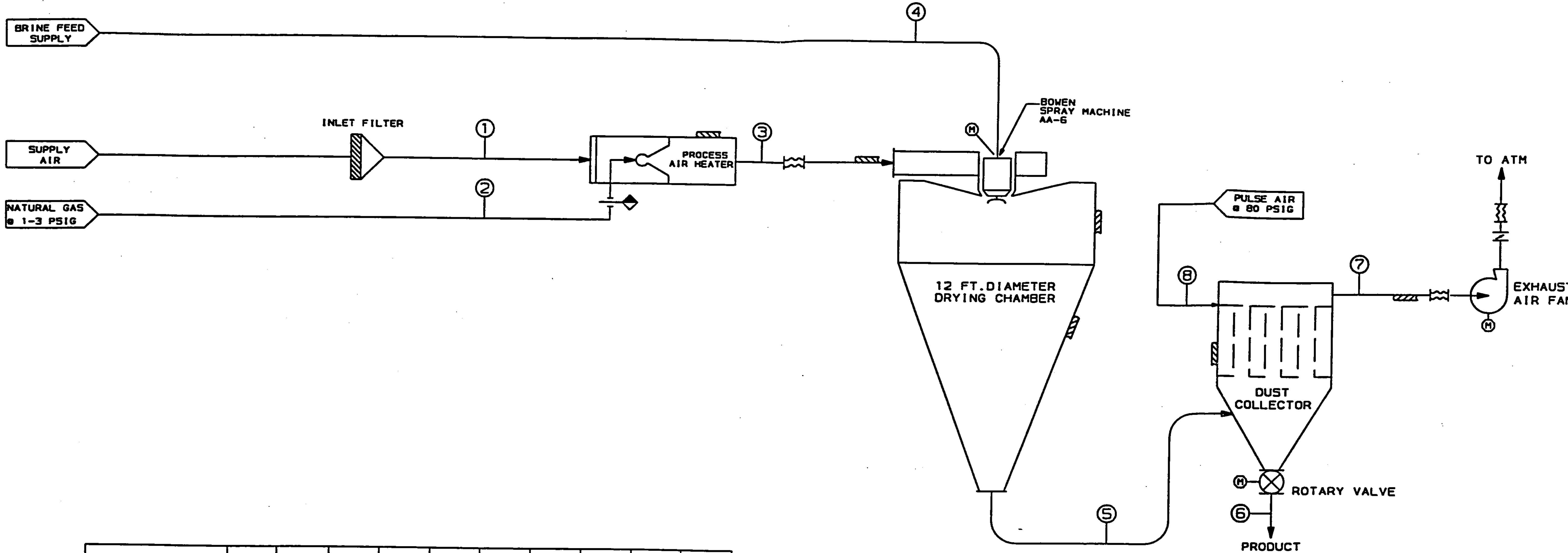
SHEET NO. 7

CUSTOMER ORDER NO. 94-2168

RESOURCES CONSERVATION COMPANY

SCALE --

REV C



STREAM NUMBER	1	2	3	4	5	6	7	8	9	10
	SUPPLY AIR	NATURAL GAS	PROCESS GAS	FEED	DRYER OUTLET	PRODUCT	EXHAUST GAS	FILTER PULSE AIR		
DRY AIR, LB/HR	6385.0	89.9	6296.8		6296.8		6306.8	10		
WATER VAPOR, LB/HR	45.0		223.1		1420.5		1420.5			
DRY SOLIDS, LB/HR				448.5	448.5	446.2	2.3			
WATER, LB/HR				1276.5	79.1	78.8	0.3			
TOTAL WEIGHT, LB/HR	6430.0	89.9	6519.9	1725.0	8244.9	525.0	7729.9	10		
PRESSURE, "WC (PSIG)	-1	(3)	-3	1	-7	0	-14	(80)		
TEMPERATURE, °F	70	70	1100	200	340	331	331	70		
DENSITY, LB/FT³	0.0774	0.0537	0.0257	71.7	0.0441		0.0438	0.566		
VOLUME FLOW, ACFM(GPM)	1385	27.9	4219	(3)	2917		2940	0.3		
COMMENTS										

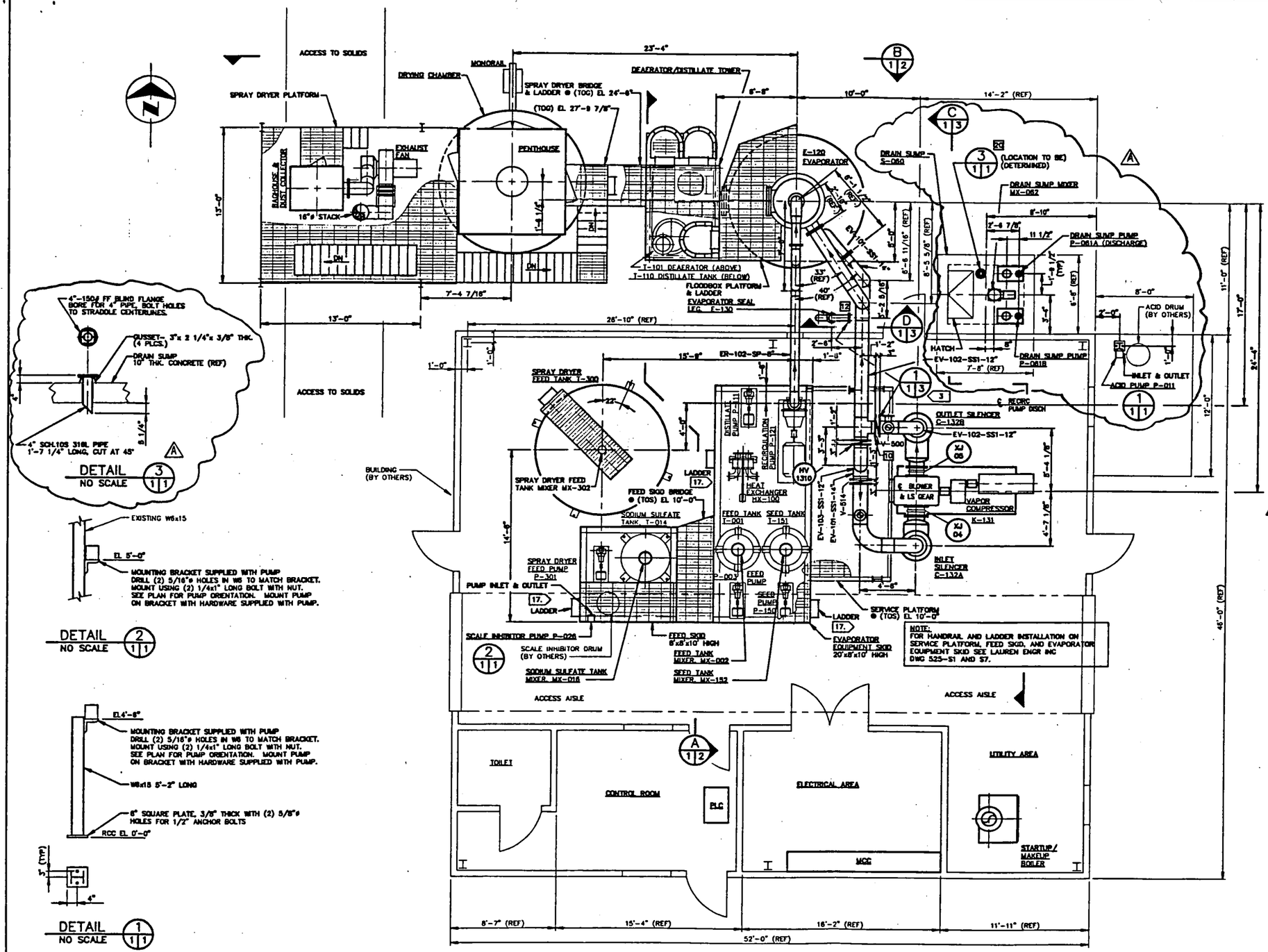
GENERAL REVISION	VTD				1	
CERTIFIED	VTD				0	

DRN	VTD
CHKD	JRG
CUSTOMER	ACE/PASCO PASCO, FLORIDA
SCALE	NONE

PROCESS FLOW DIAGRAM
SPRAY DRYER SYSTEM
PASCO COUNTY LEACHATE
MANAGEMENT SYSTEM

CONTRACT	ACTIVITY	CAT.	DRAWING NO.			REV.
020-5109	0412	1	5109-0412-001	1	1	1

00045816



PLAN VIEW

GENERAL NOTES

1. ALL ELEVATIONS ARE REFERENCED TO RCC ELEVATION 0'-0". THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN EQUIPMENT & TANK ELEVATIONS PER THE EQUIPMENT INSTALLATION SCHEDULE, SHEET 4. FIELD VERIFICATION OF ALL DIMENSIONS, INCLUDING ALL REFERENCE DIMENSIONS, SHALL BE REQUIRED PRIOR TO EQUIPMENT INSTALLATION. VERIFY ALL EQUIPMENT LOCATIONS PRIOR TO INSTALLING INTERCONNECTING PIPING.
2. EQUIPMENT LISTED IN THE EQUIPMENT INSTALLATION SCHEDULE WILL BE PROVIDED BY RCC AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION OF EQUIPMENT IN ACCORDANCE WITH THESE DRAWINGS ANY REFERENCE DRAWINGS, MANUFACTURER'S INSTRUCTIONS AND RCC SPECIFICATION 615-15050.
3. ONE END OF RCC SUPPLIED DUCT PROVIDED WITH FIELD TRIM ALLOWANCE. CONTRACTOR SHALL DETERMINE EXACT LENGTH AND TRIM AT TIME OF INSTALLATION.
4. ALL MATING FLANGES SHALL HAVE PARALLEL FACES WITH NO OFFSET BETWEEN PIPE CENTERLINES. PROVISIONS HAVE BEEN MADE ON THE PRE-FABRICATED BRINE AND VAPOR PIPING (8" THRU 14") TO PERMIT PIPING ADJUSTMENTS AND ALIGNING OF PIPING TO EQUIPMENT.
5. THE CONTRACTOR SHALL PROVIDE ALL CONCRETE EXPANSION ANCHORS. REFERENCE DRAWING 615-S1-1 SHT 1 FOR SIZE, QUANTITY AND TYPE. FOR DUCT SUPPORT ANCHOR BOLT SIZE AND QUANTITIES SEE SHT 3.
6. ALL FIELD BOLTED ASSEMBLIES SHALL HAVE AN ADEQUATE APPLICATION OF PERMATEX ANTI-SEIZE COMPOUND ON BOLT THREADS. APPLY AS RECOMMENDED BY MANUFACTURER. CARBON STEEL FASTENERS SHALL BE PROTECTED BY A RUST PREVENTATIVE.
7. ALL GROUT SHALL BE EMBECO 636 NON-SHRINK OR AN APPROVED EQUAL.
8. [1],[2], ETC. INDICATES BOLTING REQUIREMENTS. (SEE BOLT & GASKET SCHEDULE SHEET 4).
   A. HEX HEAD OR STUD BOLT A-193 GR. B7, W/HEX NUTS A-194-7 AND SPLIT RING TYPE SERIES WASHERS.
   B. GASKETS SHALL BE 1/8" THICK EPDM, ANSI 18.21, 60 DUROMETER HARDNESS.

   UNLESS OTHERWISE NOTED THE CONTRACTOR INSTALLING THE EQUIPMENT ON THIS DRAWING (615-M5-1, SHT. 1-4) SHALL BE RESPONSIBLE FOR PROVIDING ALL BOLTS, NUTS, WASHERS, GASKETS, CONCRETE EXPANSION ANCHORS, ETC. REQUIRED FOR EQUIPMENT MOUNTING, FLANGE MAKE-UP AND DUCT/PIPE SUPPORT, HANGING AND BRACING. FIELD VERIFY ALL FASTENER LENGTHS AND DIAMETERS PRIOR TO ORDERING.
9. INSTALL 267 RCC SUPPLIED DISTRIBUTORS INTO THE EVAPORATOR TOP TUBESHEET. AFTER DISTRIBUTORS ARE INSTALLED, FLOOD BOX SHALL BE CLOSED, AND FURTHER ACCESS INTO THE AREA LIMITED. PARTICULAR CARE MUST BE TAKEN TO KEEP FLOOD BOX FREE OF LOOSE MATERIAL (i.e. DIRT, DEBRIS, TOOLS, ETC.) WHICH MIGHT OBSTRUCT OPENINGS IN THE DISTRIBUTORS.
10. INSTALL 1" PACKING SADDLES (PROVIDED BY RCC) INSIDE DEAERATOR TO A HEIGHT OF 7'-6" ABOVE PACKING SUPPORT TRAY.
11. MATERIAL FOR EVAPORATOR PIPING SWAY BRACES, SPRING CANS AND PIPE SUPPORTS SHALL BE PROVIDED BY CONTRACTOR.
12. ALL FIELD WELDS SHALL BE MADE BY AWS OR ASME SECTION IX QUALIFIED AND CERTIFIED WELDERS. WELDING WIRE AND ELECTRODES SHALL BE AS FOLLOWS:
   A. ALLOY 10 ALLOY SHALL BE WELDED WITH INCONEL WELDING WIRE SUCH AS ERNiCrMo-3 PER CODE (CASE 2128).
   B. C.S. TO C.S. SHALL BE WELDED WITH E-60 OR E-70 ELECTRODE.
   C. 316L OR 317L TO C.S. SHALL BE WELDED WITH E-309 ELECTRODE (SMAW).
   D. 316L TO 316L AND 317L TO 317L SHALL BE WELDED WITH ERNiCrMo-3 OR ENiCrMo-3 (CASE 2129).
   E. 304L OR 316L TO ALLOY 10 SHALL BE WELDED WITH ERNiCrMo-3 (CASE 2126).

   A. ALL WELDS TO BE CLEANED WITH STAINLESS WIRE BRUSH. ALL WELD SPLATTER TO BE REMOVED.

   ALLOY 10 DUCTS: ER-101-SP-12, & ER-102-SP-8" 316L SS DUCTS: EV-101-SS1-14", EV-102-SS1-12" REFER TO RCC SPECIFICATION 615-15080 AND 615-15072 FOR ALL OTHER PIPING MATERIAL DESIGNATIONS (SS1, SS5, ETC.)
13. NO WELDING, GRINDING OR OTHER MECHANICAL WORK IS ALLOWED ON ANY VESSELS OR TANKS.
14. METAL EXPANSION JOINTS ARE PROVIDED WITH TEMPORARY SHIPPING BARS AND PERMANENT CONTROL RODS (WHERE NOTED BELOW). RUBBER EXPANSION JOINTS MUST HAVE THE CONTROL RODS MOUNTED BEHIND THE MATING FLANGES. THE INSTALLATION PROCEDURE USED SHALL BE AS FOLLOWS:
   A. INSTALL THE EXPANSION JOINTS IN PLACE, CHECK FACE-TO-FACE DIMENSIONS FOR OVER-EXTENSION OR OVER-COMPRESSION OF JOINT. PIPE ALIGNMENT SHALL BE HELD TO WITHIN 1/8". EXPANSION JOINT MUST NOT BE USED TO CORRECT PIPE MISALIGNMENT. SHIPPING BARS MUST REMAIN ATTACHED UNTIL ALL ASSOCIATED PIPING IS INSTALLED.
   B. INSTALL THE COMPRESSION SLEEVES AND ADJUST THE CONTROL RODS (WHERE APPLICABLE) TO THE FOLLOWING TABLE:

XJ-NO.	DESCRIPTION	FACE TO FACE	ALLOWABLE COMPRESSION	ALLOWABLE EXTENSION	NO OF CONTROL RODS	COMPRESSION SLEEVES
XJ-03	12" DIA. RUBBER	8"	7/8" MAX	1/2"MAX	4	YES
XJ-04	16" DIA. METAL	8 1/2"	1" MAX	-	4	NO
XJ-05	14" DIA. METAL	7 1/2"	5/8" MAX	-	4	NO

   C. ONLY AFTER INSTALLATION AND ADJUSTMENT OF CONTROL RODS SHALL THE SHIPPING BARS ON THE METAL JOINTS BE REMOVED. TO REMOVE THE SHIPPING BARS, PLACE A SHIELD AROUND THE METAL BELLOWS FOR PROTECTION AND GRIND OR CUT BARS.
15. INSTALL TWO (2) MIST ELIMINATORS PER OTTO H. YORK INSTALLATION INSTRUCTIONS AND DWG. AD-33157-01. ALL TIE WIRE SUPPLIED WITH MIST ELIMINATORS. REFERENCE ALASKAN COPPER DWG. M-4838, SHEET 3 FOR LOCATION OF MIST ELIMINATORS. CONTRACTOR TO PROVIDE SCAFFOLDING INSIDE SUMP FOR MIST ELIMINATOR INSTALLATION.
16. FOR INSULATION OF EQUIPMENT SEE RCC SPECIFICATION 615-15281.
17. LADDERS ON EVAPORATOR EQUIPMENT SKID (2 REQD), LADDER ON FEED SKID AND LADDER FROM GRADE TO ELEVATION 16'-0" ON DEAERATOR/DISTILLATE TOWER ARE SUPPLIED BY LAUREN ENGINEERS INC. CONTRACTOR SHALL INSTALL THESE LADDERS TO SKIDS (BOLTS SUPPLIED WITH SKIDS). CONNECT BOTTOM OF LADDER TO CONCRETE FLOOR USING 3/4" HILTI TYPE ANCHOR BOLTS (2 PER LADDER, SUPPLIED BY CONTRACTOR), AND GROUT.

LTR	REVISIONS	BY	CHK	APP	DATE
A	ADDED SUMP PUMPS/MIXER, MODIFICATION TO DUCT,	THN	Bom.	MTW	9/6/96
A	NOTE 12 & 17 REVISION, AND ADDED DETAIL 3.				

ENG RECORD		
T. NADEAU	DRAWN	
E.K. KRAVETSKY	CHECKED	
M. McCLURKIN	PROJ. ENGR	5/8/96
M. WOOLLEY	APPROVED	5/8/96

DRAWING STATUS		
ISSUED		DATE
PRELIMINARY		
FOR COMMENTS AND/OR APPROVAL		
M.E. SPANN APPROVED FOR CONSTRUCTION	0	5/10/96
REVISED FOR CONSTRUCTION	A	9/6/96

EQUIPMENT INSTALLATION PLAN VIEW

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168B

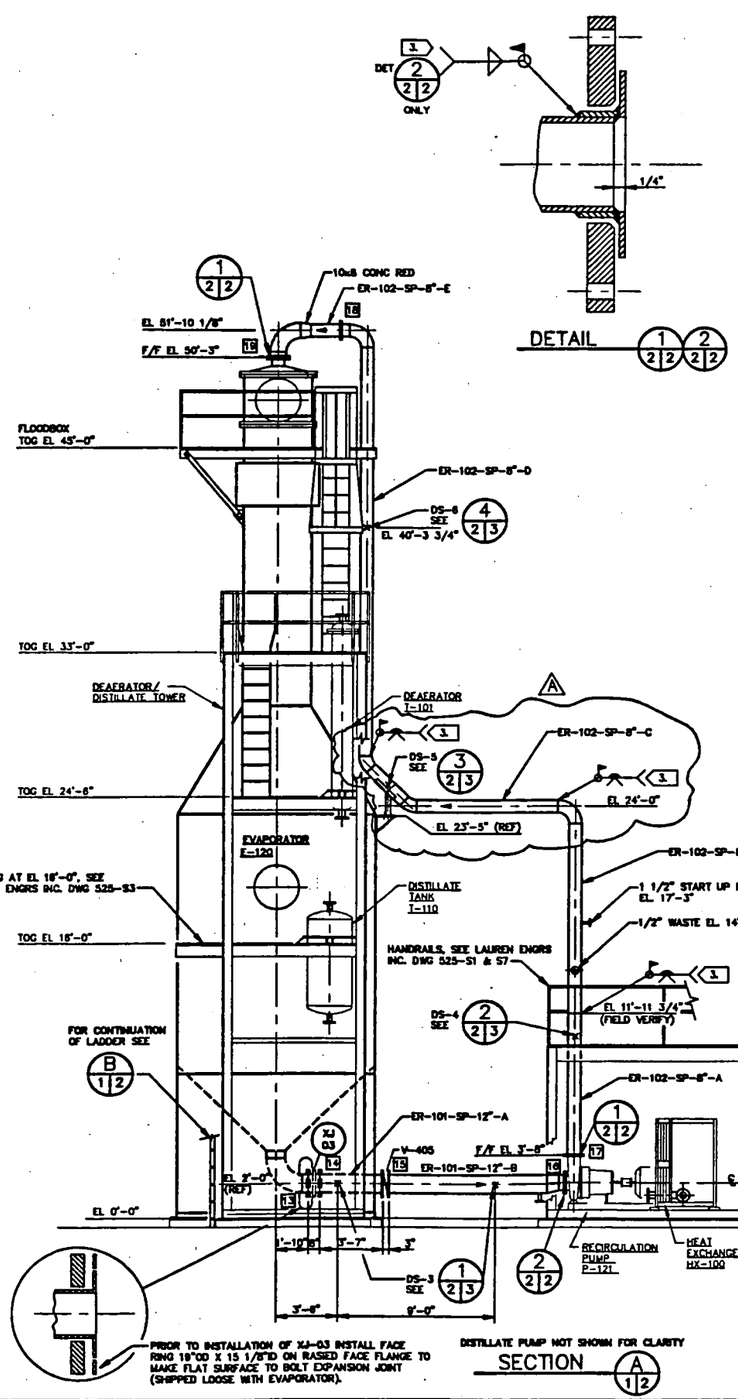
RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M5-1

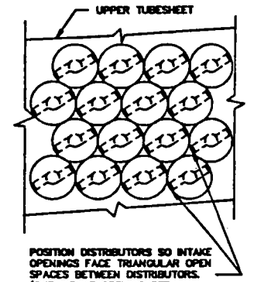
SHEET NO. 1 OF 4

SCALE 1/4"=1'-0"

REV A



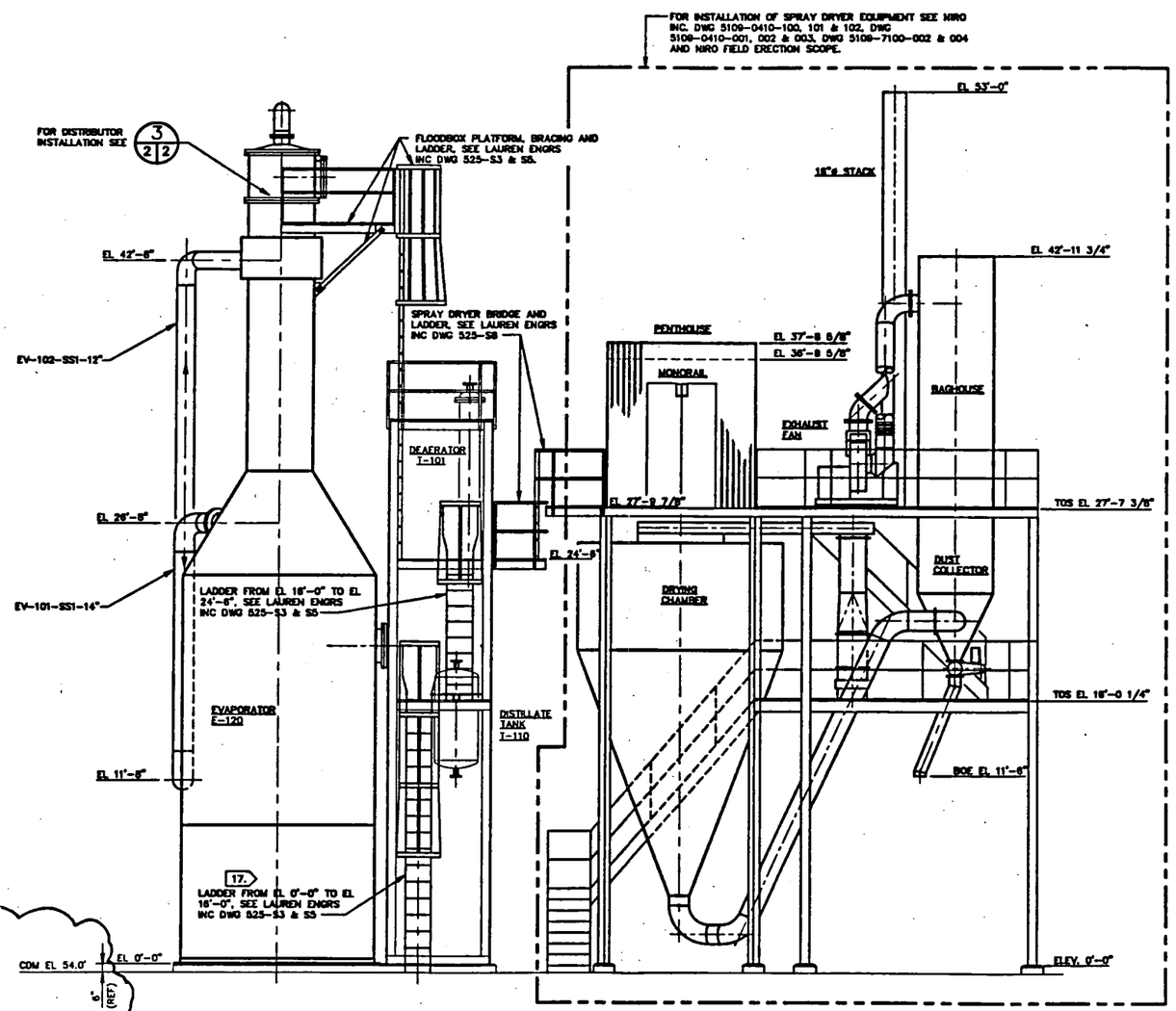
SECTION A 1|2



DISTRIBUTOR INSTALLATION DETAIL 9

DETAIL 3|2|2

DETAIL 1|2|2 2|2|2



SECTION B 1|2

LTR	REVISIONS	BY	CHK	APP	DATE
A	DUCT MODIFICATION AND ADDED REF. ELEVATION	THN	BDK	MTM	6/4/96

LTR	REVISIONS	BY	CHK	APP	DATE

ENG RECORD	
DRAWN	T. NADEAU
CHECKED	E.K. KRAVETSKY
ENGR'G APPR	M. McCLURKIN 5/8/96
APPROVED	M. WOOLLEY 5/8/96

DRAWING STATUS		
ISSUED	DATE	
PRELIMINARY		
FOR COMMENTS AND/OR APPROVAL		
M.E. SPANN APPROVED FOR CONSTRUCTION	0	5/10/96
REVISED FOR CONSTRUCTION	A	7/1/96

EQUIPMENT INSTALLATION ELEVATION

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168B

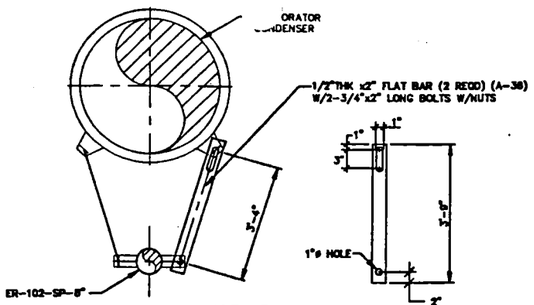
RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M5-1

SHEET NO. 2

SCALE 1/4"=1'-0"

REV. A



DS-6
DETAIL 4 2|3
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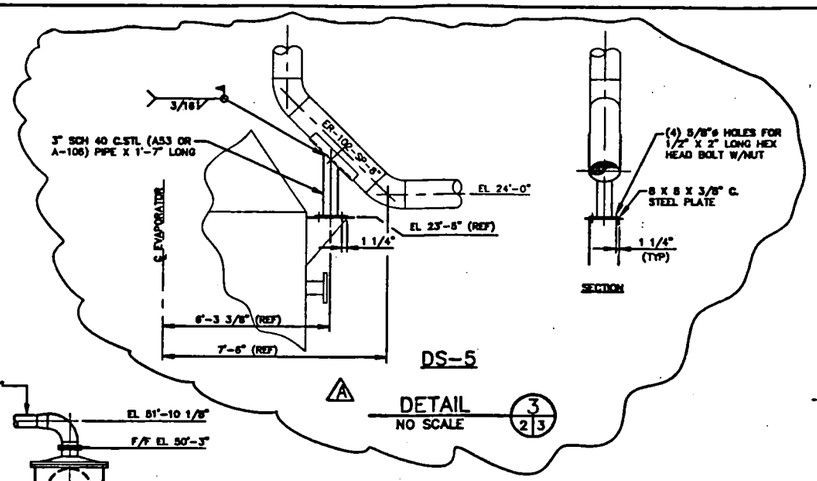
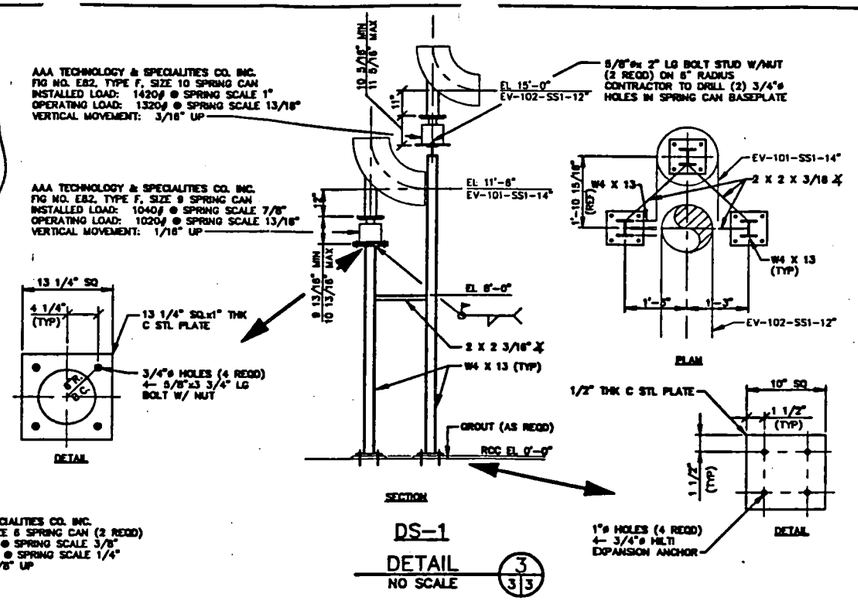


DS-5
DETAIL 3 2|3
NO SCALE



DS-1
DETAIL 3 3|3
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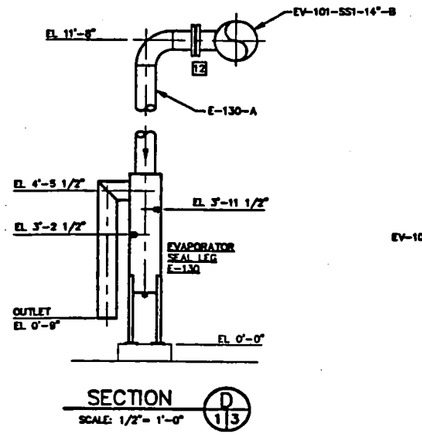
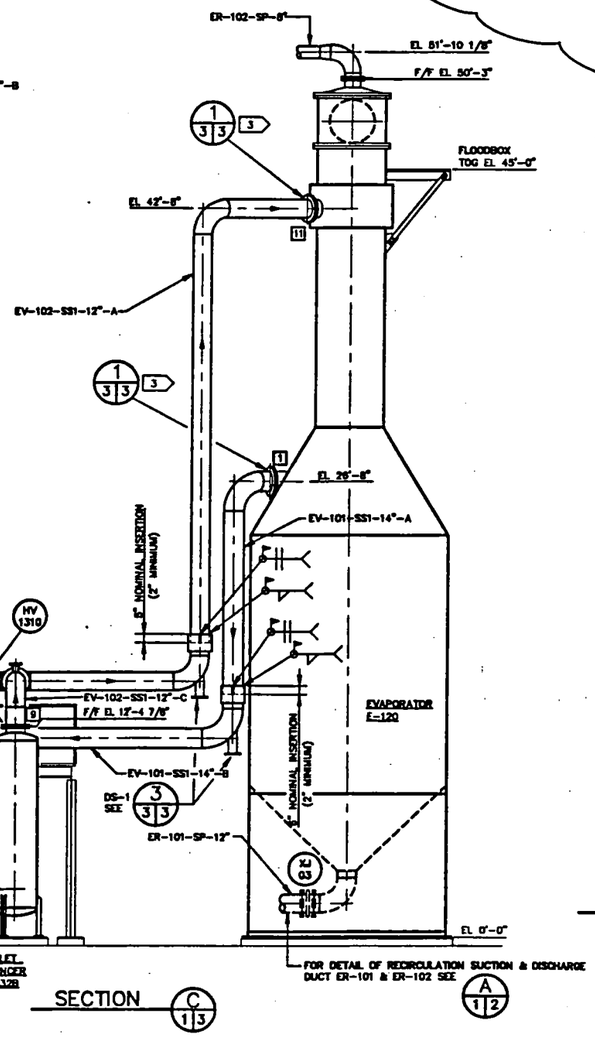
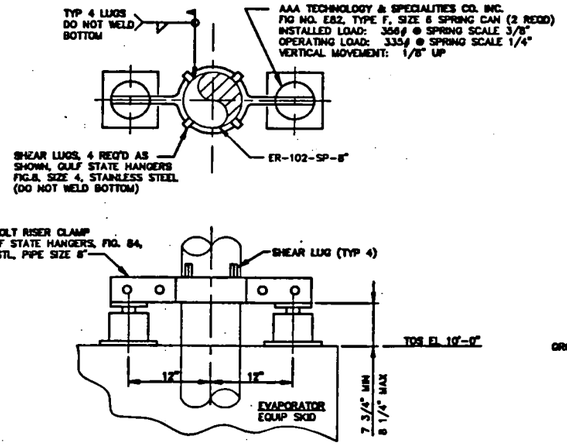


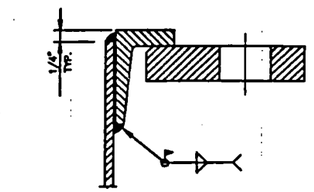
SECTION
SCALE: 1/2"= 1'-0"
D 1|3



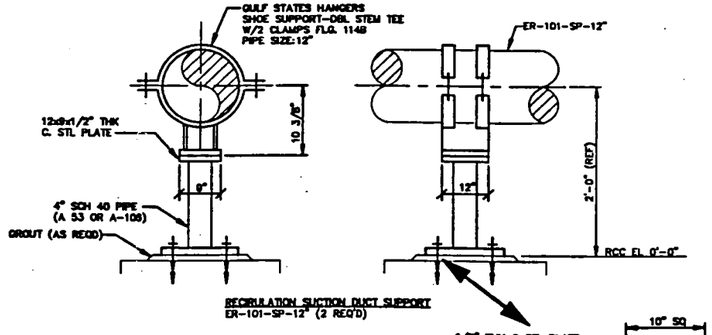
SECTION
SCALE: 1/2"= 1'-0"
C 1|3



DS-4
DETAIL 2 2|3
NO SCALE



DETAIL
NO SCALE 1|3 2|3 1|3



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DETAIL 1 2|3
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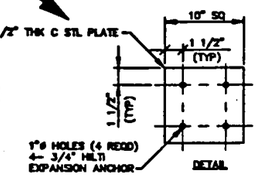

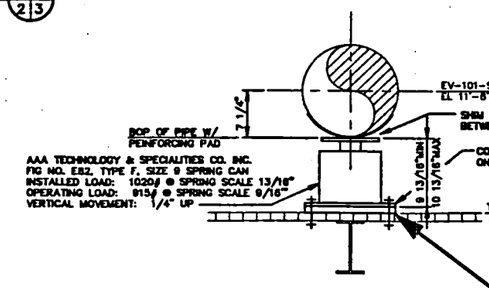

DS-2
DETAIL 4 3|3
NO SCALE

LTR	REVISIONS	BY	CHK	APP	DATE
A	DETAIL 3 REVISED	THN	BDL	MSW	5/10/96

LTR	REVISIONS	BY	CHK	APP	DATE

STAMP

ENG RECORD	
DRAWN	T. NADEAU
CHECKED	E.K. KRAVETSKY
PROJ ENGR	M. McCLURKIN 5/8/96
APPROVED	M. WOOLLEY 5/8/96

DRAWING STATUS		
	ISSUED	DATE
PRELIMINARY		
FOR COMMENTS AND/OR APPROVAL		
M.E. SPANN APPROVED FOR CONSTRUCTION	0	5/10/96
RECORD FOR CONSTRUCTION	A	7/1/96

EQUIPMENT INSTALLATION SECTIONS & DETAILS

PASCO COUNTY LEACHATE MANAGEMENT SYSTEM

CUSTOMER ORDER NO. 94-2168B

RESOURCES CONSERVATION COMPANY

DRAWING NO. 615-M5-1

SHEET NO. 3

SCALE 1/4"=1'-0"

REV. A

8 7 6 5 4 3 2 1

D C B A

EQUIPMENT INSTALLATION SCHEDULE

DESCRIPTION	TAG NO.	REFERENCE DRAWING	INSTALLATION ORIENTATION	BASEPLATE ELEVATION	NOMINAL GROUT ALLOWANCE	WEIGHT LBS.	REMARKS	BOLTING REQUIREMENTS QTY	BOLTING REQUIREMENTS SIZE
EVAPORATOR	E-120	ALASKAN COPPER WORKS M-4938	12" RECIRC. OUTLET @ 180°	0'-0"	1"	25,272		16	1 1/4" HEX NUT & WASHER
EVAPORATOR EQUIPMENT SKID	-	LAUREN ENGINEERS, INC. 525-S2	RECIRC. PUMP SUCTION @ 0°	0'-0"	1"	18,000		12	3/4" HEAVY HEX NUT & WASHER
FEED SKID	-	LAUREN ENGINEERS, INC. 525-S1	SPRAY DRYER FEED PUMP SUCTION @ 0°	0'-0"	1"	7,000		8	3/4" HEAVY HEX NUT & WASHER
DEACRATOR/DISTILLATE TOWER	-	LAUREN ENGINEERS, INC. 525-S3	4" DISTILLATE INLET @ 180°	0'-0"	1"	11,000		8	3/4" HEAVY HEX NUT & WASHER
VAPOR COMPRESSOR	K-131	ROOTS DRESSER 879-877-013	16" VAPOR INLET @ 180°	0'-0"	2"	11,250	SEE MANUFACTURERES INSTALLATION INSTRUCTIONS & RCC SPEC. 615-15050		
INLET SILENCER	C-132A	STODDARD SILENCER INC 82A954	16" OUTLET FLANGE @ 0°	0'-0"	2"	2,500		3	3/4" HEAVY HEX NUT & WASHER
OUTLET SILENCER	C-1329	STODDARD SILENCER INC 74-8818	14" INLET FLANGE @ 180°	0'-0"	2"	3,000		3	3/4" HEAVY HEX NUT & WASHER
RECIRCULATION SUCTION DUCT	ER-101-SP-12"	ALASKAN COPPER M-4984	SEE SHEET 1,2 & 3	-	-	650			SEE BOLT SCHEDULE THIS SHEET
RECIRCULATION DISCHARGE DUCT	ER-102-SP-8"	ALASKAN COPPER M-4984	SEE SHEET 1,2 & 3	-	-	1,700			SEE BOLT SCHEDULE THIS SHEET
VAPOR SUCTION DUCT	EV-101-SS1-14"	ALASKAN COPPER M-4983	SEE SHEET 1,2 & 3	-	-	1,900			SEE BOLT SCHEDULE THIS SHEET
VAPOR DISCHARGE DUCT	EV-102-SS1-12"	ALASKAN COPPER M-4985	SEE SHEET 1,2 & 3	-	-	1,800			SEE BOLT SCHEDULE THIS SHEET
SPRAY DRYER FEED TANK, ACCESS PLATFORM AND LADDER	T-300	PALMER OF TEXAS AP15760	2" FEED OUTLET @ 180°	0'-0"	-	3,000	FOR ANCHOR HOLDDOWN PLATE SEE PALMER OF TEXAS AP15760 SHT 4	4	3/4" HEAVY HEX NUT & WASHER
SPRAY DRYER FEED TANK MIXER	MX-302	THE BURHANS-SHARPE CO A4780	SEE SHEET 1	-	-	410	INSTALL IMPELLER AFTER SHAFT IS INSTALLED THROUGH TANK OPENING	4	3/8x2" LG. HEX HEAD BOLT WITH 3/8" REGULAR HEX NUT
SODIUM SULFATE TANK MIXER	MX-016	LAUREN ENGINEERS, INC. 525-S3 & S8	SEE SHEET 1	-	-	90	INSTALL IMPELLER AFTER SHAFT IS INSTALLED THROUGH TANK OPENING	4	7/16x2" LG. HEX HEAD BOLT WITH 7/16" REGULAR HEX NUT
FEED TANK MIXER	MX-002	THE BURHANS - SHARPE CO. A6008	SEE REMARKS	0'-0"	1"	90	INSTALL IMPELLER AFTER SHAFT IS INSTALLED THROUGH TANK OPENING	4	7/16x2" LG. HEX HEAD BOLT WITH 7/16" REGULAR HEX NUT
SEED TANK MIXER	MX-152	THE BURHANS - SHARPE CO. A6008-1	SEE REMARKS	-	-	100	INSTALL IMPELLER AFTER SHAFT IS INSTALLED THROUGH TANK OPENING	8	3/4"x3 1/4" LG. HEX HEAD BOLT WITH 3/4" REGULAR HEX NUT
STARTUP BOILER	B-101	BRYAN BOILERS C11814	SEE SHEET 1	0'-0"	1"	2000			
EVAPORATOR SEAL LEG	E-130	ALASKAN COPPER WORKS M-4985	SEE REMARKS	0'-0"	1"	300			
RUST INHIBITOR DISPENSER	T-135	OIL-RITE CORPORATION CATALOG # B-1256-1	SEE REMARKS	-	-	-			
FEED SKID BRIDGE	-	LAUREN ENGINEERS, INC. 525-S1 & S7	SEE SHEET 1	-	-	-			
SERVICE PLATFORM	-	LAUREN ENGINEERS, INC. 525-S1 & S7	SEE SHEET 1	-	-	-			
EVAPORATOR FLOOR BOX PLATFORM & LADDER	-	LAUREN ENGINEERS, INC. 525-S3 & S8	SEE SHEET 1	-	-	-			
SPRAY DRYER BRIDGE AND LADDER	-	LAUREN ENGINEERS, INC. 525-S3 & S8	SEE SHEET 1	-	-	-			
SPRAY DRYER	-	NIRO INC. 5100-0410-001, 002, 003, 100, 101 & 102	SEE REMARKS	0'-0"	1"	-	SPRAY DRYER & LOOSE COMPONENTS TO BE ASSEMBLED USING FIELD ERECTION SCOPE & REFERENCE DRAWINGS LISTED AT LEFT		
SPRAY DRYER STRUCTURAL	-	NIRO INC. 5100-7100-002 & 004	SEE REMARKS	-	-	-			
DRAIN SUMP PUMPS	P-081A/B	FYBROC 040127	2" DISCHARGE ON EAST SIDE	-	-	240 EA.		4 EA.	5/8" x 1 5/8" LG. WELDSTUD WITH 5/8" REGULAR HEX NUT/WASHER
DRAIN SUMP MIXER	MX-082	THE BURHANS-SHARPE CO. A5021	SEE REMARKS	-	-	120	INSTALL IMPELLER AFTER SHAFT IS INSTALLED THROUGH SUMP OPENING	4	3/8" x 1 1/4" LG. WELDSTUD WITH 3/8" REGULAR HEX NUT/WASHER

8 BOLT AND GASKET SCHEDULE FOR PIPING (BY OTHERS)

SYMBOL	GASKET (PER JOINT) QTY.	GASKET (PER JOINT) TYPE	GASKET (PER JOINT) SIZE	MAT'L SEE NOTE 8	BOLT (PER JOINT) QTY.	BOLT (PER JOINT) SIZE IN INCHES	HEX NUT (PER JOINT) QTY.	HEX NUT (PER JOINT) SIZE IN INCHES	WASHER (PER JOINT) QTY.	WASHER (PER JOINT) SIZE IN INCHES	REMARKS
□											
1	1	RING	14" ID X 17 3/4" OD		12	1"xSUNCx3 3/4" LONG	12	1"xSUNC	12	1"	EVAPORATOR E-120 OUTLET TO VAPOR SUCTION DUCT EV-101-SS1-14"
2	-	-	-	-	12	1"xSUNCx8" LONG	24	1"xSUNC	24	1"	VAPOR SUCTION DUCT EV-101-SS1-14" TO V-814
3	1	FULL FACE	14" ID X 21" OD		12	1"xSUNCx3 1/2" LONG	12	1"xSUNC	12	1"	VAPOR SUCTION DUCT EV-101-SS1-14" INLET SILENCER C-132A
4	2	RING	12 3/4" ID X 18 1/8" OD		12	1"xSUNCx8 1/2" LONG STUD	24	1"xSUNC	24	1"	VAPOR SUCTION EV-101-SS1-12" BYPASS TO HV-1310
5	1	FULL FACE	16" ID X 23 1/2" OD		8 8	1"xSUNCx3 1/4" LG 1"xSUNCx4" LG	16	1"xSUNC	16	1"	INLET SILENCER C-132A OUTLET TO EXPANSION JOINT XJ-04
6		-				SEE REMARKS					XJ-04 TO INLET ON COMPRESSOR K-130 BOLTING SUPPLIED WITH COMPRESSOR
7		-				SEE REMARKS					COMPRESSOR K-130 OUTLET TO XJ-05 BOLTING SUPPLIED WITH COMPRESSOR
8	1	FULL FACE	14" ID X 21" OD		4 8	1"xSUNCx3 1/4" LG 1"xSUNCx4" LG	12	1"xSUNC	12	1"	XJ-05 TO INLET ON OUTLET SILENCER C-1329
9	1	FULL FACE	12 3/4" ID X 18" OD		12	1"xSUNCx3 1/2" LONG	12	1"xSUNC	12	1"	OUTLET SILENCER OUTLET TO VAPOR DISCHARGE DUCT EV-102-SS1-12"
10	-	-	-	-	12	1"xSUNCx8" LONG STUD	24	1"xSUNC	24	1"	VAPOR DISCHARGE DUCT EV-102-SS1-12 TO V-500
11	1	RING	12 3/4" ID X 18 1/8" OD		12	1"xSUNCx3 3/4" LONG	12	1"xSUNC	12	1"	VAPOR DISCHARGE DUCT EV-102-SS1-12" TO EVAPORATOR E-120 INLET
12	1	RING	8 5/8" ID X 6 3/4" OD		8	3/4"x10UNCx3" LONG	8	3/4"x10UNC	8	3/4"	VAPOR DISCHARGE DUCT EV-102-SS1-12" TO EVAPORATOR SEAL LEG E-130
13	-	-	-	-	4 8	7/8"xSUNCx3 3/4" LG 7/8"xSUNCx4 3/4" LG	12	7/8"xSUNC	12	7/8"	EVAPORATOR E-120 RECIRC. OUTLET TO XJ-03
14	-	-	-	-	4 8	7/8"xSUNCx3 3/4" LG 7/8"xSUNCx4 3/4" LG	12	7/8"xSUNC	12	7/8"	XJ-03 TO EVAPORATOR SUCTION DUCT ER-101- SP-12"
15	-	-	-	-	12	7/8"xSUNCx8 1/2" LONG STUD	24	7/8"xSUNC	24	7/8"	EVAPORATOR SUCTION DUCT ER-101-SP-12" TO V-405
16	1	FULL FACE	10 3/4" ID X 16" OD		12	7/8"xSUNCx4" LONG	12	7/8"xSUNC	12	7/8"	EVAPORATOR SUCTION DUCT ER-101-SP-12" TO RECIRC PUMP P-121 SUCTION
17	1	FULL FACE	8 5/8" ID X 13 1/2" OD		8	3/4"x10UNCx3 3/4" LONG	8	3/4"x10UNC	8	3/4"	RECIRC PUMP P-121 DISCH TO ER-102-SP-8"
18	1	RING	8 5/8" ID X 11" OD		8	3/4"x10UNCx4" LONG	8	3/4"x10UNC	8	3/4"	EVAPORATOR RECIRC DISCHARGE DUCT ER-102-SP-8" AT BREAK FLANGES
19	1	RING	10 3/4" ID X 13 3/8" OD		12	7/8"xSUNCx3 3/4" LONG	12	7/8"xSUNC	12	7/8"	EVAPORATOR RECIRC DISCHARGE DUCT ER-102-SP-10" TO EVAPORATOR E-120 INLET
20	1	FULL FACE	6 1/2" ID X 9" OD		8	5/8"x11UNCx3" LONG	8	5/8"x11UNC	16	5/8"	DRAIN SUMP LEVEL TRANSMITTER LT-0830

NOTES:

1. FOR GENERAL NOTES SEE SHT 1.

LTR	REVISIONS	BY	CHK	APP	DATE
A	ADDED SUMP PUMPS, MIXER, AND ITEM 20.	THN	B.D.K.	[illegible]	9/6/96

PROPRIETARY

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ENG RECORD		
DRAWN	T. NADEAU	
CHECKED	E.K. KRAVETSKY	
PROJ ENGR	M. McCLURKIN	3/8/96
APPROVED	M. WOOLLEY	8/8/96

DRAWING STATUS		
ISSUED		DATE
PRELIMINARY		
FOR COMMENTS AND/OR APPROVAL		
M.E. SPANN APPROVED FOR CONSTRUCTION	0	5/10/96
REVISED FOR CONSTRUCTION	A	9/6/96

EQUIPMENT INSTALLATION SCHEDULES	DRAWING NO. 615-M5-1
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM	SHEET NO. 4
CUSTOMER ORDER NO. 94-2168B	SCALE NONE REV A
RESOURCES CONSERVATION COMPANY	

PLOT: 1=1

PASCO COUNTY, FLORIDA

May 18, 1995

Mr. Joe Bostjancic
Resources Conservation Company
3006 Northup Way
Bellevue, WA 98004-1407

RE: Agreement Between Resources Conservation Company and Pasco County for Provision and Installation of Leachate Treatment Equipment

Dear Mr. Bostjancic:

At the May 16, 1995 meeting of the Pasco County Board of County Commissioners, the above-mentioned agenda item was approved. Attached is an original agreement for your file.

If you have any questions, please contact the Secretarial Services Department at 38053 Live Oak Avenue, Dade City, FL 33525-3819 or call (904) 521-4156.

Sincerely,

JED PITTMAN
CLERK TO THE BOARD

By: Debbie Olszanski
Deputy Clerk

JP/do

Enclosure

ORIGINAL

AGREEMENT BETWEEN RESOURCES CONSERVATION COMPANY AND PASCO COUNTY FOR PROVISION AND INSTALLATION OF LEACHATE TREATMENT EQUIPMENT

THIS CONTRACT AGREEMENT, entered into this ____ day of _____, 1995, by and between RESOURCES CONSERVATION COMPANY, (RCC) a Division of Ionics, Incorporated, a Massachusetts corporation with its RCC Division principal offices in Bellevue, Washington, hereinafter called the "SELLER" and PASCO COUNTY, FLORIDA, a political subdivision of the State of Florida, hereinafter called the OWNER.

WITNESSETH:

WHEREAS, a Technical Memorandum titled "Leachate Management System at West Pasco Landfill" was prepared on the OWNER'S behalf and recommended that the OWNER treat leachate from the ashfill using a physical, evaporative process; and

WHEREAS, the OWNER undertook a Request for Qualification and Experience ("RFQ") process to solicit and consider qualifications and technologies from companies interested in providing equipment and services in connection with treating leachate employing physical, evaporative processes and the SELLER submitted a Statement of Qualifications in response to the RFQ; and

WHEREAS, interviews were held with several companies and RESOURCES CONSERVATION COMPANY, a Division of Ionics was recommended by the selection committee in reliance upon the SELLER's experience and expertise in treating leachate as represented in the SELLER's Statement of Qualifications and during said interview; and

WHEREAS, on December 6, 1994, the Pasco County Board of County Commissioners authorized County Staff to begin negotiations with the SELLER for the procurement of leachate treatment equipment; and

WHEREAS, upon completion of start-up, the leachate treatment facility will eliminate the need to treat leachate at the Shady Hills WWTP and will result in the production of a high quality distilled water and a dry calcium salt; and

WHEREAS, the OWNER and the SELLER mutually agree that the SELLER will provide equipment, design, installation and start-up services, and license agreement for the West Pasco Ashfill Leachate Treatment Facility using the SELLER's Propriety Vapor Compression Evaporation process.

NOW, THEREFORE, in consideration of the mutual promises and covenants herein contained, it is agreed as follows:

ARTICLE I - TERMS OF AGREEMENT

This Agreement shall commence on the date of execution. Both parties mutually agree to the terms, conditions and schedules hereinafter specified in the Contract Documents by the laws, rules, and regulations of the State of Florida, and any resolutions needed to resolve conflicts shall be settled in Pasco County, Florida.

ARTICLE II - THE WORK

That the SELLER shall furnish, at the Pasco County Resource Recovery Plant site, Hudson, Florida, and install the leachate treatment system, and ancillary technical services, complete in accordance with the Contract Documents, as identified herein and attached hereto and made a part hereof, and the SELLER shall execute and complete all of the Work included in the Contract Documents.

ARTICLE III - PAYMENT

The OWNER shall pay to the SELLER for the work embraced in this Contract Agreement, and the SELLER will accept as full compensation therefor payment in the following manner:

2.1 FIRM FIXED PRICE SUPPLY

For the FIXED PRICE of, $1,274,000.00 design, management, check-out, start-up, technical training services (limited to the number of hours set forth below) and supply to the above referenced site the PROPRIETARY EQUIPMENT listed below. The above FIXED PRICE also includes a TECHNOLOGY FEE, the payment of which allows the OWNER unrestricted use of the PROPRIETARY EQUIPMENT. The following is included in the FIXED PRICE:

- LABOR
  - Engineering Design
  - Installation Design
  - Project Management
  - Project Engineering
  - Purchasing
  - Check out, start-up and training at 160 hours
  - Travel and Expenses

- PROPRIETARY EQUIPMENT
  - Evaporator Concentrator using calcium sulfate seed slurry technique also including:
    - Condenser
    - Tubes
    - Tubesheets
    - Sump
    - Brine Strainer
    - Mist Eliminator
    - Distributors
    - Deaerator
    - Packing
    - Freight

- TECHNOLOGY FEE

2.2 COST REIMBURSABLE SUPPLY

All equipment (excluding the proprietary equipment listed in Section 2.1,above) freight, installation, and the performance bond will be supplied on a cost reimbursable basis. These items are listed below:

Vapor Ducts w/Expansion Joints (1 set)
Recirculation Ducts w/Expansion Joints (1 set)
Heat Exchanger
Vapor Compressor
Recirculation Pump & Motor
Feed Pump & Motor
Feed Tank
Feed Tank Mixer & Motor
Distillate Pump & Motor
Distillate Tank
Seed Pump & Motor
Seed Tank
Seed Tank Mixer & Motor
Spray Dryer Feed Tank
Spray Dryer Feed Tank Mixer & Motor
Acid Pump & Motor (2)
Scale Inhibitor Pump & Motor (2)
Scale Inhibitor Tank
Sodium Sulfate Pump & Motor (2)
Sodium Sulfate Tank
Sodium Sulfate Tank Mixer & Motor
Startup/Makeup Boiler
Spray Dryer Feed Pump & Motor
Spray Dryer Equipment
Equipment Skids
Field Instrumentation & Controls
PLC Control System
- Control Cabinet
- CRT Operator Interface CPU
- Control View

Motor Control Center
Freight on Cost-Reimbursable Equipment
Installation/Construction
Performance & Payment Bond

For all Work included in the Contract Documents, payment shall be made in the manner provided in the Contract Documents attached hereto.

ARTICLE IV - THE CONTRACT DOCUMENTS

The Contract Documents referred to in Article I are:

(1) this Contract Agreement (Document No. 1);
(2) the Special Conditions (Document No. 2);
(3) the General Conditions (Document No. 3);
(4) OWNER's site and facility design drawings and specifications (Document No. 4);
(5) SELLER's Conformed Proposal (Document No.5); and
(6) Any mutually agreed upon and duly executed change orders and/or supplemental agreements.

ARTICLE V - NONASSIGNMENT

The SELLER shall not assign, transfer, convey, or otherwise hypothecate any interest, right, duties, or obligations hereunder, or any part thereof, without the prior written consent of the OWNER.

WHEREFORE, THIS agreement has been executed on behalf of the OWNER and SELLER as of the Agreement Date.

(SEAL)

BOARD OF COUNTY COMMISSIONERS
OF PASCO COUNTY, FLORIDA

ATTEST:

BY: _____
JED PITTMAN, CLERK

BY: _____
SYLVIA YOUNG, CHAIRMAN

(SEAL)

RESOURCES CONSERVATION COMPANY
A Division of Ionics, Inc.

ATTEST:

BY: _____

BY: _____
VICE PRESIDENT

APPROVED AS TO LEGAL FORM AND CONTENT
Office of the County Attorney

By: _____
Attorney