

# **PASCO County, Florida**

## **Leachate Treatment Facility**

**May 1997**

**D.E.P.**

**MAY -6 1997**

**SOUTHWEST DISTRICT  
TAMPA**

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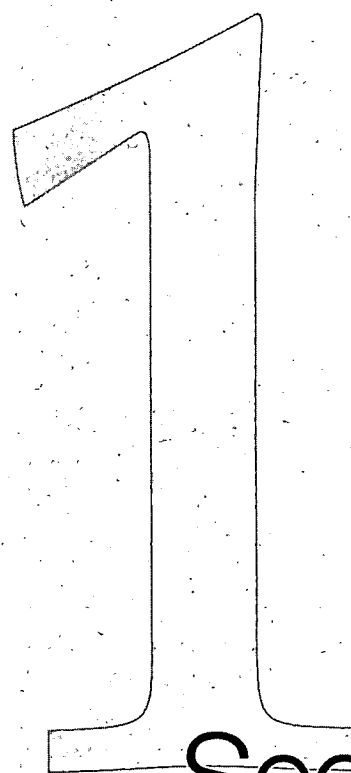
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# Contents

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# Section One

# Section 1

## Introduction

On May 17, 1996, the Florida Department of Environmental Protection (FDEP) issued an approval for the construction of a solid waste leachate storage tank and treatment facility including drawings, technical specifications, and comprehensive quality assurance plans for the West Pasco landfill. These documents were prepared by Camp Dresser & McKee Inc. (CDM) and Resources Conservation Company (RCC). RCC was retained by Pasco County to construct a leachate treatment facility. CDM was retained to provide general civil, electrical, plumbing and mechanical design for the structure.

CDM additionally provided the following services during construction activities:

1. Observation of the treatment building subgrade preparation and concrete foundations.
2. Observation of the treatment building erection.
3. Observation of the leachate transfer pump station, sanitary lift station, potable water well, distillate transfer pump and tank and duplex air compressor installation and testing.

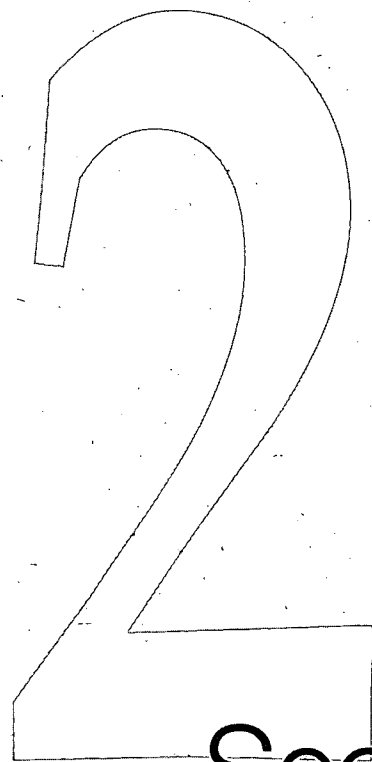
RCC provided the following services during construction activities:

1. Observation of the interior and exterior process equipment installation and testing.

CDM subcontracted with Professional Services Inc. (PSI) to provide the following services:

1. Density and thickness testing of the limerock and asphalt for the access roadway.
2. Density testing of the process building and exterior equipment foundation subgrade during placement.
3. Compressive strength test of the concrete foundations for the process building and equipment pads.

This report documents the quality assurance /quality control observations performed by CDM and RCC during construction of the leachate treatment facility.



# Section Two

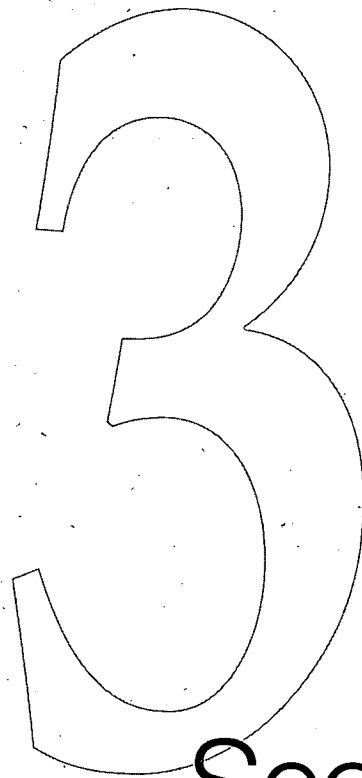
## Section 2

### Parties and Roles

The parties involved in the permitting, construction, and construction observation services, and their respective roles are described below:

Party	Role
1. Florida Department of Environmental Protection (FDEP) Tampa Office (813) 744-6100 Represented by Kim Ford, P.E.	Permitting agency
2. Pasco County, Florida - Project Owner Represented by Mr. Vincent Mannella, P.E. (813) 757-9283	Provided overall direction to all parties
3. Camp Dresser & McKee Inc. (CDM) Represented by Mr. Darwish El-Hajji, P.E. (813) 281-2900 Onsite Representative - Craig Osmanski, P.E.	Provided design and construction observation
4. Resources Conservation Company 3006 Northup Way Bellevue, WA 98004-1407 (206) 828-2400 Represented by Mike Spann	Provided design and construction observation
5. Wharton-Smith, Inc. 5600 Mariner Street, Suite 200 Tampa, Florida 33609-3417 (813) 288-0068 Project Manager - Betty Evans Superintendent - Bernie Klemann	Contracted to Pasco County to construct the storage tank and treatment facility
6. PSI 16550 Scheer Boulevard, Unit 1 Hudson, Florida 34667 (813) 868-9526 Represented by Mr. John Sansone	Retained by CDM to provide soil, concrete, limerock and asphalt testing services

Party	Role
7. Eclipse Construction, Inc. P.O. Box 5805 Lakeland, Florida 33807 Project Manager - David Eldridge Superintendent - Dale Ravencraft	Contracted to RCC to construct the treatment facility process equipment.

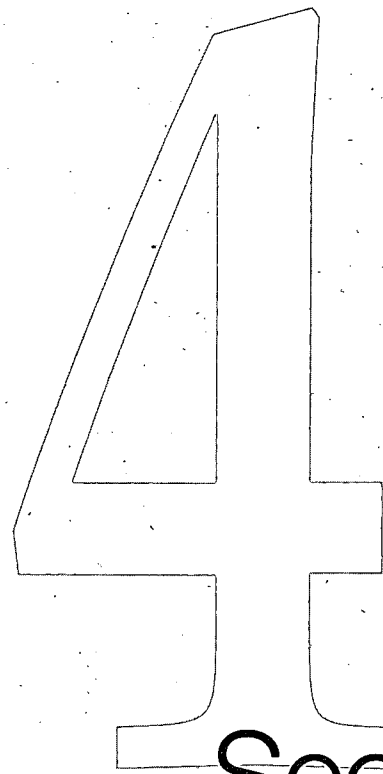


# Section Three

## Section 3

# Shop Drawing Review and Approval

CDM conducted shop drawing review and approval of the leachate treatment process building, leachate transfer pump, distillate storage tank and pump, potable water well, sanitary lift station, duplex air compressor and the associated plumbing, HVAC and electrical.



# Section Four

## Section 4

# Observation and Testing

CDM's and RCC's role was to observe the construction of the leachate treatment facility for conformance with:

- FDEP approved plans,
- Contract documents,
- Good engineering practices, and
- Industry standards.

CDM provided a qualified representative on a part-time basis during the installation and testing of the leachate treatment facility process building and equipment previously mentioned. PSI provided a representative for soil density tests, concrete foundation compressive strength tests, limerock and asphalt testing. The representative performed testing and reported to CDM during the installation of the process building and equipment pad subgrade and foundations.

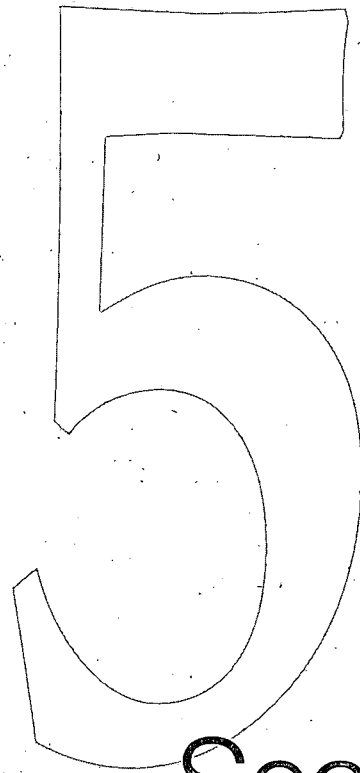
RCC provided a qualified representative on a full-time basis during the leachate process equipment installation and testing.

### 4.1 Observation of Subgrade Preparation

CDM's observation of the subgrade included visual observation of the process building and equipment foundations which were prepared by Wharton-Smith, Inc. The purpose of the visual observation was to determine if the condition of the subgrade was generally acceptable for concrete placement. The density test, concrete compressive strength tests and limerock and asphalt test results are included in Appendix C. The tests indicated that the specified minimum requirements were achieved.

### 4.2 Process Piping Hydrostatic Testing

RCC and/or their vendors/subcontractors performed hydrostatic tests of the process piping, vessels and tanks.



# Section Five

## Section 5

### Conclusion and Disclaimer

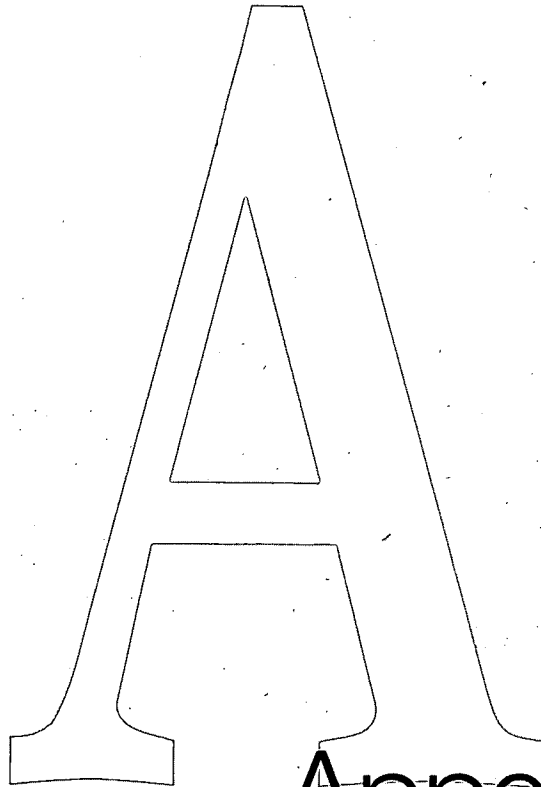
On behalf of Pasco County, Camp Dresser & McKee Inc. (CDM) provided periodic construction observation services during the county's construction of the leachate treatment process building, leachate transfer pump, distillate storage tank and pump, portable water well, sanitary lift station, duplex air compressor and the associated electrical, plumbing, and HVAC work located on the Pasco County Landfill Leachate Management project (hereinafter "the Project"). This "certification" is to advise that to the best of CDM's knowledge and belief, and based on our professional opinion, the construction of the Project has been completed in accordance with the intent of the following:

- FDEP approved plans,
- The contract documents,
- Good engineering practice, and
- Industry standards of practice.

CDM wishes to clarify, however, that our certification opinion is based, in part, on information provided by Pasco County and others and on less than full-time observation services. The attachments included in the appendices of this document were obtained from various subcontractors and vendors that performed work directly on the Project. At no time was the contractor or any of the subcontractors providing work under the direction, supervision, or control of CDM.

CDM cannot attest to the accuracy, completeness, or authenticity of the information contained in the appendices. CDM's review of the information, however, does indicate that the information provided by the contractor and its subcontractors appears to generally conform to the contract specifications.

The word "certification" as used in this statement is understood to be the professional opinion of CDM, which is based on CDM's knowledge, information, and belief, formulated in accordance with commonly accepted procedures consistent with applicable standards of practice, and as such does not constitute a guaranty or warranty, either expressed or implied.



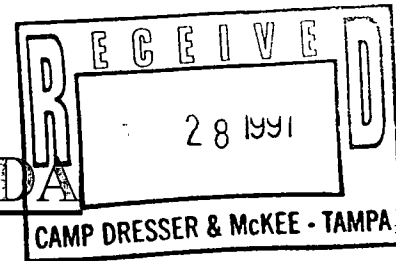
# Appendix A

## Appendix A

# FDEP Certification of Construction Completion



# PASCO COUNTY, FLORIDA



DADE CITY (352) 521-4274  
LAND O' LAKES (813) 996-7341  
NEW PORT RICHEY (813) 847-8145  
FAX (813) 847-8064

UTILITIES OPERATIONS AND  
MAINTENANCE DEPARTMENT  
PUB. WKS./UTILITIES BLDG., S-205  
7530 LITTLE ROAD  
NEW PORT RICHEY, FL 34654

April 9, 1997

Mr. Dan Strobridge  
Camp Dresser & McKee Inc.  
Westshore Center  
1715 North Westshore Blvd., S-875  
Tampa, FL 33607

RE: Leachate Management System (LMS) Pressure Testing

Dear Mr. Strobridge:

Pursuant to your request, the following statement is submitted for your use in securing the Florida Department of Environmental Protection certification:

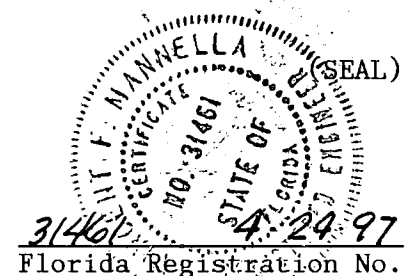
Throughout the hydro testing in the LMS pipe, pumps, tanks, and ancillary items in the plant, all inspection was witnessed by Vincent Mannella, P.E., Solid Waste Facility Manager; Ronald J. Walker, Solid Waste Superintendent; or the LMS plant operators.

The pressure test was run at 18 psig for one hour. The first test was not completed due to several leaks, etc. A second test was rerun after all leaks were repaired. Again, pressure was at 18 psig for a period of one hour. No leaks were observed in lines, pumps, or other ancillary pieces of equipment. We herewith certify that the equipment, piping, and other hydro-tested equipment held pressure of 18 psig for a time period of one hour.

In my professional opinion, the plant piping and equipment meets acceptable standards generally acceptable in the industry.

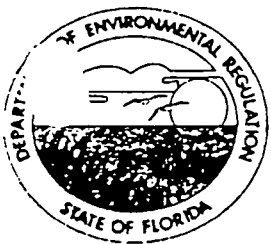
Sincerely,

Vincent Mannella, P.E.  
Solid Waste Facility Manager



VM/s040906:ltr

cc: Douglas S. Bramlett, Assistant County Administrator (Utilities Services)  
Ronald J. Walker, Solid Waste Superintendent



# Florida Department of Environmental Regulation

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

DER Form # 17-701-900121
Form Title Construction of Construction Completion of a Solid Waste Management Facility
Effective Date January 8, 1997
DER Application No.
(Filed in by DER)

## Certification of Construction Completion of a Solid Waste Management Facility

DER Construction Permit No: SC51-277316 County: Pasco County  
Name of Project: Leachate Storage Tank and Treatment Facility  
Name of Owner: Pasco County  
Name of Engineer: Darwish El-Hajji/Camp Dresser & McKee Inc.  
Type of Project: Leachate Treatment and Storage

Cost: Estimate \$ 4.2 million Actual \$ \_\_\_\_\_  
Design: Quantity: Leachate Feed Rate=35,000 gpd Site Acreage: 4.6 Acres  
Deviations from Plans and Application Approved by DER: Minor deviations are shown on the record drawings.

Address and Telephone No. of Site: 14230 Hays Road  
Spring Hill, FL 34610 (813) 861-3004  
Name(s) of Site Supervisor: Ron Walker  
Date Site inspection is requested: May 9, 1997

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction Permit No.: SC51-277316 Dated: May 17, 1996

Date: May 6, 1997

Darwish El-Hajji  
Signature of Professional Engineer



B

Appendix  
B

## Appendix B

# Hydrostatic Test Reports for Piping, Vessels and Tanks



3006 Northup Way  
Bellevue, WA 98004-1407

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

*A Division of Ionics, Incorporated*

April 18, 1997

PAS-L231

Camp Dresser & McKee Inc.  
Westshore Center  
1715 North Westshore Blvd, #875  
Tampa, FL 33607

Attention: Daniel Strobbridge

Subject: Hydro Test Data  
RCC Job 615

Dear Dan:

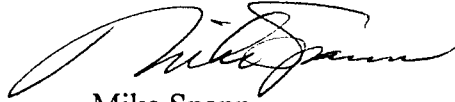
Enclosed are copies of hydrotest reports from our contractor/vendors on piping, vessels, and tanks:

R. Field/K. Ravencraft (Eclipse) - Field Piping  
Lauren Constructors - Skid Piping  
Frost & Associates - Skid Piping  
Alaskan Copper Works - Evaporator Condenser  
Alaskan Copper Works - Distillate Tank  
IAF - Seed Tank  
PMSC - Deaerator  
Palmer - Spray Dryer Feed Tank (T-300)  
Palmer - Sodium Sulfate Tank (T-014)

The field piping reports are complete except for the brine recirc. piping for the evaporator. The reports for the skid piping are short by about 25% - 30%. You will note that most of the reports on skid piping are by Frost & Associates, our Q.C. Consultant on the Lauren work. We are arranging for on-site hydro testing by Eclipse on the brine recirc. pipe and the skidded piping to make sure we have sufficient coverage for your permitting of the overall plant.

Very Truly Yours

RESOURCES CONSERVATION COMPANY

A handwritten signature in black ink, appearing to read "Mike Spann", with a large, sweeping initial "M".

Mike Spann  
Project Manager

Enclosures

# Hydro Test Report

Subsystem Name: EVAPORATOR / SPRAY DRYER / S.D. FEED TANK

Reference Dwgs: 615-MC-1 / 615-MA-1

[illegible]

Performed by:  
Date:

R. FIELDS / K. RAVENCRAFT  
2-26-97

Approved by:  
Date:

FOR  
2-26-97

# HYDRO Test Report

**Subsystem Name:**

Fixed

**Reference Dwgs:**

- 615-MG-1 / 615-M4-1

[illegible]

Performed by:  
Date:

R. Fields  
2-11-97

Approved by:  
Date:

FOR  
2-12-97

# HYDRO Test Report

**Subsystem Name:**

## UTILITIES / VAPOR COMPRESSOR

**Reference Dwgs:**

[illegible]

Performed by:  
Date:

R. FIELDS  
2-12-97

Approved by:  
Date:

2-12-97

# Hydro Test Report

Subsystem Name: INSTRUMENT AIR

Reference Dwgs: 615-MC-1/615-M4-1

[illegible]

Performed by:  
Date:

T. MOORE  
3-5-97

Approved by:  
Date:

*[Signature]*  
3-6-97

# Hydra Test Report

**Subsystem Name:**

# Boiler

**Reference Dwgs:**

- 615-MG-1 / 615-MA-1

[illegible]

Performed by:  
Date:

R. Fields  
2-6-97

Approved by:  
Date:

2-6-97

# HYDRO Test Report

**Subsystem Name:**

CHEM. ADD.

**Reference Dwgs:**

615-MC-1 / 615-M4-1

[illegible]

Performed by:  
Date:

K. RAVENCRAFT  
3-6-97

Approved by:  
Date:

FOR  
3-6-97



## FAX TRANSMITTAL

DATE: 4-16-97TO: RCL

FAX# \_\_\_\_\_

ATTN: MIKE SPANNA

CODE: \_\_\_\_\_

SENDER: JOHN HYLAND

We are transmitting 2 pages, including this cover sheet. If transmission is not complete, please call sender at (915)670-9660

Message: HERE IS A COPY OF OUR HYDROSTATIC  
TEST REPORT FOR THE FEED SKID. THIS TEST WAS  
NOT WITNESSED BY YOUR INSPECTOR SO MARK  
MCCLELLIN ASKED US TO DOCUMENT THE TEST.  
THE OTHER TWO SKIDS WERE HYDRO'D AND  
WITNESSED BY YOUR INSPECTOR TED NEELY. HE  
SHOULD HAVE DOCUMENTED THESE HYDROS AND  
SUBMITTED TO MARK. CHECK THE REPORTS  
TED NEELY SUBMITTED TO MARK MCCLELLIN.

A handwritten signature in black ink, appearing to be "John", written in a cursive style.

**FROST & ASSOCIATES, INC.**

INSPECTION, CONSULTANT, EXPEDITING, &amp; TECHNICAL SERVICES

**SURVEILLANCE REPORT****FA PROJECT NO.: RC-96001**

<b>REPORT NO.:</b> 05	<b>P.O. NO.:</b> 25817	<b>C.O. NO.:</b> 0
<b>Q.A. REP.:</b> Ted Neely	<b>DATE:</b> 04/26/96 4/26/96	
<b>CLIENT:</b> RCC	<b>JOB LOC.:</b> Abilene, Tx	

**SUPPLIER:** Lauren Constructor's INC.  
**LOCATION:** Abilene, TX  
**PRIME SUPPLIER:** Same  
**LOCATION:** Same  
**TAG ITEM(S):**

**SUPPLIER CONTACT:** John Hyland  
**SUPPLIER PHONE NO.:** 915-670-9660  
**SUPPLIER S/O NO.:**  
**PROJECT CONTACT:** John Mayne  
**PHONE NO.:** 915-677-1071

**DESCRIPTION:** Mechanical Skids

NO.	ACTIVITY:	%	LGD	REMARKS:
1.	PREFABRICATION	100	HP	
2.	SPECIFICATIONS, DATA SHEET	100	R	
3.	DRAWINGS	100	R	
4.	WELDING PROCEDURE SPECIFICATIONS	100	R	
5.	PERFORMANCE QUALIFICATION RECORDS	100	R	
6.	MATERIAL TEST REPORTS	90	R	
7.	NDE SPECIFICATIONS	100	R	
8.	NDE PERSONNEL QUALIFICATIONS	100	R	
9.	WELDING INSPECTION	75	W	
10.	A. WELD MATERIAL VERIFICATION	75	RI	
11.	B. JOINT PREPARATION/FIT-UP	75	RI	
12.	C. VISUAL AND DIMENSIONAL WELDMENTS	75	RI	
13.	ASSEMBLY - VISUAL AND DIMENSIONAL	75	W	
14.	NONDESTRUCTIVE EXAMINATION	75	R	
15.	STRESS RELIEF CHARTS	n/a	R	
16.	TESTING		HP	
17.	A. TEST PROCEDURES	100	R	
18.	B. HYDROSTATIC TESTS	33	W	
19.	C. TEST REPORTS/TEST CERTIFICATES		R	
20.	FINAL INSPECTION		HP	
21.	TAGGING		RI	
22.	CLEANING		RI	
23.	PAINTING/PROTECTIVE COATING			
24.	PREPARATION FOR SHIPMENT			
25.	DATA PACKAGE REVIEW			
26.	RELEASE NOTE		W	

LEGEND: W=WITNESS; V=VERIFY; M=MONITOR; RI=RANDOM INSPECT; RD=REVIEW DOCUMENTS

Tulsa, OK  
 Phone: (918) 342-5454  
 Fax: (918) 343-3207

  
 London, England  
 011-44-1-81-397-6818

Houston, TX  
 Phone: (713) 350-3540  
 Fax: (713) 350-1250

**FROST & ASSOCIATES, INC.**  
INSPECTION, CONSULTANT, EXPEDITING, & TECHNICAL SERVICES

**SURVEILLANCE REPORT**

**REPORT NO.: 05**

**DATE: 04/26/96**

**P.O. NO.: 25817**

**NARRATIVE:** Surveillance inspection was conducted at Lauren Constructors INC, at Abilene, Tx the week of 04/26/96 to perform inprocess inspections of Evaporator Equipment Skid, Feed Skid and Deaerator/Distillate tower Skid, and perform Hydrostatic test. See inspection for results.

**ENGINEERING:** The drawings for all three skid assemblies have been issued.

**MATERIAL:** The material has been received except for the following items:

**EVAPORATOR SKID**

A. Two 2 ladders to access 10'0" elevation.

**FEED SKID**

A. One ladder to access 10'0" elevation

**DEAERATOR/DISTILLATE TOWER SKID**

A. Ladders to access three (3) platforms.

B. Tabs to interface.

The items listed above are being constructed by others, and are to be delivered to Lauren Constructor's INC. Abilene, Tx April 29, 1996.

**FABRICATION:** Fabrication is in process per drawings:

9525-P1

9525-P2

9525-P3

9525-P4

**INSPECTION:** Inprocess Surveillance inspection was performed on three Skid assemblies. The following items were verified, Fit up gap on inprocess butt welds, Socket engagement for socket welds, Final visual inspection of those welds completed, verified configuration on those items welded and tacked in place. Also Verified X-rays for thoses welds which were X-rayed. Quality of those items installed and welded was excellent. Work process on Deaerator\Distillate Tower is proceeding in a timely manner. On Deaerator\Distillate Tower performed Hydrostatic test on the line listed below . Gauge # LC01, due date 08/02/96.

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Fax: (918) 343-3207



London, England

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Houston, TX

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***FROST & ASSOCIATES, INC.***  
INSPECTION, CONSULTANT, EXPEDITING, & TECHNICAL SERVICES

**SURVEILLANCE REPORT**

**REPORT NO.: 05**

**DATE: 04/26/96**

**P.O. NO.: 25817**

---

<u>Line Number</u>	<u>Test Pressure</u>
AS-102	75PSI
EP-102	75PSI
EP-109	100PSI
FE-104	100PSI
FE-105	75PSI
SEW-101	75PSI

Line # CD-101, CD-102, need to have unions installed prior to Hydro Test, also missing valve KV1205 therefore line ep-107 still needs testing.

The remaining lines listed above and lines on the other two skid assemblies will be Hydrostatic Tested on Tuesday April 29, 1996.

**ACTION ITEMS:** None.

**Q.A. REPRESENTATIVE:** Ted Neely

**ATTACHMENTS** YES ☐ NO ☒

---

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Fax: (918) 343-3207

  
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011-44-1-81-397-6818

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**FROST & ASSOCIATES, INC.**  
INSPECTION, CONSULTANT, EXPEDITING, & TECHNICAL SERVICES

**SURVEILLANCE REPORT**

**FA PROJECT NO.:** RC-96001

<b>REPORT NO.:</b> 06	<b>P.O. NO.:</b> 25817	<b>C.O. NO.:</b> 00
<b>Q.A. REP.:</b> Ted Neely	<b>DATE:</b> 04/30/96 ✓✓✓✓✓✓✓✓✓✓	
<b>CLIENT:</b> RCC	<b>JOB LOC.:</b> Abilene, Tx	

**SUPPLIER:** Lauren Constructor's INC.  
**LOCATION:** Abilene, TX  
**PRIME SUPPLIER:** Same  
**LOCATION:** Same  
**TAG ITEM(S):**

**SUPPLIER CONTACT:** John Hyland  
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**SUPPLIER S/O NO.:**  
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7.	NDE SPECIFICATIONS	100	R	
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12.	C. VISUAL AND DIMENSIONAL WELDMENTS	75	RI	
13.	ASSEMBLY - VISUAL AND DIMENSIONAL	75	W	
14.	NONDESTRUCTIVE EXAMINATION	75	R	
15.	STRESS RELIEF CHARTS	n/a	R	
16.	TESTING		HP	
17.	A. TEST PROCEDURES	100	R	
18.	B. HYDROSTATIC TESTS	33	W	
19.	C. TEST REPORTS/TEST CERTIFICATES		R	
20.	FINAL INSPECTION		HP	
21.	TAGGING		RI	
22.	CLEANING		RI	
23.	PAINTING/PROTECTIVE COATING			
24.	PREPARATION FOR SHIPMENT			
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26.	RELEASE NOTE		W	

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Phone: (713) 350-3540  
Fax: (713) 350-1250

**FROST & ASSOCIATES, INC.**  
INSPECTION, CONSULTANT, EXPEDITING, & TECHNICAL SERVICES

**SURVEILLANCE REPORT**

**REPORT NO.:** 06

**DATE:** 04/30/96

**P.O. NO.:** 25817

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**FEED SKID**

A. One ladder to access 10'0" elevation

**DEAERATOR/DISTILLATE TOWER SKID**

A. Ladders to access three (3) platforms.

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9525-P1

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9525-P3

9525-P4

**INSPECTION:**

In-process Surveillance inspection was performed on three Skid assemblies. The following items were verified, Fit up gap on in-process butt welds, Socket engagement for socket welds, Final visual inspection of those welds completed, verified configuration on those items welded and tacked in place. Also Verified X-rays for those welds which were X-rayed. Quality of those items installed and welded was excellent. Work process on Deaerator/Distillate Tower is proceeding in a timely manner. On Deaerator/Distillate Tower performed Hydrostatic test on the line listed below. Gauge # LC01, due date 08/02/96. On the Evaporator Skid performed Hydrostatic Test on the lines listed below. Gauge #LCO1 due date 08/02/96.

Tulsa, OK  
Phone: (918) 342-5454  
Fax: (918) 343-3207

  
London, England  
011-44-1-81-397-6818

Houston, TX  
Phone: (713) 350-3540  
Fax: (713) 350-1250

**FROST & ASSOCIATES, INC.**  
INSPECTION, CONSULTANT, EXPEDITING, & TECHNICAL SERVICES

**SURVEILLANCE REPORT**

**REPORT NO.: 06**

**DATE: 04/30/96**

**P.O. NO.: 25817**

**DEAERATOR/DISTILLATE TOWER**

<u>Line Number</u>	<u>Test Pressure</u>
IA-103	150 PSI
IA-107	150 PSI
IA-108	150 PSI
EP-107	100 PSI
CD-101	75 PSI
CD-102	75 PSI

**EVAPORATER SKID**

<u>Line Number</u>	<u>Test Pressure</u>
IA-101	150 PSI
IA-102	150 PSI
IA-104	150 PSI
SEW 101-THRU 108	75 PSI
SW 101 THRU 104	100 PSI
EP-104 THRU 104	100 PSI
EP- 109	100 PSI
FE-104	100 PSI

During surveillance inspection the following items were rejected.

1. Specification requires minimum fillet weld size of 3/16". Pipe support on all three skids have welds which are less than 1/8" which is not acceptable.
2. During installation of hand rails holes were burned in I beam's to facilitate installation of hand rails. Holes in some cases are slotted twice the bolt size.
3. Hand rails were not sand blasted properly and have sharp edges on them that could become a personnel safety concern, along with not providing sufficient area for coating adhesion.
4. Weld splatter is around most welds on Feed Skids and needs to be cleaned off.
5. It was also noted that exposed openings were not covered, i.e. flange openings and vessels.

**ACTION ITEMS:** Items which were rejected will require resolution prior to shipping.

**Q.A. REPRESENTATIVE:** Ted Neely

**ATTACHMENTS** YES ☐ NO ☒

Tulsa, OK  
Phone: (918) 342-5454  
Fax: (918) 343-3207

  
London, England  
011-44-1-81-397-6818

Houston, TX  
Phone: (713) 350-3540  
Fax: (713) 350-1250

# ALASKAN *Works* COPPER

Telephone: (206) 823-5800

Telex: 92-0318

TWX: 910-444-2095

Facsimile:

Stainless Products Division

(206) 382-7346

Fabrication Division

(206) 382-4305

Mailing Address:

Post Office Box 3546

Seattle, Washington 98124-3546

Express Delivery Address:

Stainless Products Division

3200 Sixth Avenue South

Seattle, Washington 98134-2106

Fabrication Division

3405 Sixth Avenue South

Seattle, Washington 98134-2108

To: RESOURCES CONSERVATION COMP.  
3006 NORTUP WAY  
BELLEVUE WA 98004

Ref: Purchase Order No. 25479  
 Alaskan Order No. 48925

46"OD CONDENSER SHELL SIDE 18 PSI \* 3-15-96  
CONDENSER TUBE SIDE 3 PSI \* 4-26-96

We hereby certify that these items have been hydrostatically tested to # PSIG.

ALASKAN COPPER WORKS

By *John Olson*  
 Q. A. Manager

Date 4-16-97

ATTN: SA JAMES T.

# ALASKAN *Works* COPPER

Telephone: (206) 823-5800  
 Telex: 32-0318  
 TWX: 810-444-2095  
 Facsimile:  
 Stainless Products Division  
 (206) 382-7348  
 Fabrication Division  
 (206) 382-4308

Mailing Address:  
 Post Office Box 3546  
 Seattle, Washington 98124-3546  
 Express Delivery Address:  
 Stainless Products Division  
 3200 Sixth Avenue South  
 Seattle, Washington 98134-2108  
 Fabrication Division  
 3405 Sixth Avenue South  
 Seattle, Washington 98134-2108

To: RESOURCES CONSERVATION CO.  
3006 NORTUP WAY  
BELLEUE WASH. 98004

Ref: Purchase Order No. 25679  
 Alaskan Order No. 49060

30"OD DISTILLATE TANK . T-110 (12-14-95)

We hereby certify that these items have been hydrostatically tested to 18 PSIG.

ALASKAN COPPER WORKS

By John Olson  
 Q. A. Manager

Date 4-16-97

**IAF** INDUSTRIAL ALLOY FABRICATORS  
INC.

2345 QUINCE STREET, FOREST GROVE, OREGON 97116 / 503-359-0793 / TELEFAX: 503-359-9292

TELEFAXDATE: 4-16-97REFERENCE: RCCTO: RCCP.O.# 25678ATTN: KEVIN BURSTEADFROM: DEAN HUDSONSHEET 1 OF 2ATTACHED PLEASE FIND JOB TRAVELER FOR YOUR P.O.#25678- SEED TANK. ALSO NONREPLETE COPY & MATERIALCERTIFICATIONS. ARE ON FILE AND AVAILABLE UPON REQUEST.DeanHEAD HYDRO  
STATIC TEST FOR SEED TANK



# INDUSTRIAL ALLOY FABRICATORS

SERIAL NO.: 95299

2345 QUINCE STREET, FOREST GROVE, OREGON 97116 / 503-359-0793 / TELEFAX: 503-359-8292

NON CODE PROJECT JOB TRAVELER

**CUSTOMER:**

RCC (P.O.#25678)

LAF JOB # 95299

DRAWING # 95 259

REV. #

DATE 11/9

REVIEW DWGS, CALCS, & PICK- <del>HOLD</del> POINTS		MECH	CUST	A.I.	OCT	DATE
HOLD POINTS:					DA	"10/95
WELDER ID	WPS	WELDER ID	WPS	<b>NON CODE</b>		
MM	MM 309					
MM	MM 100					
MM	MM 317L					
MM	MM CB-20-D					
MM	TM 317L					
FINAL VISUAL & DIMENSIONAL						
SHELL SIDE HYDRO: gauge # <u>N/A/STATIC</u>					DA	"12/85
psig+ head= <u>HEAD</u> psig					DA	"12/85
gauge # _____					/	/
psig+ head= _____ psig					/	/
SPECIAL REQUIREMENTS						
<del>* STATIC HEAD HYDRO ONLY.</del>						
NDE <u>NONE</u>						
VERIFY MAT'L MTRS					DL	"12/85
NAME PLATE <u>N/A</u>					DA	"12/89

# NON CODE



3000 FITE ROAD. MEMPHIS, TENN.

## PRESSURE TEST REPORT

PMSC SERIAL NO. <u>Y-974</u>	CUSTOMER <u>RCC</u>
DESCRIPTION <u>(1) DEAERATOR</u> <u>ITEM T-101</u>	
DATE OF TEST <u>1/25/96</u>	<u>SH</u> ELL SIDE <u>✓</u> <u>✓</u> <u>TS</u> IDE

## TEST CONDITIONS

KIND OF TEST	HYDRO <u>X</u> PNEUMATIC <u>    </u> FILL WITH WATER <u>    </u>
MAX. DESIGN PRESS.	<u>Shell</u> <u>FV/12</u> PSIG <u>TS</u> <u>✓</u> <u>✓</u> PSIG <u>SIDE</u>
TEST PRESSURE	<u>18</u> PSIG <u>✓</u> <u>✓</u> PSIG
HOLDING TIME	<u>5/8</u> <u>12+</u> HRS. TEMPERATURE <u>AMB</u> °F <u>TS</u> <u>X</u> <u>X</u>
GAUGE RANGE	<u>5/8</u> <u>0-60</u> DATE CALIBRATED <u>5/8</u> <u>12-10-95</u> <u>TS</u> <u>X</u> <u>X</u> <u>TS</u> <u>X</u> <u>X</u>
GAUGE NO.	<u>5/8</u> <u>6012</u> EXPIRATION DATE <u>5/8</u> <u>6-10-96</u> <u>TS</u> <u>X</u> <u>X</u> <u>TS</u> <u>X</u> <u>✓</u>

SKETCH OF TEST LAYOUT  
(show location of gauges & fill lines)

RESULT Satisfactory

SIGNED: Tom Nichols

SIGNED: \_\_\_\_\_

SPRAY DRYER FEED  
& SODIUM SULPHATE TASKS



DATE 4-18-97

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME Bo BAILEY

COMPANY RCC

CITY AND STATE \_\_\_\_\_

FAX NUMBER 206-828-0526

FROM:

NAME James Varn  
PALMER OF TEXAS  
ANDREWS, TEXAS

WE ARE TRANSMITTING 3 PAGES  
(Including this cover letter)

IF TRANSMISSION IS NOT COMPLETE:

PLEASE CALL 915/523-5904

ASK FOR \_\_\_\_\_

PALMER OF TEXAS FAX NUMBER: 915/523-9601

## CERTIFICATION OF HYDROSTATIC TEST

Per section 6.3.2 of specification No. ASTM-3299  
a Hydro Test was performed on the item No. T-300  
to a pressure of ATMOS. lbs/sq.in. and held at this pressure for  
a duration of 24 hours.

J. J. [Signature] Test Personnel

5/19/96 Date

James Varns Attest

5/19/96 Date

## CERTIFICATION OF HYDROSTATIC TEST

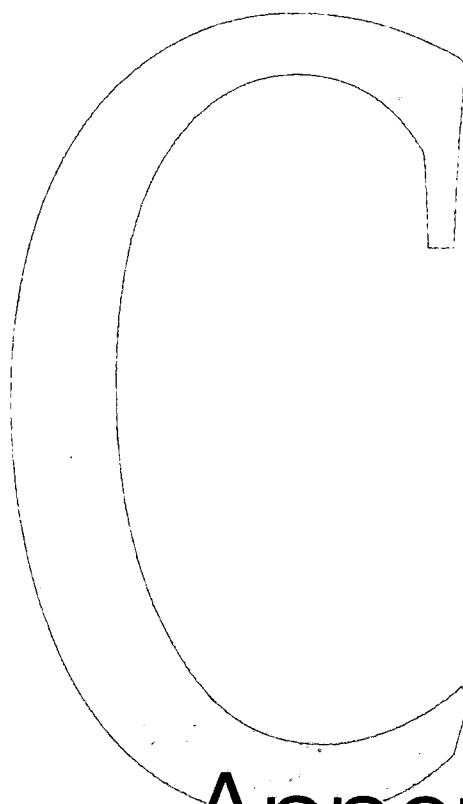
Per section 6.3,2 of specification No. ASTM - 3299  
a Hydro Test was performed on the item No. T- 014  
to a pressure of ATMOS, lbs/sq.in. and held at this pressure for  
a duration of 24 hours.

JS Test Personnel

5/19/96 Date

James Varna Attest

5/19/96 Date



# Appendix C

## Appendix C

# Concrete Foundation Subgrade Density Tests, Concrete Comprehensive Strength Tests and Limerock and Asphalt Tests



PASCO COUNTY UTILITIES

FEB 10 1997

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: January 16, 1997

OUR REPORT NO.: 390-60054-31

TEST DATA: (3) GRAYISH BROWN FINE SAND WITH TRACE OF ROOTS AND ORGANICS OPT. MOIST. = 10.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	Spec. COMMENTS	98% Min
1	12"	0-12"	3	109.0	5.1	113.6	108.1	99.2	4 - A	
2	12"	0-12"	3	109.0	6.6	113.8	106.8	98.0	4 - A	
3	12"	0-12"	3	109.0	5.4	114.6	108.7	99.7	4 - A	
4	12"	0-12"	3	109.0	6.2	113.8	107.2	98.3	4 - A	

TEST LOCATION: SUBGRADE SOILS FOR ROAD AND PARKING AREA FOR PROCESSING BUILDING

- 50' east and 5' north of the northeast corner of building - centerline
- 75' E. and 10' S. of the S.E. corner of building - left of centerline
- 80' S. and 30' E. of the S.W. corner of building - right of centerline
- 5' E. and 95' N. of the N.W. corner of building (curb area)

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry  
density obtained on sample indicated by  
\* (3) soil ID number - 1557

TROXLER, 3430

TEST INSTRUMENT:

REMARKS: 0 = Top of subgrade

TECHNICIAN: B. SMITH

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

557 2890

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: January 22, 1997

OUR REPORT NO.: 390-60054-32

TEST DATA: (30) LIMEROCK OPT. MOIST. = 13.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	Spec. COMMENTS* 98% Min
1	4"	0	30	113.0	11.2	124.9	112.3	99.4	3 - A
2	4"	0	30	113.0	12.4	127.8	113.7	100.6	3 - A

TEST LOCATION: BASE COURSE

- 1 75' N. and 12' W. of the N.W. corner of treatment process bldg. (6")
- 2 42' E. and 18' N. of the S.E. corner of treatment process bldg. (6")

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry  
density obtained on sample indicated by  
\* (30) Soil ID Number D-1557

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER, 3430

REMARKS: 0 = Top of base course

TECHNICIAN: T. WADDELL

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

DAILY FIELD REPORT

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: January 23, 1997

OUR REPORT NO.: 390-60054-33

WEATHER: CLEAR

TEMPERATURE RANGE: --- TO: ---

INSPECTOR: B. SMITH

TYPE OF INSPECTION BEING PERFORMED

<input type="checkbox"/> SOILS	<input type="checkbox"/> CONCRETE
<input type="checkbox"/> FOUNDATIONS	<input type="checkbox"/> BATCH PLANT
<input type="checkbox"/> CONTROLLED FILL (COMPACTION)	<input type="checkbox"/> PLACEMENT (JOB SITE)
<input type="checkbox"/> _____	<input type="checkbox"/> _____
<input checked="" type="checkbox"/> ASPHALT	<input type="checkbox"/> OTHER
<input type="checkbox"/> BATCH PLANT	<input type="checkbox"/> _____
<input type="checkbox"/> PLACEMENT (JOB SITE)	<input type="checkbox"/> _____
<input checked="" type="checkbox"/> SAMPLE PICK UP	<input type="checkbox"/> _____

BRIEF RESUME OF WORK ACCOMPLISHED THIS DATE:

As requested, a representative of our firm was on-site to obtain a hot mix sample of Type S-III asphaltic concrete. The sample was returned to our laboratory for Extraction/Gradation, Stability and Flow analyses. The results of our laboratory will be submitted under a separate cover letter subsequent to testing.

Respectfully submitted,  
Professional Service Industries, Inc.

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

# EXTRACTION/GRADATION, STABILITY AND FLOW TEST RESULTS

Client: PASCO COUNTY BOARD OF COMMISSIONERS	Project #: 390-60054-34
Project: LEACHATE STORAGE TANK FACILITY	Date: JANUARY 30, 1997

## LABORATORY ANALYSIS OF ASPHALT MIXTURE

Date Sampled: JANUARY 23, 1997	Type of Mix: TYPE S-III
Sampled By: B. SMITH	Producer: Overstreet
Approved By: J. SANSONE	Tested By: R. ESTEVEZ

Sample Location: SERVICE ROAD FOR PROCESSING BUILDING

SIEVE ANALYSIS			MARSHALL SPECIMEN DATA			
Standard Sieve Size	Percent Passing by Weight	F.D.O.T. Design Specification	Specimen Number	1	2	3
3/4"	---	---	Stability (lbs)	3620	3000	3230
1/2"	100	100	Flow (0.1")	9	9	9
3/8"	98.70	88-100	Specific Gravity	----	----	----
# 4	73.10	60-90	Density (pcf)	139.3	138.5	138.7
# 10	55.00	40-70				
# 40	38.80	20-45	Avg. Stability (lbs)	3280	Max. Theo. Sp. Gravity	--
# 80	16.70	10-30	Avg. Flow (0.1")	9	Bulk Specific Gravity	--
# 200	7.59*	2-6	Avg. Density (pcf)	138.8		

Remarks: Slightly outside the design specification range

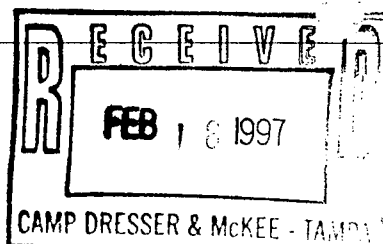
Sieve Analysis Meets Specifications: SEE NOTES

MARSHALL PROPERTIES			
Properties	Results	Specification	Meets Specifications
Bituminous Content (%)	6.21	5.5 min.	Yes
Minimum VMA (%)	-	-	-
% Voids Filled	-	-	-
% Voids Total Mix	-	-	-
Avg. Lab. Density (pcf)	138.8	NA	NA
Avg. Stability (lbs)	3280	1500 Min.	Yes
Flow (0.1")	9	8-16	Yes

Notes: The above sample is in general accordance with Florida Department of Transportation Specifications for Type S-III Asphaltic Concrete (latest revision)



Respectfully Submitted,  
PSI



## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: January 16, 1997

OUR REPORT NO.: 390-60054-30

### TEST DATA

Visual Classification LIMEROCK

Sample Source ROADWAY

Method of Test ASTM D-1557

Rammer: Mechanical Method of Preparation: Moist

#### Test Results

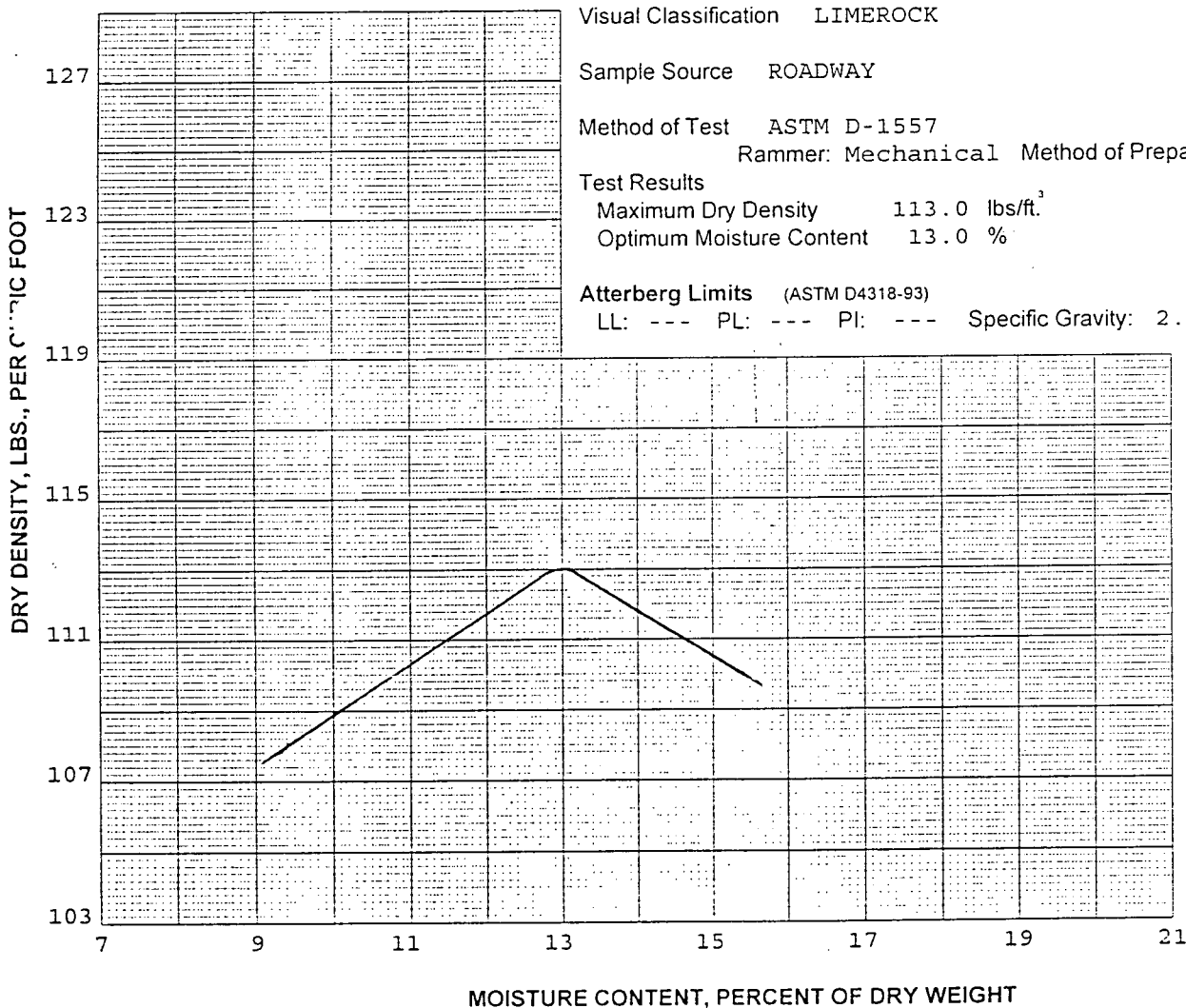
Maximum Dry Density 113.0 lbs/ft.<sup>3</sup>

Optimum Moisture Content 13.0 %

Atterberg Limits (ASTM D4318-93)

LL: --- PL: --- PI: --- Specific Gravity: 2.59 (estimate)

Grain Size Analysis  
(ASTM C136-93 AND/OR C117-90)  
Sieve Size Percent Passing



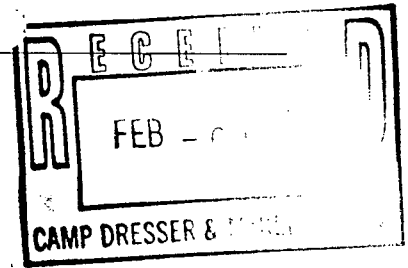
REMARKS:

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*



## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: January 16, 1997

OUR REPORT NO.: 390-60054-31

TEST DATA: (3) GRAYISH BROWN FINE SAND WITH TRACE OF ROOTS AND ORGANICS OPT. MOIST. = 10.5%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	Spec. COMMENTS* 98% Min
1	12"	0-12"	3	109.0	5.1	113.6	108.1	99.2	4 - A
2	12"	0-12"	3	109.0	6.6	113.8	106.8	98.0	4 - A
3	12"	0-12"	3	109.0	5.4	114.6	108.7	99.7	4 - A
4	12"	0-12"	3	109.0	6.2	113.8	107.2	98.3	4 - A

TEST LOCATION: SUBGRADE SOILS FOR ROAD AND PARKING AREA FOR PROCESSING BUILDING

- 1 50' east and 5' north of the northeast corner of building - centerline
- 2 75' E. and 10' S. of the S.E. corner of building - left of centerline
- 3 80' S. and 30' E. of the S.W. corner of building - right of centerline
- 4 5' E. and 95' N. of the N.W. corner of building (curb area)

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:

DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry  
density obtained on sample indicated by  
\* (3) soil ID number - 1557

- 1 FILL MATERIAL
- 2 BACKFILL
- 3 BASE COURSE
- 4 SUBBASE
- 5 SOIL CEMENT
- 6 OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

557 2890

TEST INSTRUMENT: TROXLER, 3430  
REMARKS: 0 = Top of subgrade

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

TECHNICIAN: B. SMITH

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information To Build On

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: January 22, 1997

OUR REPORT NO.: 390-60054-32

TEST DATA: (30) LIMEROCK OPT. MOIST. = 13.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	Spec. COMMENTS* 98% Min
1	4"	0	30	113.0	11.2	124.9	112.3	99.4	3 - A
2	4"	0	30	113.0	12.4	127.8	113.7	100.6	3 - A

TEST LOCATION: BASE COURSE

- 75' N. and 12' W. of the N.W. corner of treatment process bldg. (6")
- 42' E. and 18' N. of the S.E. corner of treatment process bldg. (6")

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by  
\* (30) Limerock Opt. Moist. = 13.0%

- FILL MATERIAL
- BACKFILL
- BASE COURSE
- SUBBASE
- SOIL CEMENT
- OTHER

- TEST RESULTS COMPLY WITH SPECIFICATIONS
- PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- RETEST OF PREVIOUS TEST
- MOISTURE IN EXCESS OF SPECIFICATIONS
- MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER, 3430

REMARKS: 0 = Top of base course

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

TECHNICIAN: T. WADDELL

: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

Respectfully submitted,  
Professional Service Industries, Inc.

DAILY FIELD REPORT

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: January 23, 1997

OUR REPORT NO.: 390-60054-33

WEATHER: CLEAR

TEMPERATURE RANGE: --- TO: ---

INSPECTOR: B. SMITH

TYPE OF INSPECTION BEING PERFORMED

\_\_\_ SOILS

\_\_\_ CONCRETE

\_\_\_ FOUNDATIONS

\_\_\_ BATCH PLANT

\_\_\_ CONTROLLED FILL (COMPACTION)

\_\_\_ PLACEMENT (JOB SITE)

X ASPHALT

\_\_\_ OTHER

\_\_\_ BATCH PLANT

\_\_\_ PLACEMENT (JOB SITE)

X SAMPLE PICK UP

BRIEF RESUME OF WORK ACCOMPLISHED THIS DATE:

As requested, a representative of our firm was on-site to obtain a hot mix sample of Type S-III asphaltic concrete. The sample was returned to our laboratory for Extraction/Gradation, Stability and Flow analyses. The results of our laboratory will be submitted under a separate cover letter subsequent to testing.

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 07, 1996

OUR REPORT NO.: 390-60054-19

TEST DATA: (4) BROWN FINE SAND WITH A TRACE OF ROOTS OPT. MOIST. = 11.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec.	95% Min
1	12"	0	4	108.0	6.8	111.0	103.9	96.2	4 - A	

### TEST LOCATION: SUBGRADE SOIL

1 East acid storage building, in center of pad

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS: 1. FILL MATERIAL 2. BACKFILL 3. BASE COURSE 4. SUBBASE 5. SOIL CEMENT 6. OTHER  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (4) ASTM D-1557

TEST INSTRUMENT: TROXLER, 3401-B, 16926

STANDARD COUNT M: 491 D: 2426

REMARKS: PSI DID NOT MONITOR THE FILL PLACEMENT.

ADJUSTMENT DATA M: D:

0 = Top of subgrade

TECHNICIAN: K. KEEGAN

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK & TREATMENT FACILITY

DATE: September 26, 1996

REVISION #1  
OUR REPORT NO.: 390-60054-10

TEST DATA: (4) BROWN FINE SAND WITH A TRACE OF ROOTS OPT. MOIST. = 11.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Min
1	12"	TOSG	4	108.0	8.2	116.7	107.9	99.9	6 - A
2	12"	TOSG	4	108.0	5.5	108.9	103.2	95.6	6 - A
3	12"	TOSG	4	108.0	5.4	112.1	106.4	98.5	6 - A

### TEST LOCATION: SUBGRADE SOIL

1	20' east of the northwest corner of house pad
2	10' east of the northwest corner of evaporator pad
3	2' south and 2' east of the northwest corner

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

\* (4) ASTM D-1557  
TEST INSTRUMENT: TROXLER

REMARKS: PSI DID NOT MONITOR THE FILL PLACEMENT.  
TOSG = Top of Subgrade

STANDARD COUNT M: D:  
ADJUSTMENT DATA M: D:

TECHNICIAN: K. KEEGAN

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

RECEIVED

AUG 01 1996

WHARTON-SMITH, INC.

REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: July 09, 1996

OUR REPORT NO.: 390-60054-1

TEST DATA: (4) BROWN FINE SAND WITH A TRACE OF ROOTS OPT. MOIST. = 11.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec.	95% Min
1	12"	4'BEG	4	108.0	3.6	112.0	108.1	100.1	6 - A	
2	12"	4'BEG	4	108.0	2.9	112.0	108.8	100.7	6 - A	
3	12"	1'AEG	3	109.0	9.4	116.9	106.9	98.1	6 - A	
	12"	2'AEG	3	109.0	6.9	114.9	107.5	98.6	6 - A	
5	12"	3'AEG	3	109.0	6.7	115.2	108.0	99.1	6 - A	

TEST LOCATION:

1	5' north of center of proposed tank
2	5' south of the northeast side of proposed tank
3	15' north, 10' east of the southwest corner of bldg pad (process bldg.)
4	10' north, 8' east of the southwest corner of bldg. pad (process bldg.)
5	5' north, 3' east of the southwest corner of bldg. pad (process bldg.)

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.  
\* (4) ASTM D-1557

1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

- A. TEST RESULTS COMPLY WITH SPECIFICATIONS
- B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
- C. RETEST OF PREVIOUS TEST
- D. MOISTURE IN EXCESS OF SPECIFICATIONS
- E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER, 16926

STANDARD COUNT M: 600 D: 2980  
ADJUSTMENT DATA M: D:

REMARKS: PSI DID NOT MONITOR THE FILL PLACEMENT.

BEG - Below Existing Grade

AEG = Above Existing Grade

TECHNICIAN: B. SMITH

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

Information To Build On

## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: July 09, 1996

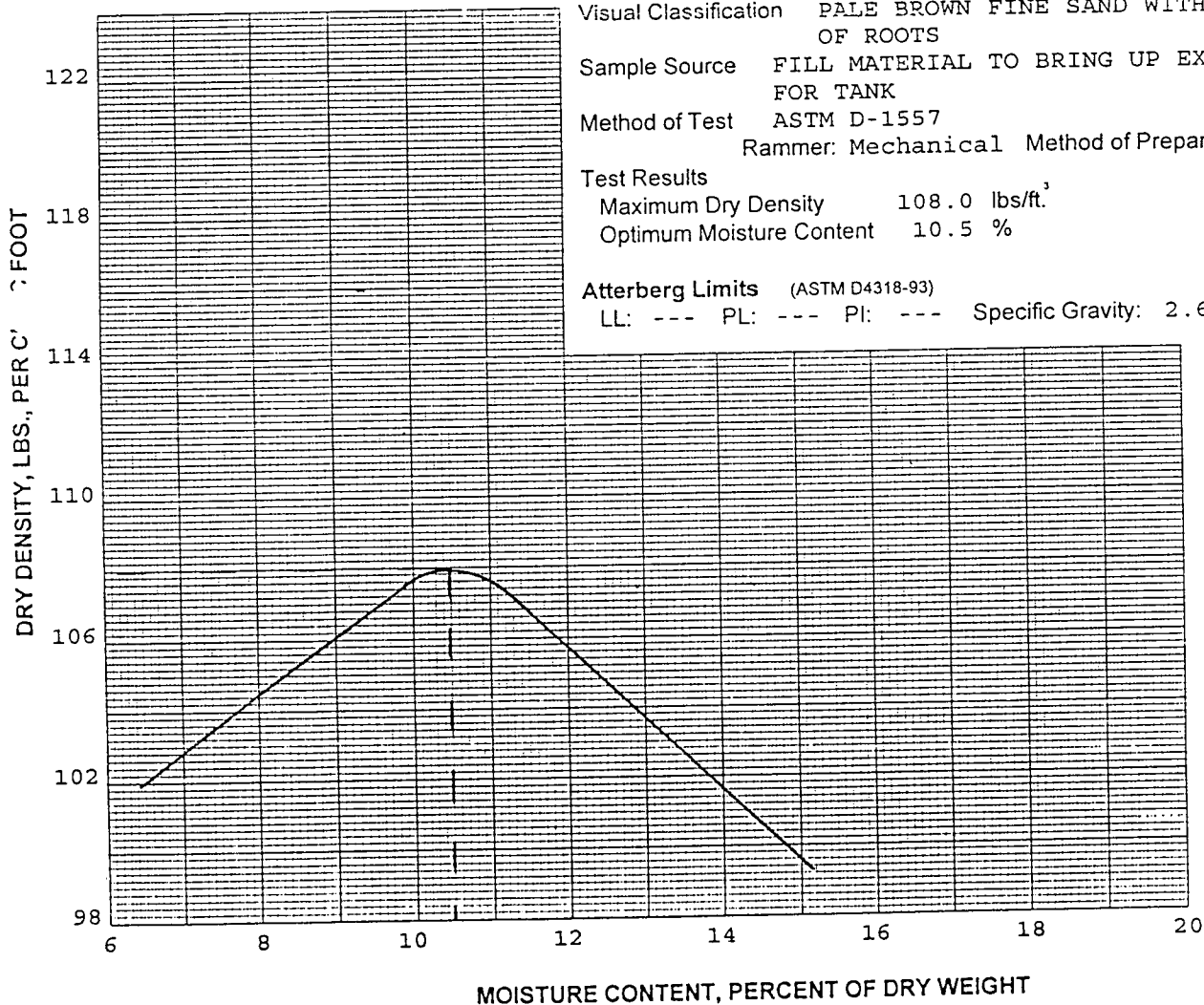
OUR REPORT NO.: 390-60054-2

### TEST DATA

Visual Classification PALE BROWN FINE SAND WITH A TRACE  
OF ROOTS  
Sample Source FILL MATERIAL TO BRING UP EXISTING GRADE  
FOR TANK  
Method of Test ASTM D-1557  
Rammer: Mechanical Method of Preparation: Moist  
Test Results  
Maximum Dry Density 108.0 lbs/ft.<sup>3</sup>  
Optimum Moisture Content 10.5 %

Atterberg Limits (ASTM D4318-93)  
LL: --- PL: --- PI: --- Specific Gravity: 2.60 (estimate)

Grain Size Analysis  
(ASTM C136-93 AND/OR C117-90)  
Sieve Size Percent  
Passing



REMARKS:

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: July 09, 1996

OUR REPORT NO.: 390-60054-1

TEST DATA: (4) BROWN FINE SAND WITH A TRACE OF ROOTS OPT. MOIST. = 11.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec.	95% Min
1	12"	4' BEG	4	108.0	3.6	112.0	108.1	100.1	6 - A	
2	12"	4' BEG	4	108.0	2.9	112.0	108.8	100.7	6 - A	
3	12"	1' AEG	3	109.0	9.4	116.9	106.9	98.1	6 - A	
4	12"	2' AEG	3	109.0	6.9	114.9	107.5	98.6	6 - A	
5	12"	3' AEG	3	109.0	6.7	115.2	108.0	99.1	6 - A	

### TEST LOCATION:

1	5' north of center of proposed tank
2	5' south of the northeast side of proposed tank
3	15' north, 10' east of the southwest corner of bldg pad (process bldg.)
4	10' north, 8' east of the southwest corner of bldg. pad (process bldg.)
5	5' north, 3' east of the southwest corner of bldg. pad (process bldg.)

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS:  
DENSITIES SHOWN: Lbs. per cubic foot  
WATER CONTENT: Percent of dry weight  
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

1. FILL MATERIAL  
2. BACKFILL  
3. BASE COURSE  
4. SUBBASE  
5. SOIL CEMENT  
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATIONS  
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS  
C. RETEST OF PREVIOUS TEST  
D. MOISTURE IN EXCESS OF SPECIFICATIONS  
E. MOISTURE BELOW SPECIFICATIONS

\* (4) ASTM D-1557

TEST INSTRUMENT: TROXLER, 16926

REMARKS: PSI DID NOT MONITOR THE FILL PLACEMENT.

BEG - Below Existing Grade

AEG = Above Existing Grade

TECHNICIAN: B. SMITH

STANDARD COUNT M: 600 D: 2980  
ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
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*Information To Build On*

## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

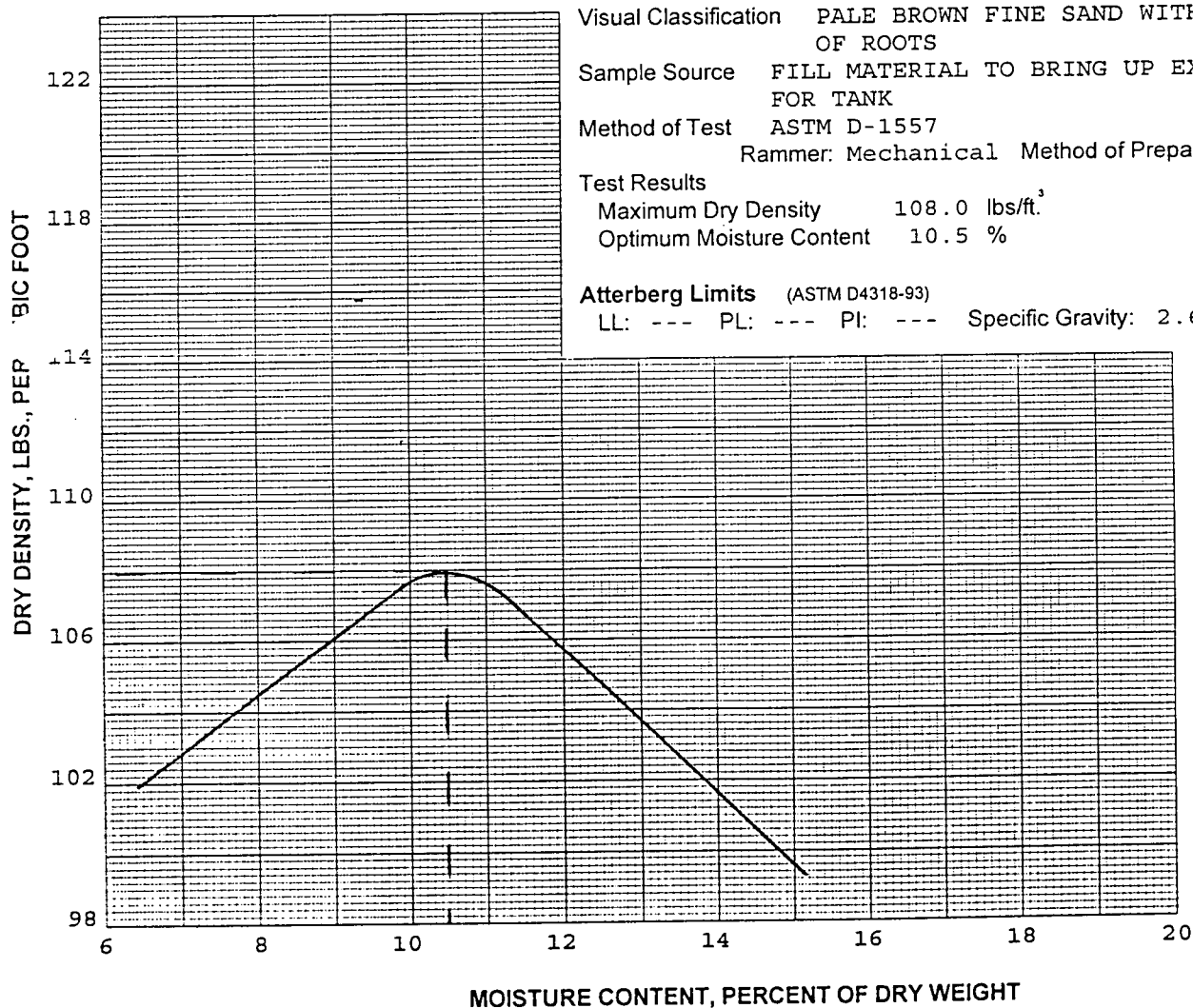
DATE: July 09, 1996

OUR REPORT NO.: 390-60054-2

### TEST DATA

Visual Classification PALE BROWN FINE SAND WITH A TRACE  
OF ROOTS  
Sample Source FILL MATERIAL TO BRING UP EXISTING GRADE  
FOR TANK  
Method of Test ASTM D-1557  
Rammer: Mechanical Method of Preparation: Moist  
Test Results  
Maximum Dry Density 108.0 lbs/ft.<sup>3</sup>  
Optimum Moisture Content 10.5 %  
Atterberg Limits (ASTM D4318-93)  
LL: --- PL: --- PI: --- Specific Gravity: 2.60 (estimate)

**Grain Size Analysis**  
(ASTM C136-93 AND/OR C117-90)  
Sieve Size Percent Passing



REMARKS:

Respectfully submitted,  
Professional Service Industries, Inc.

CC: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

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*Information To Build On*

## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

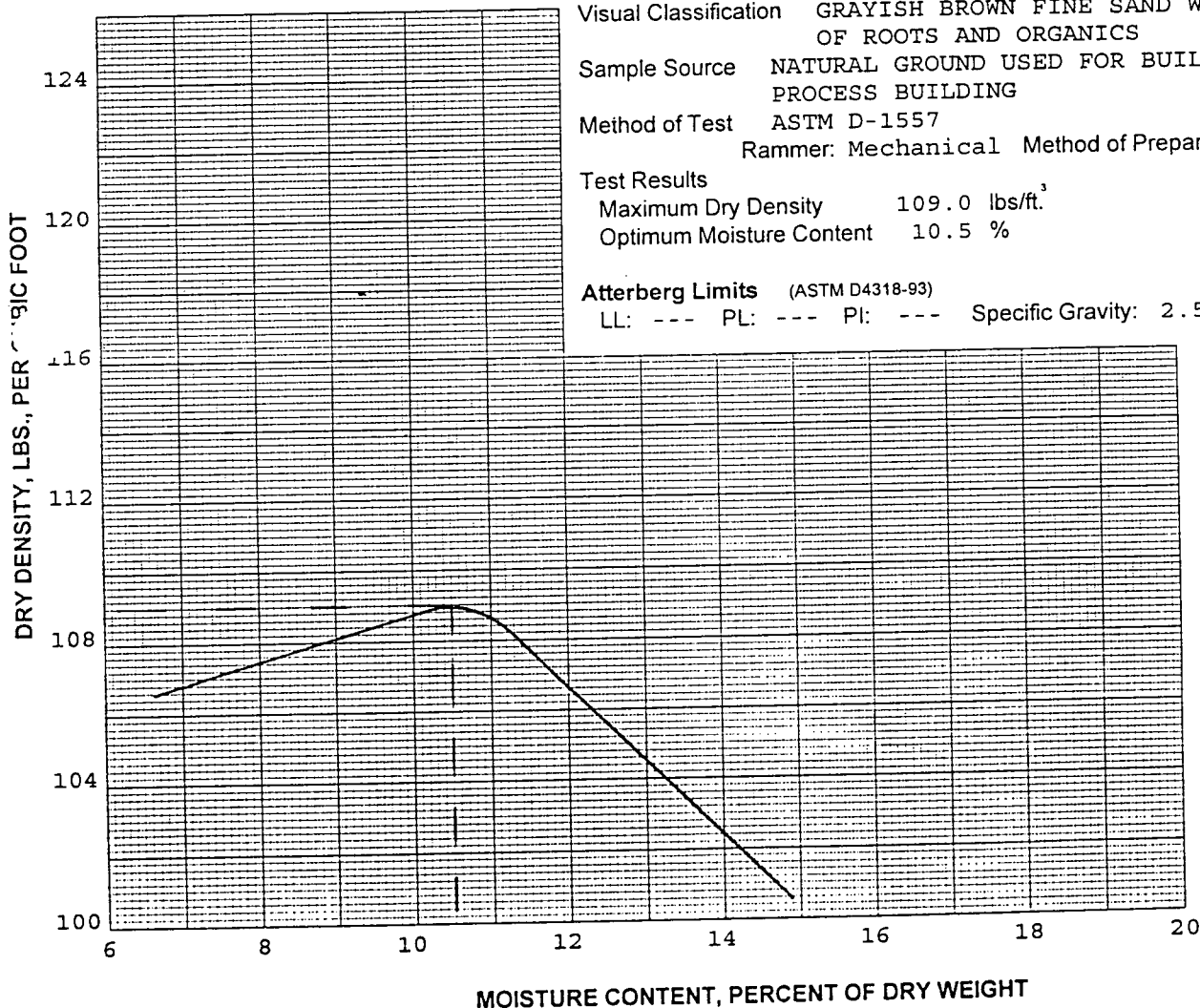
DATE: July 09, 1996

OUR REPORT NO.: 390-60054-3

### TEST DATA

Visual Classification GRAYISH BROWN FINE SAND WITH TRACE  
OF ROOTS AND ORGANICS  
Sample Source NATURAL GROUND USED FOR BUILDING PAD  
PROCESS BUILDING  
Method of Test ASTM D-1557  
Rammer: Mechanical Method of Preparation: Moist  
Test Results  
Maximum Dry Density 109.0 lbs./ft.<sup>3</sup>  
Optimum Moisture Content 10.5 %  
Atterberg Limits (ASTM D4318-93)  
LL: --- PL: --- PI: --- Specific Gravity: 2.59 (estimate)

Grain Size Analysis  
(ASTM C136-93 AND/OR C117-90)  
Sieve Size Percent  
Passing



REMARKS:

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

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*Information To Build On*

## REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: July 09, 1996

OUR REPORT NO.: 390-60054-4

### TEST DATA

Visual Classification BROWN FINE SAND WITH A TRACE OF  
ROOTS

Sample Source STORAGE TANK PAD - NATURAL GROUND

Method of Test ASTM D-1557

Rammer: Mechanical Method of Preparation: Moist

#### Test Results

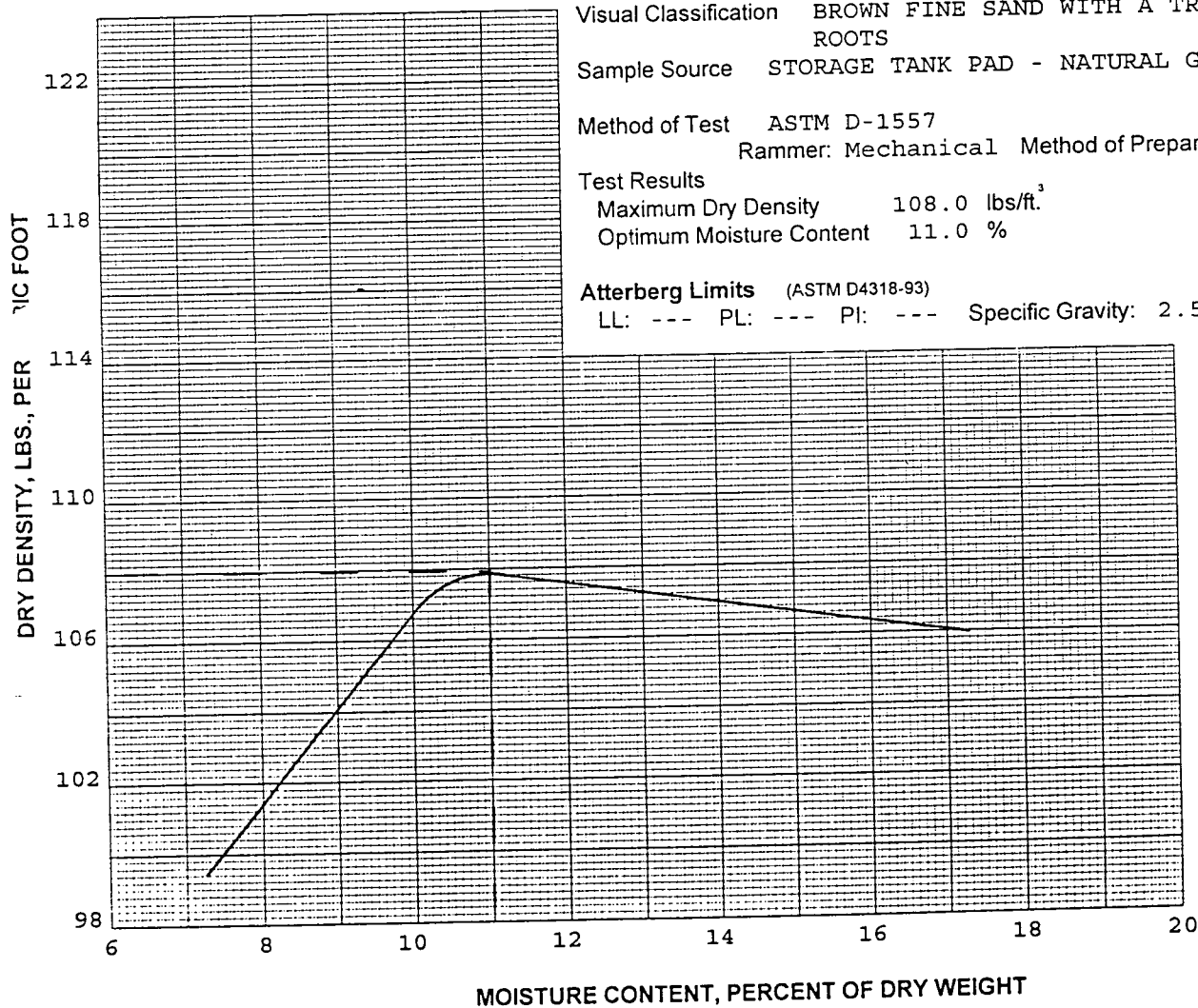
Maximum Dry Density 108.0 lbs/ft.<sup>3</sup>

Optimum Moisture Content 11.0 %

Atterberg Limits (ASTM D4318-93)

LL: --- PL: --- PI: --- Specific Gravity: 2.58 (estimate)

**Grain Size Analysis**  
(ASTM C136-93 AND/OR C117-90)  
Sieve Size Percent Passing



REMARKS:

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF FIELD COMPACTION TESTS

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: July 09, 1996

OUR REPORT NO.: 390-60054-1

TEST DATA: (4) BROWN FINE SAND WITH A TRACE OF ROOTS OPT. MOIST. = 11.0%

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY *	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec.	95% Min
1	12"	4' BEG	4	108.0	3.6	112.0	108.1	100.1	6 - A	
2	12"	4' BEG	4	108.0	2.9	112.0	108.8	100.7	6 - A	
3	12"	1' AEG	3	109.0	9.4	116.9	106.9	98.1	6 - A	
4	12"	2' AEG	3	109.0	6.9	114.9	107.5	98.6	6 - A	
5	12"	3' AEG	3	109.0	6.7	115.2	108.0	99.1	6 - A	

### TEST LOCATION:

1	5' north of center of proposed tank
2	5' south of the northeast side of proposed tank
3	15' north, 10' east of the southwest corner of bldg pad (process bldg.)
4	10' north, 8' east of the southwest corner of bldg. pad (process bldg.)
5	5' north, 3' east of the southwest corner of bldg. pad (process bldg.)

NOTES: TESTS PERFORMED PER ASTM D2922-91 & ASTM D3017-88(93) \*COMMENTS: 1. FILL MATERIAL  
DENSITIES SHOWN: Lbs. per cubic foot 2. BACKFILL  
WATER CONTENT: Percent of dry weight 3. BASE COURSE  
PERCENT COMPACTION: Based on maximum dry 4. SUBBASE  
density obtained on sample indicated by 5. SOIL CEMENT  
soil ID number. 6. OTHER

\* (4) ASTM D-1557

TEST INSTRUMENT: TROXLER, 16926

REMARKS: PSI DID NOT MONITOR THE FILL PLACEMENT.

BEG - Below Existing Grade

AEG = Above Existing Grade

TECHNICIAN: B. SMITH

STANDARD COUNT M: 600 D: 2980

ADJUSTMENT DATA M: D:

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 04, 1996

REVISION #3  
OUR REPORT NO.: 390-60054-15

PAGE 1 OF 2

### FIELD DATA:

LOCATION OF PLACEMENT 20' SOUTH AND 20' EAST OF THE NORTHWEST CORNER OF SLAB

DATE PLACED	November 04, 1996	SUPPLIER	FLORIDA MINING
TIME	08:45 am	DELIVERY TICKET NO./TRUCK NO.	734926
SLUMP, IN.	6 1/2	MIX NUMBER AND PROPORTIONS	10055020/ 5000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	69	WATER	---
CONCRETE TEMPERATURE, °F	71	FINE AGGREGATE	---
DATE RECEIVED IN LAB	November 05, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI	ADMIXTURE	---
MIX DATA SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP: C143-90a; AIR CONTENT: C231-91b; TEMPERATURE: C1064-86(93);

### COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	3	3	11/07/96	106000	6.00	28.27	3750	Cone & Split
B		7	11/11/96	109500	6.02	28.46	3850	Cone & Shear
C		28	12/02/96	167500	6.01	28.37	5900	Cone
D		H	HOLD					

SPECIFICATIONS 28 5000

REMARKS: Cylinders made by PSI representative Cylinders picked up by PSI representative Test results comply with applicable specifications.  
Cylinders made by Architect's or Contractor's representative Cylinders delivered to PSI laboratory Test results do not comply with applicable specifications

CC PC, CAMP DRESSER MCKEE  
HARTON-SMITH

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT  
REPORTS MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 18, 1996

REVISION #1  
OUR REPORT NO.: 390-60054-24

### FIELD DATA:

LOCATION OF PLACEMENT (EIGHT BUILDING SLABS) CHEMICAL ROOM, LEACHATE, THREE ELECTRICAL PANELS,  
TWO SILENCERS AND ONE PIER

DATE PLACED	November 18, 1996	SUPPLIER	FLORIDA MINING
TIME	10:55 am	DELIVERY TICKET NO./TRUCK NO.	739219
SLUMP, IN.	5	MIX NUMBER AND PROPORTIONS	10055020/ 4000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	72	WATER	---
CONCRETE TEMPERATURE, °F	74	FINE AGGREGATE	---
DATE RECEIVED IN LAB	November 19, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI\B. SMITH	ADMIXTURE	---
MATERIAL SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED. SLUMP: C143-60a; AIR CONTENT: C231-91b; TEMPERATURE: C1064-85(93)

### COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	6	4	11/22/96	99500	6.01	28.37	3510	Cone & Split
B		28	12/16/96					
C		28	12/16/96					
D		H	HOLD					

SPECIFICATIONS

28

4000

### REMARKS:

X

Cylinders made by PSI representative.

X

Cylinders picked up by PSI representative

Test results comply with applicable specifications

Cylinders made by Architect's or Contractor's representative

Cylinders delivered to PSI laboratory

Test results do not comply with applicable specifications

TECHNICIAN: B. SMITH

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

Respectfully submitted,  
Professional Service Industries, Inc.



**Environmental  
Geotechnical  
Construction**  
Consulting • Engineering • Testing

## DAILY FIELD REPORT

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: December 02, 1996

OUR REPORT NO.: 390-60054-25

WEATHER: CLEAR - COOL

TEMPERATURE RANGE: --- TO: ---

INSPECTOR: K. KEEGAN

### TYPE OF INSPECTION BEING PERFORMED

☐ SOILS

☒ CONCRETE

☐ FOUNDATIONS

☐ BATCH PLANT

☐ CONTROLLED FILL (COMPACTION)

☐ PLACEMENT (JOB SITE)

☒ CYLINDER PICK UP

☐ ASPHALT

☐ OTHER

☐ BATCH PLANT

☐ PLACEMENT (JOB SITE)

### BRIEF RESUME OF WORK ACCOMPLISHED THIS DATE:

As requested, a representative of our firm arrived on-site to pick up concrete cylinders. The cylinders were returned to our laboratory for compressive strength testing.

Respectfully submitted,  
Professional Service Industries, Inc.

CC C, CAMP DRESSER MCKEE  
WHARTON-SMITH

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 18, 1996

REVISION #2  
OUR REPORT NO.: 390-60054-24

### FIELD DATA:

LOCATION OF PLACEMENT (EIGHT BUILDING SLABS) CHEMICAL ROOM, LEACHATE, THREE ELECTRICAL PANELS,  
TWO SILENCERS AND ONE PIER

DATE PLACED November 18, 1996  
TIME 10:55 am  
SLUMP, IN. 5  
AIR CONTENT, % ---  
AIR TEMPERATURE, °F 72  
CONCRETE TEMPERATURE, °F 74  
DATE RECEIVED IN LAB November 19, 1996  
FIELD DATA SUBMITTED BY PSI/B. SMITH  
DATA SUBMITTED BY SUPPLIER

SUPPLIER FLORIDA MINING  
DELIVERY TICKET NO./TRUCK NO. 739219  
MIX NUMBER AND PROPORTIONS 10055020/ 4000 psi  
CEMENT ---  
WATER ---  
FINE AGGREGATE ---  
COARSE AGGREGATE ---  
ADMIXTURE ---

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP: C143-90a, AIR CONTENT: C231-91b, TEMPERATURE: C1064-86(93)

### COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	6	4	11/22/96	99500	6.01	28.37	3510	Cone & Split
B		28	12/16/96	120500	6.01	28.37	4250	Cone
C		28	12/16/96	115000	6.01	28.37	4050	Cone
D		H	HOLD					

SPECIFICATIONS

28

4000

### REMARKS:

X Cylinders made by PSI representative.

Cylinders made by Architect's or Contractor's representative.

X Cylinders picked up by PSI representative.

Cylinders delivered to PSI laboratory

X Test results comply with applicable specifications.

Test results do not comply with applicable specifications.

TECHNICIAN: B. SMITH

PC: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS PROJECT: LEACHATE STORAGE TANK & TREATMENT FACILITY  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

DATE: October 11, 1996 REVISION #2  
OUR REPORT NO.: 390-60054-12

### FIELD DATA:

LOCATION OF PLACEMENT TOWER - EVAPORATOR PAD : 15' WEST OF THE NORTHEAST CORNER

DATE PLACED	October 11, 1996	SUPPLIER	FLORIDA MINING
TIME	09:00 am	DELIVERY TICKET NO./TRUCK NO.	728205
SLUMP, IN.	4	MIX NUMBER AND PROPORTIONS	10055020/ 4000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	66	WATER	---
CONCRETE TEMPERATURE, °F	65	FINE AGGREGATE	---
DATE RECEIVED IN LAB	October 14, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI\K. KEEGAN	ADMIXTURE	---
MIX DATA SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP: C143-90a; AIR CONTENT: C231-91b; TEMPERATURE: C1064-86(93)

### COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	2	7	10/18/96	137500	6.02	28.46	4830	Cone
B		28	11/08/96	168500	6.01	28.37	5940	Cone
C		28	11/08/96	162500	6.01	28.37	5730	Cone
D		H	HOLD					
SPECIFICATIONS		28					4000	

REMARKS: ☒ Cylinders made by PSI representative. ☒ Cylinders picked up by PSI representative. ☒ Test results comply with applicable specifications.  
☐ Cylinders made by Architect's or Contractor's representative. ☐ Cylinders delivered to PSI laboratory. ☐ Test results do not comply with applicable specifications.

TECHNICIAN: K. KEEGAN

Respectfully submitted,  
Professional Service Industries, Inc.

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

DAILY FIELD REPORT

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 04, 1996 OUR REPORT NO.: 390-60054-14

WEATHER: CLEAR

TEMPERATURE RANGE: --- TO: ---

INSPECTOR: K. KEEGAN

TYPE OF INSPECTION BEING PERFORMED

\_\_\_ SOILS

  X   CONCRETE

\_\_\_ FOUNDATIONS

\_\_\_ BATCH PLANT

\_\_\_ CONTROLLED FILL (COMPACTION)

\_\_\_ PLACEMENT (JOB SITE)

  X   STAND-BY TIME

\_\_\_ ASPHALT

\_\_\_ OTHER

\_\_\_ BATCH PLANT

\_\_\_ PLACEMENT (JOB SITE)

BRIEF RESUME OF WORK ACCOMPLISHED THIS DATE:

As requested, a representative of our firm arrived on-site at 7:30 a.m. to perform concrete testing. A total of 1.5 hours of stand-by time was incurred due to concrete delays during placement and performing tests at the required cubic yard intervals.

stand-by time : 1.5 hours                      total time : 4.5 hours

Respectfully submitted,  
Professional Service Industries, Inc.

cc: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

REVISION #1

DATE: November 04, 1996

OUR REPORT NO.: 390-60054-15

PAGE 1 OF 2

### FIELD DATA:

LOCATION OF PLACEMENT 20' SOUTH AND 20' EAST OF THE NORTHWEST CORNER OF SLAB

DATE PLACED	November 04, 1996	SUPPLIER	FLORIDA MINING
TIME	08:45 am	DELIVERY TICKET NO./TRUCK NO.	734926
SLUMP, IN.	6 1/2	MIX NUMBER AND PROPORTIONS	10055020
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	69	WATER	---
CONCRETE TEMPERATURE, °F	71	FINE AGGREGATE	---
DATE RECEIVED IN LAB	November 05, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI	ADMIXTURE	---
MI TA SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP: C143-90a; AIR CONTENT: C231-91b; TEMPERATURE: C1064-86(93)

### COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	3	3	11/07/96	106000	6.00	28.27	3750	Cone & Split
B		7	11/11/96	109500	6.02	28.46	3850	Cone
C		28	12/02/96					
D		H	HOLD					

### SPECIFICATIONS

### REMARKS:

Cylinders made by PSI representative.

Cylinders picked up by PSI representative.

Test results comply with applicable specifications.

Cylinders made by Architect's or Contractor's representative.

Cylinders delivered to PSI laboratory.

Test results do not comply with applicable specifications.

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

Respectfully submitted,  
Professional Service Industries, Inc.

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

REVISION #1

DATE: November 04, 1996

OUR REPORT NO.: 390-60054-15

PAGE 2 OF 2

### FIELD DATA:

LOCATION OF PLACEMENT 15' NORTH AND 10' WEST OF THE SOUTHEAST CORNER OF SLAB

DATE PLACED	November 04, 1996	SUPPLIER	FLORIDA MINING
TIME	10:20 am	DELIVERY TICKET NO./TRUCK NO.	734930
SLUMP, IN.	7	MIX NUMBER AND PROPORTIONS	10055020/ 5000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	71	WATER	---
CONCRETE TEMPERATURE, °F	73	FINE AGGREGATE	---
DATE RECEIVED IN LAB	November 05, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI\K. KEEGAN	ADMIXTURE	---
MATERIAL SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP, C143-90a; AIR CONTENT, C231-91b; TEMPERATURE, C1064-86(93)

### COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	4	3	11/07/96	119000	6.00	28.27	4210	Shear
B		7	11/11/96	130000	6.02	28.46	4570	Cone
C		28	12/02/96					
D		H	HOLD					
SPECIFICATIONS				28	5000			

REMARKS: ☒ Cylinders made by PSI representative. ☒ Cylinders picked up by PSI representative. Test results comply with applicable specifications.

☐ Cylinders made by Architect's or Contractor's representative. ☐ Cylinders delivered to PSI laboratory. Test results do not comply with applicable specifications.

TECHNICIAN: K. KEEGAN

Respectfully submitted,  
Professional Service Industries, Inc.

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

DAILY FIELD REPORT

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 05, 1996

OUR REPORT NO.: 390-60054-16

WEATHER: CLEAR

TEMPERATURE RANGE: --- TO: ---

INSPECTOR: K. KEEGAN

TYPE OF INSPECTION BEING PERFORMED

\_\_\_ SOILS

X  CONCRETE

\_\_\_ FOUNDATIONS

\_\_\_ BATCH PLANT

\_\_\_ CONTROLLED FILL (COMPACTION)

\_\_\_ PLACEMENT (JOB SITE)

X  CYLINDER PICK UP

\_\_\_ ASPHALT

\_\_\_ OTHER

\_\_\_ BATCH PLANT

\_\_\_ PLACEMENT (JOB SITE)

BRIEF RESUME OF WORK ACCOMPLISHED THIS DATE:

As requested, a representative of our firm was on-site to pick up concrete cylinders cast the previous day. The cylinders were returned to our laboratory for compressive strenght testing.

Respectfully submitted,  
Professional Service Industries, Inc.

CC: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 05, 1996 OUR REPORT NO.: 390-60054-17

FIELD DATA:  
LOCATION OF PLACEMENT CYLINDERS CAST BY CONTRACTOR

DATE PLACED	November 05, 1996	SUPPLIER	FLORIDA MINING
TIME	---	DELIVERY TICKET NO./TRUCK NO.	UNKNOWN
SLUMP, IN.	---	MIX NUMBER AND PROPORTIONS	UNKNOWN/ 4000 psi
AIR CONTENT, %	---	CEMENT	UNKNOWN
AIR TEMPERATURE, °F	---	WATER	UNKNOWN
CONCRETE TEMPERATURE, °F	---	FINE AGGREGATE	UNKNOWN
DATE RECEIVED IN LAB	November 06, 1996	COARSE AGGREGATE	UNKNOWN
FIELD DATA SUBMITTED BY	CONTRACTOR	ADMIXTURE	UNKNOWN
MATERIAL SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP: C143-90a; AIR CONTENT: C231-91b; TEMPERATURE: C1064-86(93)

### COMPRESSION TEST RESULTS

ASTM C39-94

ASTM C55-94								
LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	5	7	11/12/96	84000	6.01	28.37	2960	Cone & Shear
B		28	12/03/96					
C		28	12/03/96					
D		H	HOLD					
SPECIFICATIONS		28	4000					

REMARKS: ☐ Cylinders made by PSI representative. ☒ Cylinders picked up by PSI representative. ☐ Test results comply with applicable specifications.

☒ Cylinders made by Architect's or Contractor's representative. ☐ Cylinders delivered to PSI laboratory. ☐ Test results do not comply with applicable specifications.

TECHNICIAN: CONTRACTOR

Respectfully submitted,  
Professional Service Industries, Inc.

: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*



**Environmental  
Geotechnical  
Construction**  
Consulting • Engineering • Testing

## DAILY FIELD REPORT

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: November 06, 1996

OUR REPORT NO.: 390-60054-18

WEATHER: CLOUDY

TEMPERATURE RANGE: --- TO: ---

INSPECTOR: K. KEEGAN

### TYPE OF INSPECTION BEING PERFORMED

☐ SOILS

☒ CONCRETE

☐ FOUNDATIONS

☐ BATCH PLANT

☐ CONTROLLED FILL (COMPACTION)

☐ PLACEMENT (JOB SITE)

☒ CYLINDER PICK UP

☐ ASPHALT

☐ OTHER

☐ BATCH PLANT

☐ PLACEMENT (JOB SITE)

### BRIEF RESUME OF WORK ACCOMPLISHED THIS DATE:

As requested, a representative of our firm was on-site to pick up concrete cylinders. The cylinders were returned to our laboratory for compressive strength testing.

Respectfully submitted,  
Professional Service Industries, Inc.

cc. PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK & TREATMENT FACILITY

DATE: October 01, 1996

REVISION #2  
OUR REPORT NO.: 390-60054-11

### FIELD DATA:

LOCATION OF PLACEMENT 15' SOUTH AND 20' WEST OF THE NORTHEAST CORNER OF BAG HOUSE/SPRAIN CHAMBER

DATE PLACED	October 01, 1996	SUPPLIER	FLORIDA MINING
TIME	12:15 pm	DELIVERY TICKET NO./TRUCK NO.	725908
SLUMP, IN.	6	MIX NUMBER AND PROPORTIONS	10055020/ 4000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	88	WATER	---
CONCRETE TEMPERATURE, °F	90	FINE AGGREGATE	---
DATE RECEIVED IN LAB	October 02, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI\K. KEEGAN	ADMIXTURE	---
LABORATORY DATA SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP, C143-90a; AIR CONTENT, C231-91b; TEMPERATURE, C1064-86(93).

### COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	1	7	10/08/96	111000	6.00	28.27	3930	Cone & Shear
B		28	10/29/96	133000	6.02	28.46	4670	Cone & Shear
C		28	10/29/96	143000	6.02	28.46	5020	Cone & Shear
D		H	HOLD					

### SPECIFICATIONS

28

4000

REMARKS: X Cylinders made by PSI representative. X Cylinders picked up by PSI representative. X Test results comply with applicable specifications.

Cylinders made by Architect's or Contractor's representative. Cylinders delivered to PSI laboratory. Test results do not comply with applicable specifications.

TECHNICIAN: K. KEEGAN

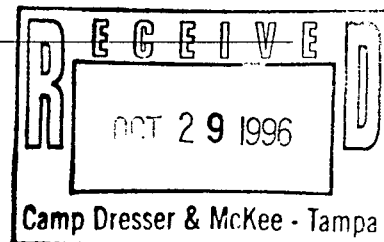
Respectfully submitted,  
Professional Service Industries, Inc.

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT. REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*





# REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE

NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

REVISION #1

DATE: October 11, 1996

OUR REPORT NO.: 390-60054-12

## FIELD DATA:

LOCATION OF PLACEMENT TOWER - EVAPORATOR PAD : 15' WEST OF THE NORTHEAST CORNER

DATE PLACED	October 11, 1996	SUPPLIER	FLORIDA MINING
TIME	09:00 am	DELIVERY TICKET NO./TRUCK NO.	728205
SLUMP, IN.	4	MIX NUMBER AND PROPORTIONS	10055020/ 4000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	66	WATER	---
CONCRETE TEMPERATURE, °F	65	FINE AGGREGATE	---
DATE RECEIVED IN LAB	October 14, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI\K. KEEGAN	ADMIXTURE	---
MIX DATA SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP, C143-90a; AIR CONTENT, C231-91b; TEMPERATURE, C1064-86(93).

## COMPRESSION TEST RESULTS

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A	2	7	10/18/96	137500	6.02	28.46	4830	Cone
B		28	11/08/96					
C		28	11/08/96					
D		H	HOLD					
SPECIFICATIONS		28	4000					

REMARKS: ☒ Cylinders made by PSI representative. ☒ Cylinders picked up by PSI representative. Test results comply with applicable specifications.

☐ Cylinders made by Architect's or Contractor's representative. ☐ Cylinders delivered to PSI laboratory. Test results do not comply with applicable specifications.

TECHNICIAN: K. KEEGAN

Respectfully submitted,  
Professional Service Industries, Inc.

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*

DAILY FIELD REPORT

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK &  
TREATMENT FACILITY

DATE: October 14, 1996

OUR REPORT NO.: 390-60054-13

WEATHER: CLEAR

TEMPERATURE RANGE: --- TO: ---

INSPECTOR: K. KEEGAN

TYPE OF INSPECTION BEING PERFORMED

\_\_\_ SOILS

X  CONCRETE

\_\_\_ FOUNDATIONS

\_\_\_ BATCH PLANT

\_\_\_ CONTROLLED FILL (COMPACTION)

\_\_\_ PLACEMENT (JOB SITE)

X  CYLINDER PICK UP

\_\_\_ ASPHALT

\_\_\_ OTHER

\_\_\_ BATCH PLANT

\_\_\_ PLACEMENT (JOB SITE)

BRIEF RESUME OF WORK ACCOMPLISHED THIS DATE:

As requested, a representative of our firm was on-site to pick up concrete cylinders. The cylinders were returned to our laboratory for compressive strength testing.

Respectfully submitted,  
Professional Service Industries, Inc.

CC: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK & TREATMENT FACILITY

DATE: October 01, 1996

REVISION #1  
OUR REPORT NO.: 390-60054-11

FIELD DATA:  
LOCATION OF PLACEMENT 15' SOUTH AND 20' WEST OF THE NORTHEAST CORNER OF BAG HOUSE/SPRAIN CHAMBER

DATE PLACED	October 01, 1996	SUPPLIER	FLORIDA MINING
TIME	12:15 pm	DELIVERY TICKET NO./TRUCK NO.	725908
SLUMP, IN.	6	MIX NUMBER AND PROPORTIONS	10055020/ 4000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	88	WATER	---
CONCRETE TEMPERATURE, °F	90	FINE AGGREGATE	---
DATE RECEIVED IN LAB	October 02, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI\K. KEEGAN	ADMIXTURE	---
DATA SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS UNLESS OTHERWISE INDICATED: SLUMP: C143-90a; AIR CONTENT: C231-91b; TEMPERATURE: C1064-86(93)

### COMPRESSION TEST RESULTS

ASTM C39-94

ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A B C D	1	7 28 28 H	10/08/96 10/29/96 10/29/96 HOLD	111000	6.00	28.27	3930	Cone & Shear
SPECIFICATIONS		28					4000	

REMARKS: ☒ Cylinders made by PSI representative. ☒ Cylinders picked up by PSI representative. ☐ Test results comply with applicable specifications.

☐ Cylinders made by Architect's or Contractor's representative. ☐ Cylinders delivered to PSI laboratory. ☐ Test results do not comply with applicable specifications.

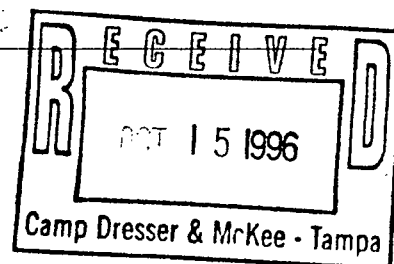
TECHNICIAN: K. KEEGAN

Respectfully submitted,  
Professional Service Industries, Inc.

TO: PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*



## REPORT OF CONCRETE COMPRESSION TEST

TESTED FOR: PC BOARD OF COMMISSIONERS  
8919 GOVERNMENT DRIVE  
NEW PORT RICHEY, FL 34654

PROJECT: LEACHATE STORAGE TANK & TREATMENT FACILITY

DATE: October 01, 1996 OUR REPORT NO.: 390-60054-11

FIELD DATA:  
LOCATION OF PLACEMENT 15' SOUTH AND 20' WEST OF THE NORTHEAST CORNER OF BAG HOUSE/SPRAIN CHAMBER

DATE PLACED	October 01, 1996	SUPPLIER	FLORIDA MINING
TIME	12:15 pm	DELIVERY TICKET NO./TRUCK NO.	725908
SLUMP, IN.	6	MIX NUMBER AND PROPORTIONS	10055020/ 4000 psi
AIR CONTENT, %	---	CEMENT	---
AIR TEMPERATURE, °F	88	WATER	---
CONCRETE TEMPERATURE, °F	90	FINE AGGREGATE	---
DATE RECEIVED IN LAB	October 02, 1996	COARSE AGGREGATE	---
FIELD DATA SUBMITTED BY	PSI/K. KEEGAN	ADMIXTURE	---
MATERIAL SUBMITTED BY	SUPPLIER		

NOTE: APPLICABLE ASTM STANDARDS, UNLESS OTHERWISE INDICATED: SLUMP: C143-90a; AIR CONTENT: C231-91b; TEMPERATURE: C1064-86(93)

### COMPRESSION TEST RESULTS ASTM C39-94

LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	TEST AGE (DAYS)	DATE OF TEST	TOTAL LOAD (LBS.)	CYLINDER DIAMETER (IN.)	CYLINDER AREA (SQ. IN.)	COMPRESSIVE STRENGTH (PSI)	TYPE OF BREAK
A		7	10/08/96					
B		28	10/29/96					
C		28	10/29/96					
D		H	HOLD					
SPECIFICATIONS		28					4000	

REMARKS: ☒ Cylinders made by PSI representative. ☒ Cylinders picked up by PSI representative. Test results comply with applicable specifications.

☐ Cylinders made by Architect's or Contractor's representative. ☐ Cylinders delivered to PSI laboratory. Test results do not comply with applicable specifications.

TECHNICIAN: K. KEEGAN

Respectfully submitted,  
Professional Service Industries, Inc.

PC, CAMP DRESSER MCKEE  
WHARTON-SMITH

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC SAMPLES TESTED AND MAY NOT BE INDICATIVE OF THE ENTIRE CONCRETE PLACEMENT.  
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

*Information To Build On*



**R. DAMAN & ASSOCIATES, INC**  
1406 TECH BLVD.  
TAMPA, FLORIDA 33619  
(813)620-3389

File Number 96-9711



RFH RAN

## COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

TO: THE CROM CORPORATION  
Project Name: PASCO COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY  
Project Location: HWY 39 NORTH AND COUNTY LINE ROAD, PLANTCITY  
Project Contractor: THE CROM CORPORATION  
Concrete Supplier: FLORIDA ROCK

CC:

DATE: 08/28/96

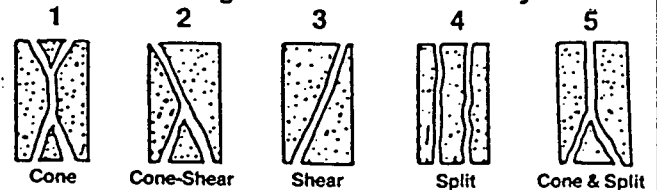
SOS S

SEP - 3 1996

DESIGN DATA	Specified Strength: 4000 p.s.i. @ 28 days		Slump(inches): N/A		Air Content (percent): N/A	
	Mix Type: <input checked="" type="checkbox"/> Normal wt. <input type="checkbox"/> Lightweight <input type="checkbox"/> Mortar Mix <input type="checkbox"/> Gunite <input type="checkbox"/> Grout <input type="checkbox"/> Other CROM 35A-1					
	<input checked="" type="checkbox"/> Transit mixed: <input type="checkbox"/> Pump Mixed <input type="checkbox"/> Other PC #CR35A1					
Field and Lab Data	Date: 08/20/96	Time Concrete Batched: 7:18		Time Concrete Sampled: 8:05		Sampled By: CHRIS KUALII
	Concrete Truck No: 6237	Ticket Number: 326233		Size of Load(C.Y.): 9.0		Weather Conditions: PARTLY CLOUDY
	Water Added At Job Site: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes Gal. To C.Y.					Extra Water Authorized By: N/A
	Slump(inches): 6.0	Air Temperature (°F): 84		Concrete Temperature(°F): 86		Wet Weight (P.C.F.): N/A
	Air Content (%by Vol): 2.25	Molded and Cured* to ASTM C- 31 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				Tested to ASTM C- 39 <input checked="" type="checkbox"/> PAD <input type="checkbox"/> SULFUR
	Location of Concrete Placement: SOUTHWEST QUADRANT OF 2 MILLION GALLON TANK FLOOR					

Set No.	Date Received In Lab	Date Tested	Age (Days)	Test Specimen Size		Total Load Applied (LBS)	Test Strength (PSI)	Type of Fracture	Specimen Weight (Air Dry-Lbs)
				Diameter(in.)	Area (Sq.In.)				
1	08/21/96	08/27/96 09/17/96 09/17/96 09/17/96	7 28 28 SP	6.00	28.27	160,000	5660	3	R/S

REMARKS: \*Concrete Test Specimen Cured in Accordance with ASTM C-31 After Being Received in Laboratory



Florida Registration No. 30254

By WAYNE PANDORF, P.E.

AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL.



**W. DAMAN & ASSOCIATES, INC**  
1406 TECH BLVD.  
TAMPA, FLORIDA 33619  
(813)620-3389

File Number 96-9711



## COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

TO: THE CROM CORPORATION

CC:

DATE: 08/28/96

Project Name: PASCO COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY

Project Location: HWY 39 NORTH AND COUNTY LINE ROAD, PLANTCITY

Project Contractor: THE CROM CORPORATION

Concrete Supplier: FLORIDA ROCK

<b>DESIGN DATA</b>	Specified Strength: 4000 p.s.i. @ 28 days		Slump(inches): 6.0		Air Content (percent): 3-4			
	Mix Type: <input checked="" type="checkbox"/> Normal wt. <input type="checkbox"/> Lightweight <input type="checkbox"/> Mortar Mix <input type="checkbox"/> Gunite <input type="checkbox"/> Grout <input type="checkbox"/> Other CROM 35A-1							
	<input checked="" type="checkbox"/> Transit mixed: <input type="checkbox"/> Pump Mixed <input type="checkbox"/> Other PC #CR35A1							
<b>Field and Lab Data</b>	Date: 08/20/96		Time Concrete Batched: 8:38		Time Concrete Sampled: 9:20		Sampled By: CHRIS KUALII	
	Concrete Truck No: 0696		Ticket Number: 326237		Size of Load(C.Y.): 9.0		Weather Conditions: PARTLY CLOUDY	
	Water Added At Job Site: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes 10 Gal. To 9 C.Y.						Extra Water Authorized By: FLORIDA ROCK REP	
	Slump(inches): 6.0		Air Temperature (°F): 84		Concrete Temperature(°F): 86		Wet Weight (P.C.F.): N/A	
	Air Content (%by Vol): 2.25		Molded and Cured* to ASTM C- 31 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				Tested to ASTM C- 39 <input checked="" type="checkbox"/> PAD <input type="checkbox"/> SULFUR	
	Location of Concrete Placement: SOUTHEAST QUADRANT OF 2 MILLION GALLON TANK FLOOR							

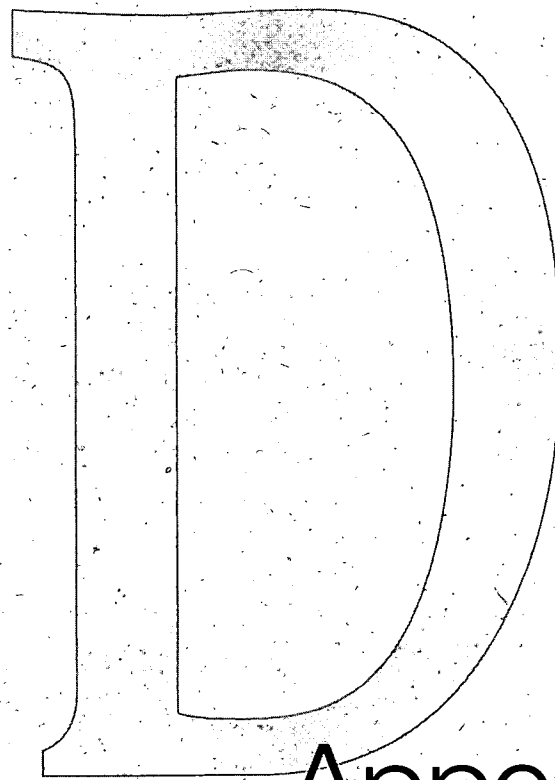
Set No.	Date Received In Lab	Date Tested	Age (Days)	Test Specimen Size		Total Load Applied (LBS)	Test Strength (PSI)	Type of Fracture	Specimen Weight (Air Dry-Lbs)
				Diameter(in.)	Area (Sq.In.)				
2	08/21/96	08/27/96 09/17/96 09/17/96 09/17/96	7 28 28 SP	6.00	28.27	149,000	5270	3	15.5

REMARKS: \*Concrete Test Specimen Cured in Accordance with ASTM C-31 After Being Received in Laboratory

1	2	3	4	5
Cone	Cone-Shear	Shear	Split	Cone & Split

Florida Registration No. 30254

By WAYNE PANDORF, P.E.



# Appendix D

## Appendix D

# System Description and Process Flow Diagrams



3006 Northup Way  
Bellevue, WA 98004-1407

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

*A Division of Ionics, Incorporated*

March 20, 1997  
PAS-L210.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,

Attached please find four (4) copies of Resources Conservation Company's Application for Certification of Resource Recovery Equipment. This application includes those items as required under Chapter 62-704 "Certification of Resource Recovery and Recycling Equipment." If anything is missing or incomplete, please do not hesitate to call us.

Resources Conservation Company (RCC) was hired by Pasco County, Florida to provide a water recovery system to be incorporated into the Pasco County Resource Recovery Plant in Hudson, Florida. The purpose of this equipment is to recover 30,000 gallons of high quality process water which will be used for boiler feed water and cooling tower make up at the facility.

We respectfully submit the attached application for certification on behalf of Resources Conservation Company and Pasco County, Florida. Contact the undersigned at (206) 828-2400 if you have any questions or comments.

Very truly yours,

RESOURCES CONSERVATION COMPANY

Mike Spann  
Project Manager



# Department of Environmental Protection

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

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)

## 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.

- Use the "Item No." column to sequentially number equipment on the list.
- Use the "Item Description" column to provide the name and a brief description of the equipment.
- Use the "Number of Pieces" column to indicate how many of this particular piece of equipment are being certified.
- 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:

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

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.

DEP Form #	62-701.900(5)
Ap. for Prelim. Exam. & Final Exam	
Form Title of Resource Recovery Equipment	
Effective Date	12/23/96
DEP Application No.	(Filled in By DEP)

### 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

\_\_\_\_\_  
Name and Title

Florida Registration No. \_\_\_\_\_

Date \_\_\_\_\_

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)
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	*
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.

- | <u>Drawing No.</u> | <u>Sheet</u> | <u>Title</u>                               |
|--------------------|--------------|--|
| 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

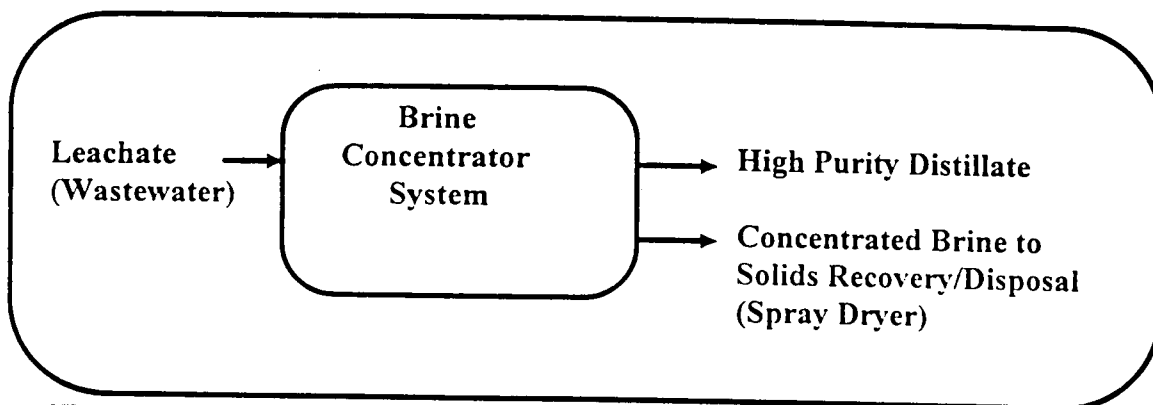
## BRINE CONCENTRATOR & SPRAY DRYER PROCESS & SYSTEM DESCRIPTION

### 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.

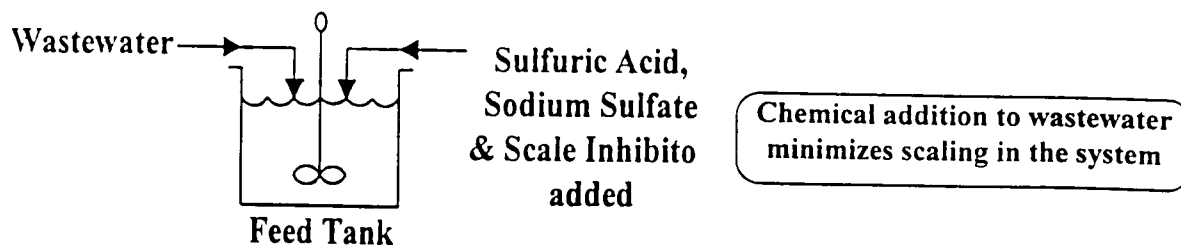


The Brine Concentrator System recovers a high percentage of the incoming wastewater stream as high purity distillate.

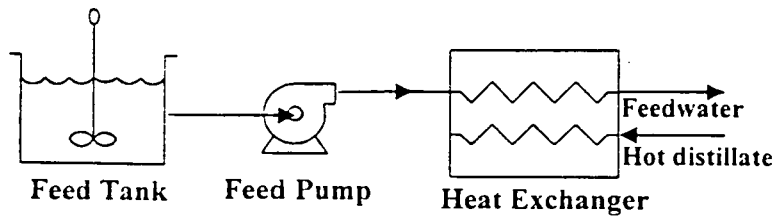
## 2.0

### 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.

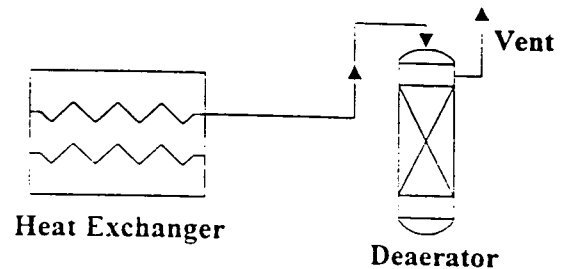


The treated wastewater (feed water) is pumped through a plate and frame Heat Exchanger to heat the feed water to near its boiling point.

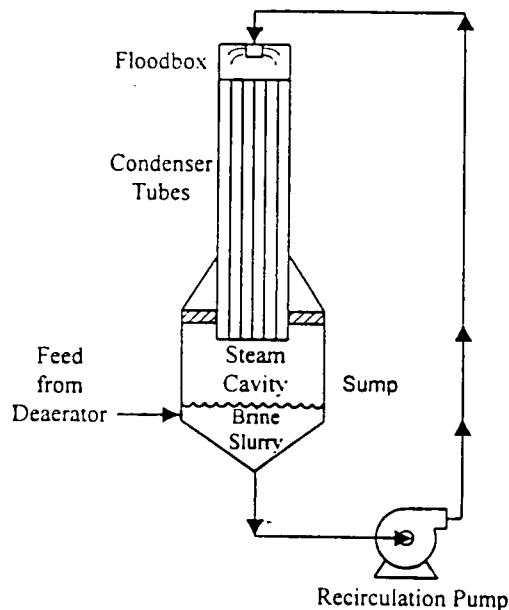


Feed water is heated to aid in the release of undesirable gases

The feed water then enters a Deaerator where noncondensable 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.

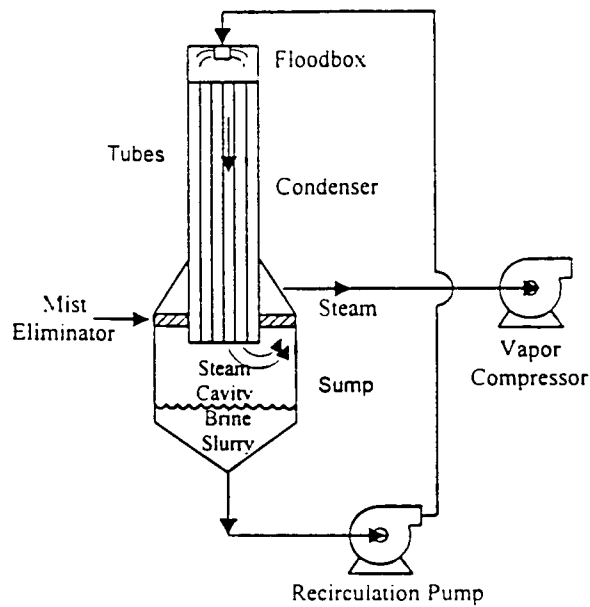


Gases vented to atmosphere



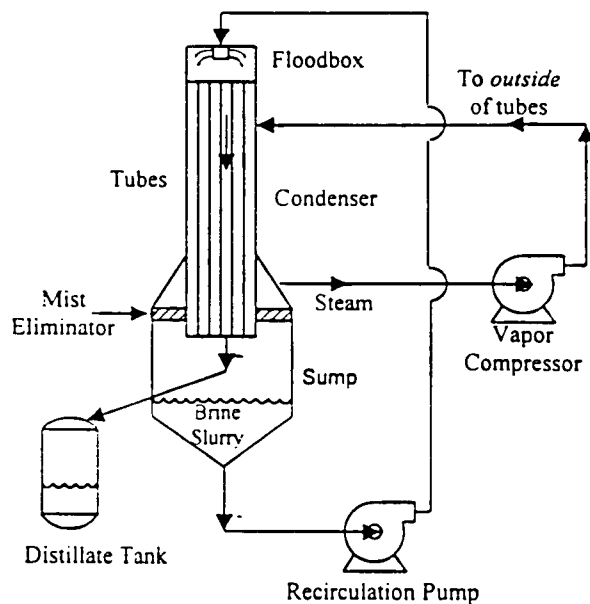
The feed flows by gravity from the bottom of the Deaerator into the Evaporator Sump. Here it mixes with recirculating concentrated brine slurry.

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).

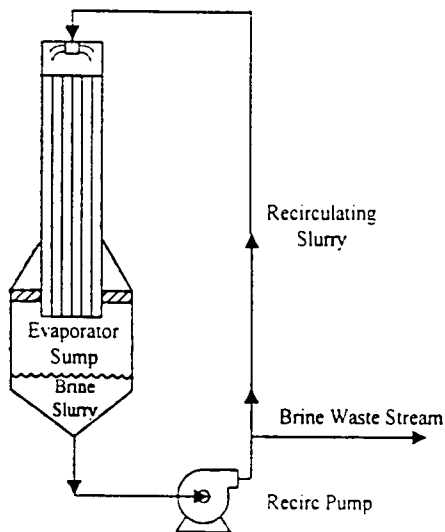


The steam is drawn from the steam cavity through Mist Eliminator pads to the Vapor Compressor. The Mist Eliminator pads trap and remove liquid droplets and entrained solids from the water vapor.

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.



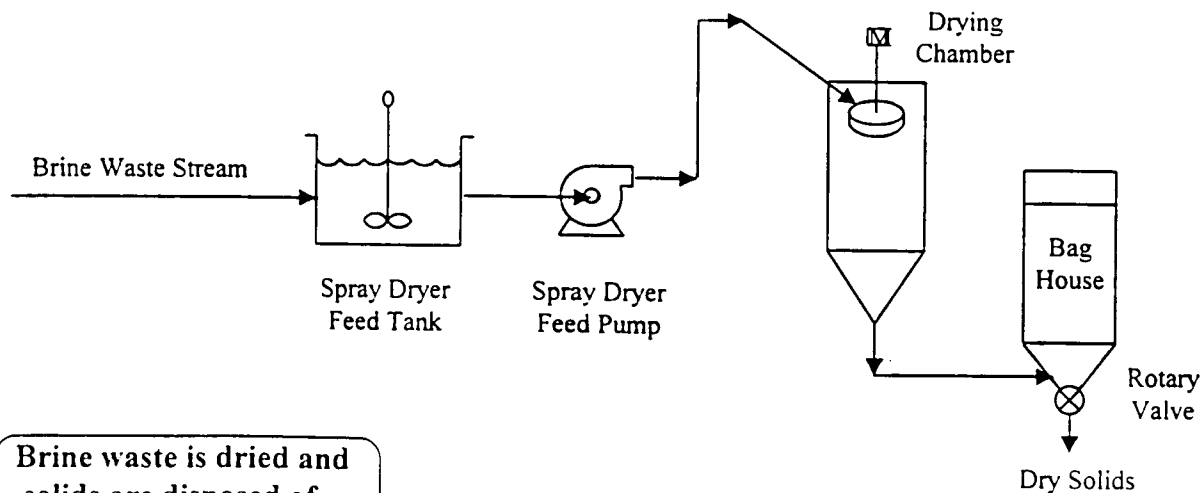
The higher pressure vapor exits the Vapor Compressor and condenses on the **outside** of the Evaporator tubes, transferring its heat to the thin film of brine flowing down the inside of the tubes. The condensate runs down the outside surface of the tubes to the bottom of the Condenser and then flows 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<sub>2</sub> 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 imbalance. 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: Noncondensable Gas Removal**

The Brine Concentrator feed water contains some noncondensable gases and carbonates (converted to CO<sub>2</sub> and oxygen by acid addition) which must be removed before the feed water enters the Evaporator Sump. If the noncondensable 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 noncondensable gases. The excess steam and the removed noncondensable 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 noncondensable 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 is 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 through 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 noncondensable 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)

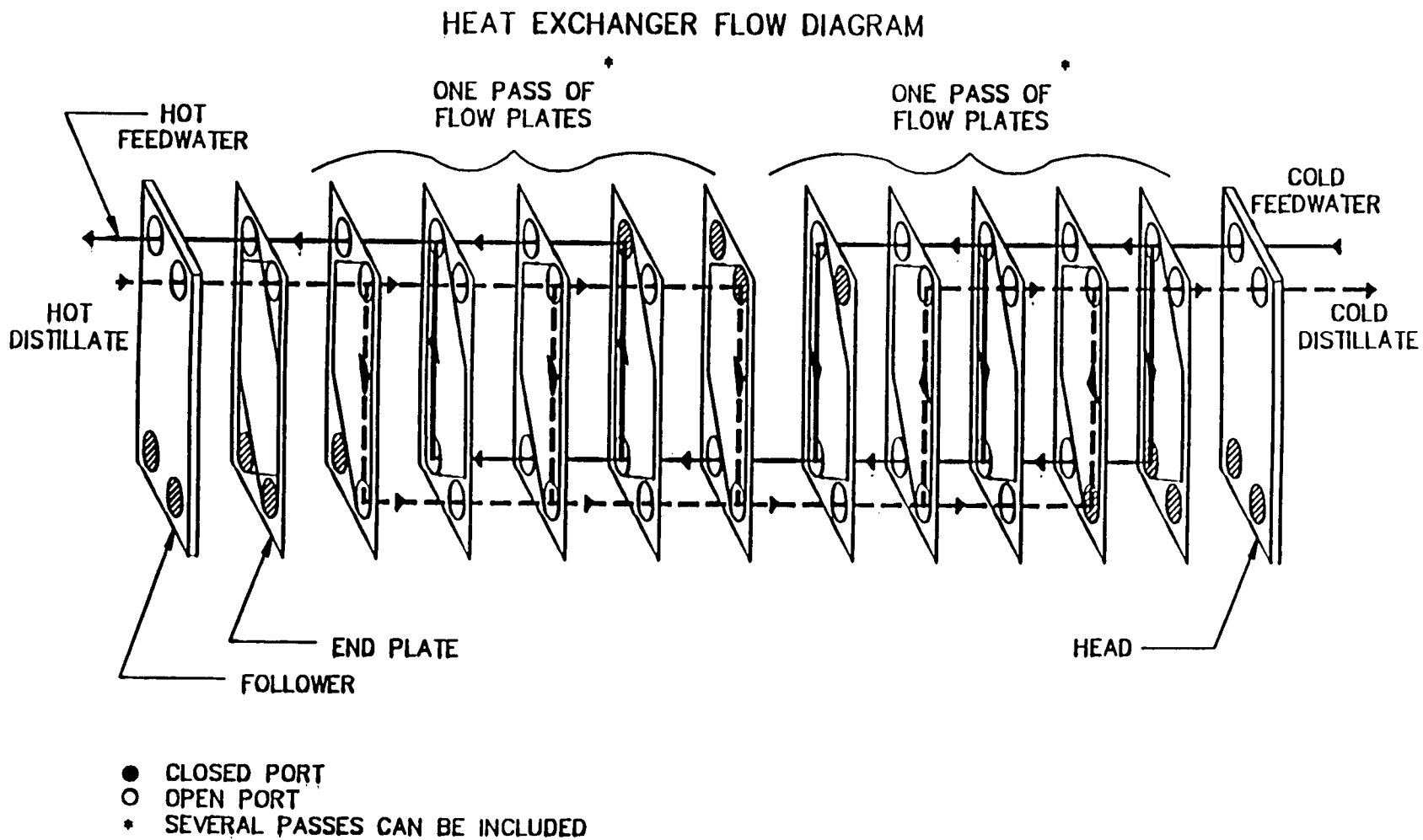
The 8000 gallon Spray Dryer Feed Tank is used during normal operation to temporarily store waste brine until it is fed (via the Spray Dryer Feed Pump) to the Spray Dryer.

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.

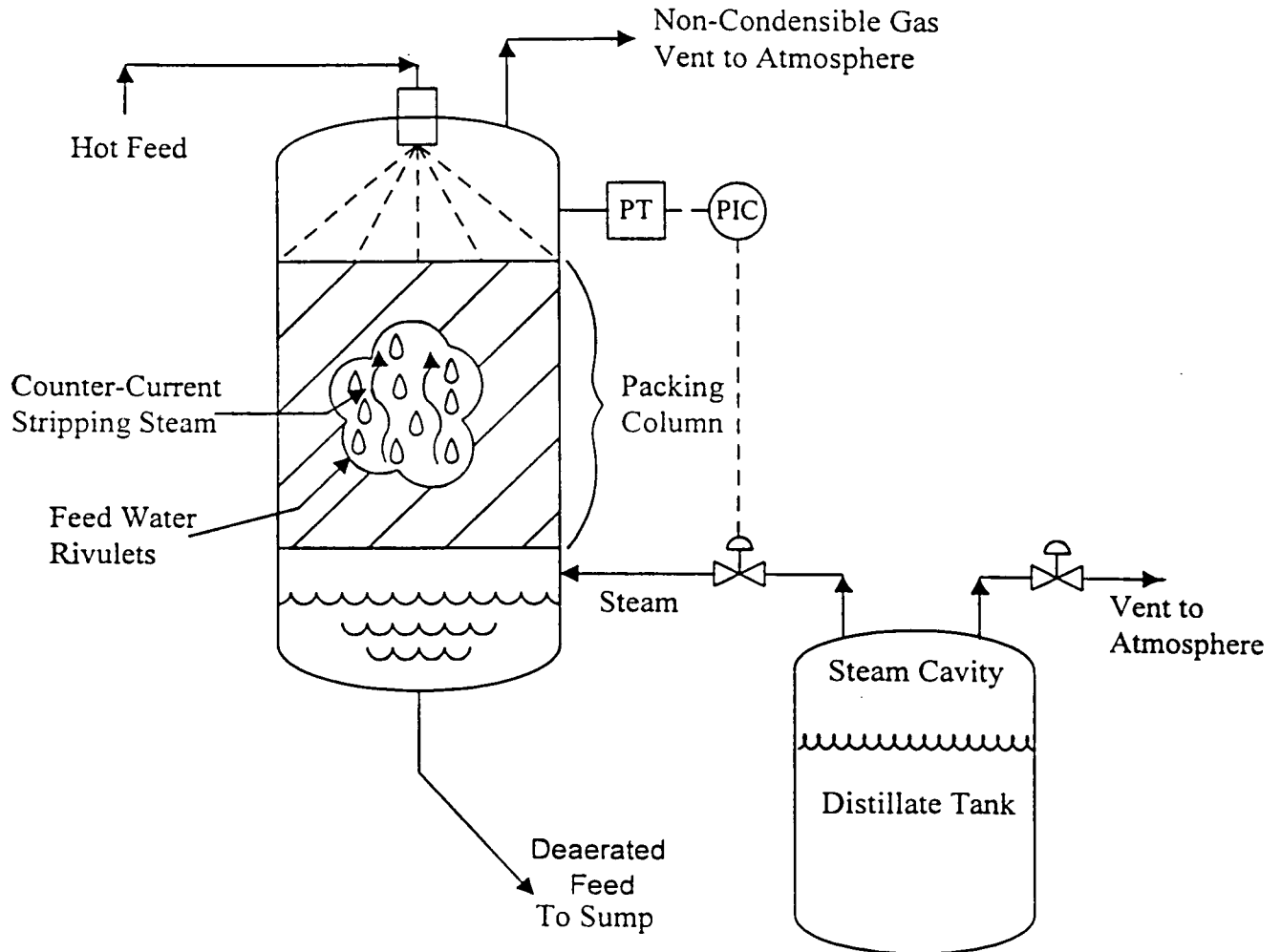
### 3.12 Spray Dryer Unit

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.



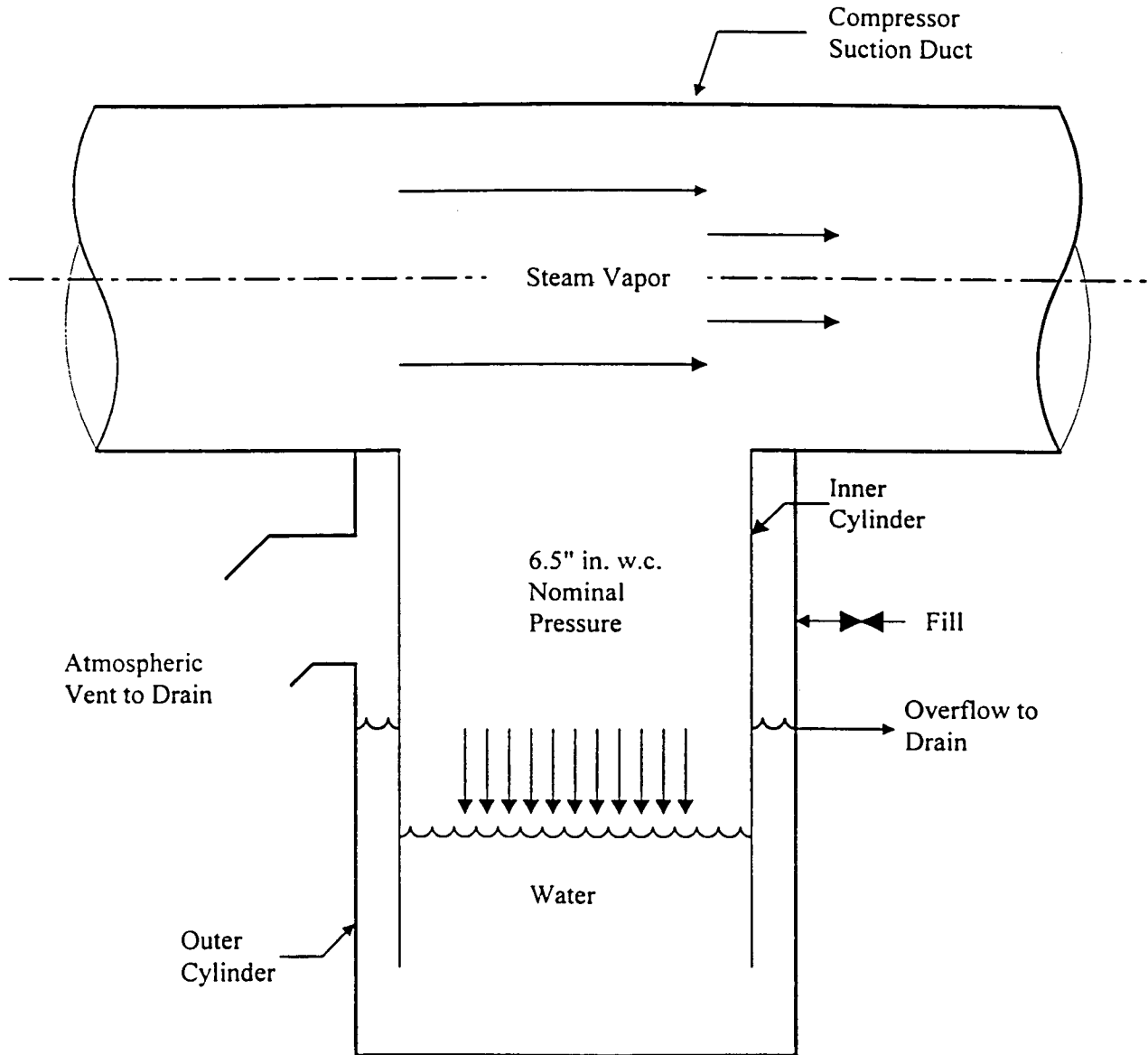
**FIGURE A-1**

FIGURE A-2



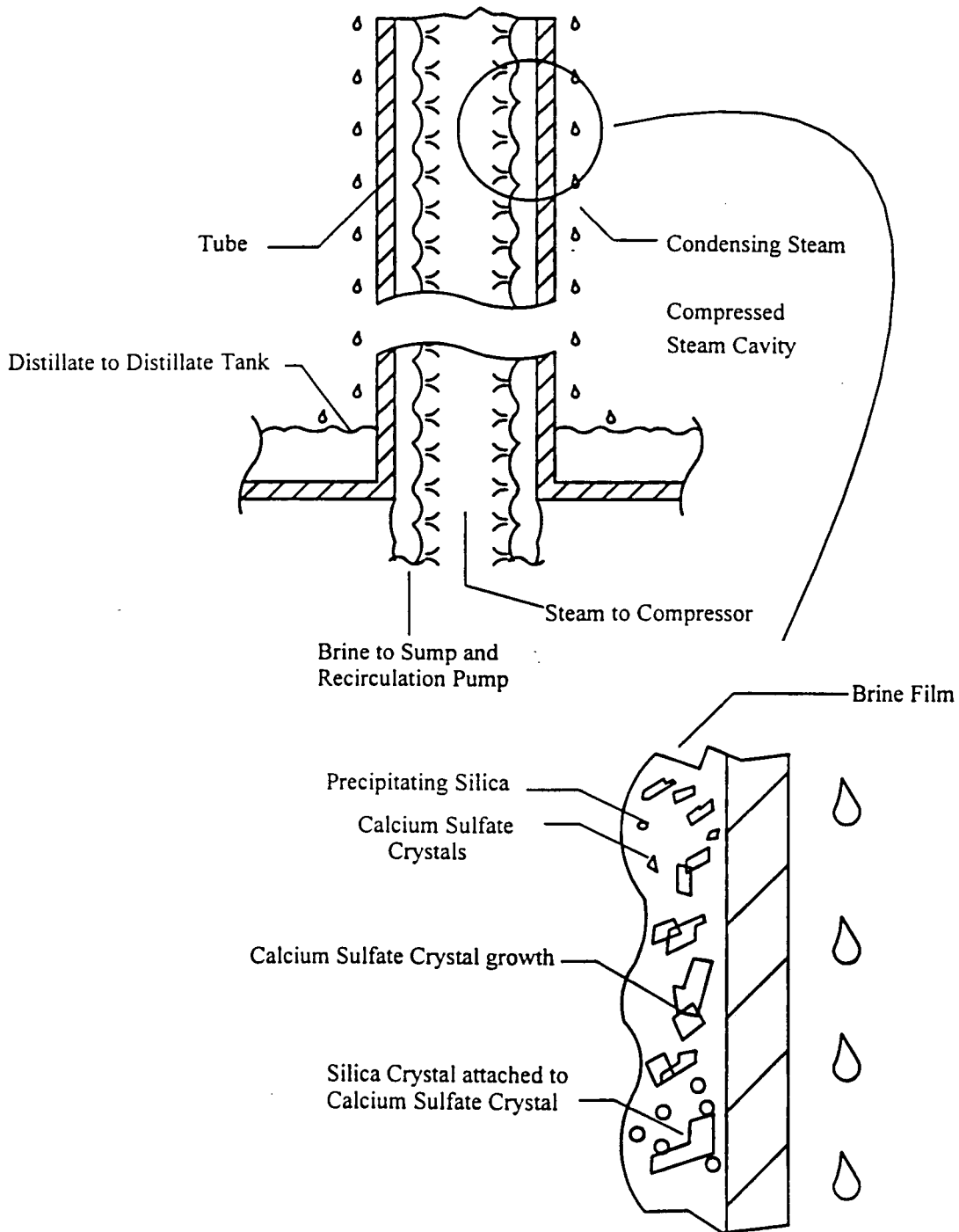
## BRINE CONCENTRATOR DEAERATOR

FIGURE A-3

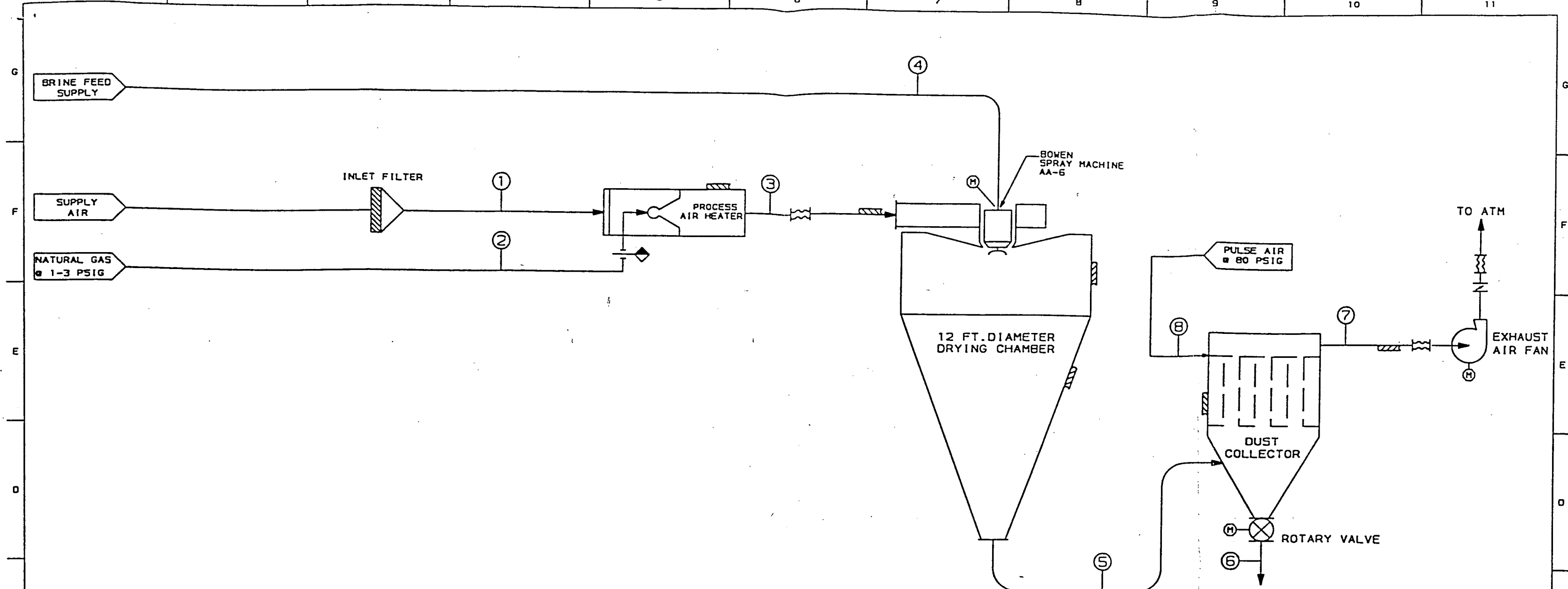


SEAL LEG

FIGURE A-4



Brine Concentrator Tube Cross Section



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	0.565		
VOLUME FLOW, ACFM (GPM)	1385	27.9	4219	(3)	2917		2940	0.3		
COMMENTS										

GENERAL REVISION		YTD				1		NIBCO INC. CHEMICAL DIVISION 1000 N. W. 10th Ave., Ft. Lauderdale, FL 33304 Phone: (305) 466-1000
CERTIFIED		YTD				0		
REVISION		DATE	BY	APP	DATE	REV		
DATE	BY	DATE	BY	DATE	BY	DATE		
DATE	BY	DATE	BY	DATE	BY	DATE		
PROJECT: PASCO CLIENT: PASCO, FLORIDA DRAWN: JRG CHECK: NONE CONTRACT NO.: 020-5109 ACTIVITY: 0412 1 5109-0412-001							PROCESS FLOW DIAGRAM SPRAY DRYER SYSTEM PASCO COUNTY LEACHATE MANAGEMENT SYSTEM	
020-5109 0412 1 5109-0412-001 1 1 1							00045816	

EQUIPMENT INSTALLATION SCHEDULE									
DESCRIPTION	TAG NO.	REFERENCE DRAWING	INSTALLATION ORIENTATION	BASEPLATE ELEVATION	NOMINAL GROUT ALLOWANCE	WEIGHT LBS.	REMARKS	BOLTING REQUIREMENTS	
								QTY	SIZE
EVAPORATOR	E-120	ALASKAN COPPER WORKS W-4938	12" RECIRC. OUTLET @ 180°	0'-0"	1"	25,272		18	1 1/4" HEX NUT & WASHER
EVAPORATOR EQUIPMENT SKID	-	LAUREN ENGINEERS, INC. 525-52	RECIRC. PUMP SUCTION @ 0°	0'-0"	1"	19,000		12	3/4" HEAVY HEX NUT & WASHER
FEED SKID	-	LAUREN ENGINEERS, INC. 525-51	SPRAY DRYER FEED PUMP SUCTION @ 0°	0'-0"	1"	7,000		8	3/4" HEAVY HEX NUT & WASHER
DEAERATOR/DISTILLATE TOWER	-	LAUREN ENGINEERS, INC. 525-53	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 MANUFACTURER'S INSTALLATION INSTRUCTIONS & RCC SPEC. 815-15050		
INLET SILENCER	C-132A	STODDARD SILENCER INC 824854	16" OUTLET FLANGE @ 0°	0'-0"	2"	2,500		3	3/4" HEAVY HEX NUT & WASHER
OUTLET SILENCER	C-132B	STODDARD SILENCER INC 74-8618	14" INLET FLANGE @ 180°	0'-0"	2"	3,000		3	3/4" HEAVY HEX NUT & WASHER
REGULATION SUCTION DUCT	ER-101-SP-12"	ALASKAN COPPER W-4964	SEE SHEET 1, 2 & 3	-	-	850			SEE BOLT SCHEDULE THIS SHEET
REGULATION DISCHARGE DUCT	ER-102-SP-8"	ALASKAN COPPER W-4964	SEE SHEET 1, 2 & 3	-	-	1,700			SEE BOLT SCHEDULE THIS SHEET
VAPOR SUCTION DUCT	EV-101-SSI-14"	ALASKAN COPPER W-4963	SEE SHEET 1, 2 & 3	-	-	1,900			SEE BOLT SCHEDULE THIS SHEET
VAPOR DISCHARGE DUCT	EV-102-SSI-12"	ALASKAN COPPER W-4963	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 AP15780	2" FEED OUTLET @ 180°	0'-0"	-	3,000	FOR ANCHOR HOLDDOWN PLATE SEE PALMER OF TEXAS AP15780 SHIT 4	4	3/4" HEAVY HEX NUT & WASHER
SPRAY DRYER FEED TANK MIXER	MX-302	THE BURHANS-SHARPE CO A4790	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. 525-53 & 58	SEE SHEET 1	-	-	80	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. A5008	SEE REMARKS	0'-0"	1"	80	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. A5008-1	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 C11614	SEE SHEET 1	0'-0"	1"	2000			
EVAPORATOR SEAL LEG	E-130	ALASKAN COPPER WORKS W-4963	SEE REMARKS	0'-0"	1"	300			
RUST INHIBITOR DISPENSER	T-136	OIL-RITE CORPORATION CATALOG # B-1264-1	SEE REMARKS	-	-	-			
FEED SKID BRIDGE	-	LAUREN ENGINEERS, INC. 525-51 & 57	SEE SHEET 1	-	-	-			
SERVICE PLATFORM	-	LAUREN ENGINEERS, INC. 525-51 & 57	SEE SHEET 1	-	-	-			
EVAPORATOR FLOOR BOX PLATFORM & LADDER	-	LAUREN ENGINEERS, INC. 525-53 & 58	SEE SHEET 1	-	-	-			
SPRAY DRYER BRIDGE AND LADDER	-	LAUREN ENGINEERS, INC. 525-53 & 58	SEE SHEET 1	-	-	-			
SPRAY DRYER	-	MRO INC. 5108-0410-001, 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	-	MRO INC. 5108-7100-002 & 004	SEE REMARKS	-	-	-			
DRAIN SUMP PUMPS	P-081A/B	TYBROC C40127	2" DISCHARGE ON EAST SIDE	-	-	240 EA.		4 EA.	5/8" x 1 3/8" 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

BOLT AND GASKET SCHEDULE FOR PIPING (BY OTHERS)												
SYMBOL	GASKET (PER JOINT)				BOLT (PER JOINT)	HEX NUT (PER JOINT)		WASHER (PER JOINT)		REMARKS		
	QTY.	TYPE	SIZE	MAT'L. SEE NOTE 8		QTY.	SIZE IN INCHES	QTY.	SIZE IN INCHES			
□												
1	1	RING	14" ID X 18 1/8" OD		12	1"	1"x8UNC 3/4" LG	12	1"x8UNC	12	1"	EVAPORATOR E-120 OUTLET TO VAPOR SUCTION DUCT EV-101-SSI-14"
2	-	-	-	-	12	1"	1"x8UNC 1" LG	24	1"x8UNC	24	1"	VAPOR SUCTION DUCT EV-101-SSI-14" TO V-514
3	1	FULL FACE	14" ID X 18 1/8" OD		12	1"	1"x8UNC 1 1/2" LG	12	1"x8UNC	12	1"	VAPOR SUCTION DUCT EV-101-SSI-14" INLET SILENCER C-132A
4	2	RING	12 3/4" ID X 18 1/8" OD		12	1"	1"x8UNC 1 1/2" LG	24	1"x8UNC	24	1"	VAPOR SUCTION DUCT EV-101-SSI-12" BYPASS TO HW-1310
5	1	FULL FACE	16" ID X 23 1/2" OD		8	1"	1"x8UNC 1 1/4" LG	16	1"x8UNC	16	1"	INLET SILENCER C-132A OUTLET TO EXPANSION JOINT XJ-04
6	-	-	-	-								XJ-04 TO INLET ON COMPRESSOR K-130
7	-	-	-	-								BOLTING SUPPLIED WITH COMPRESSOR
8	1	FULL FACE	14" ID X 21" OD		4	1"	1"x8UNC 1 1/4" LG	12	1"x8UNC	12	1"	COMPRESSOR K-130 OUTLET TO XJ-05
9	1	FULL FACE	12 3/4" ID X 18" OD		8	1"	1"x8UNC 1" LG	12	1"x8UNC	12	1"	BOLTING SUPPLIED WITH COMPRESSOR
10	-	-	-	-	12	1"	1"x8UNC 1 1/2" LG	12	1"x8UNC	12	1"	XJ-05 TO INLET ON OUTLET SILENCER C-132B
11	1	RING	12 3/4" ID X 18 1/8" OD		12	1"	1"x8UNC 3/4" LG	12	1"x8UNC	12	1"	OUTLET SILENCER OUTLET TO VAPOR DISCHARGE DUCT EV-102-SSI-12"
12	1	RING	8 5/8" ID X 8 3/4" OD		8	3/4"	3/4"x10UNC 1" LG	8	3/4"x10UNC	8	3/4"	VAPOR DISCHARGE DUCT EV-102-SSI-12" TO V-500
13	-	-	-	-	4	7/8"	7/8"x8UNC 3/4" LG	12	7/8"x8UNC	12	7/8"	VAPOR DISCHARGE DUCT EV-102-SSI-12" TO EVAPORATOR E-120 INLET
14	-	-	-	-	4	7/8"	7/8"x8UNC 3/4" LG	12	7/8"x8UNC	12	7/8"	EVAPORATOR E-120 RECIRC. OUTLET TO XJ-03
15	-	-	-	-	4	7/8"	7/8"x8UNC 3/4" LG	12	7/8"x8UNC	12	7/8"	XJ-03 TO EVAPORATOR SUCTION DUCT ER-101-SP-12"
16	-	-	-	-	12	7/8"	7/8"x8UNC 1 1/2" LG	24	7/8"x8UNC	24	7/8"	EVAPORATOR SUCTION DUCT ER-101-SP-12" TO V-405
17	1	FULL FACE	10 3/4" ID X 18" OD		12	7/8"	7/8"x8UNC 1" LG	12	7/8"x8UNC	12	7/8"	EVAPORATOR SUCTION DUCT ER-101-SP-12" TO RECIRC PUMP P-121 SUCTION
18	1	RING	8 5/8" ID X 11" OD		8	3/4"	3/4"x10UNC 3/4" LG	8	3/4"x10UNC	8	3/4"	RECIRC PUMP P-121 DISCH. TO ER-102-SP-8"
19	1	RING	8 5/8" ID X 11" OD		8	3/4"	3/4"x10UNC 1" LG	8	3/4"x10UNC	8	3/4"	EVAPORATOR RECIRC DISCHARGE DUCT ER-102-SP-8" AT BREAK FLANGES
20	1	RING	10 3/4" ID X 13 3/8" OD		12	7/8"	7/8"x8UNC 3/4" LG	12	7/8"x8UNC	12	7/8"	EVAPORATOR RECIRC DISCHARGE DUCT ER-102-SP-10" TO EVAPORATOR E-120 INLET
20	1	FULL FACE	4 1/2" ID X 8" OD		8	5/8"	5/8"x11UNC 1" LG	8	5/8"x11UNC	16	5/8"	DRAIN SUMP LEVEL TRANSMITTER LT-0630

NOTES:  
1. FOR GENERAL NOTES SEE SHIT 1.

REVISIONS					REVISIONS				
LTR	BY	CHK	APP	DATE	LTR	BY	CHK	APP	DATE
Δ	THN	BCK	MTW	11/1/84					

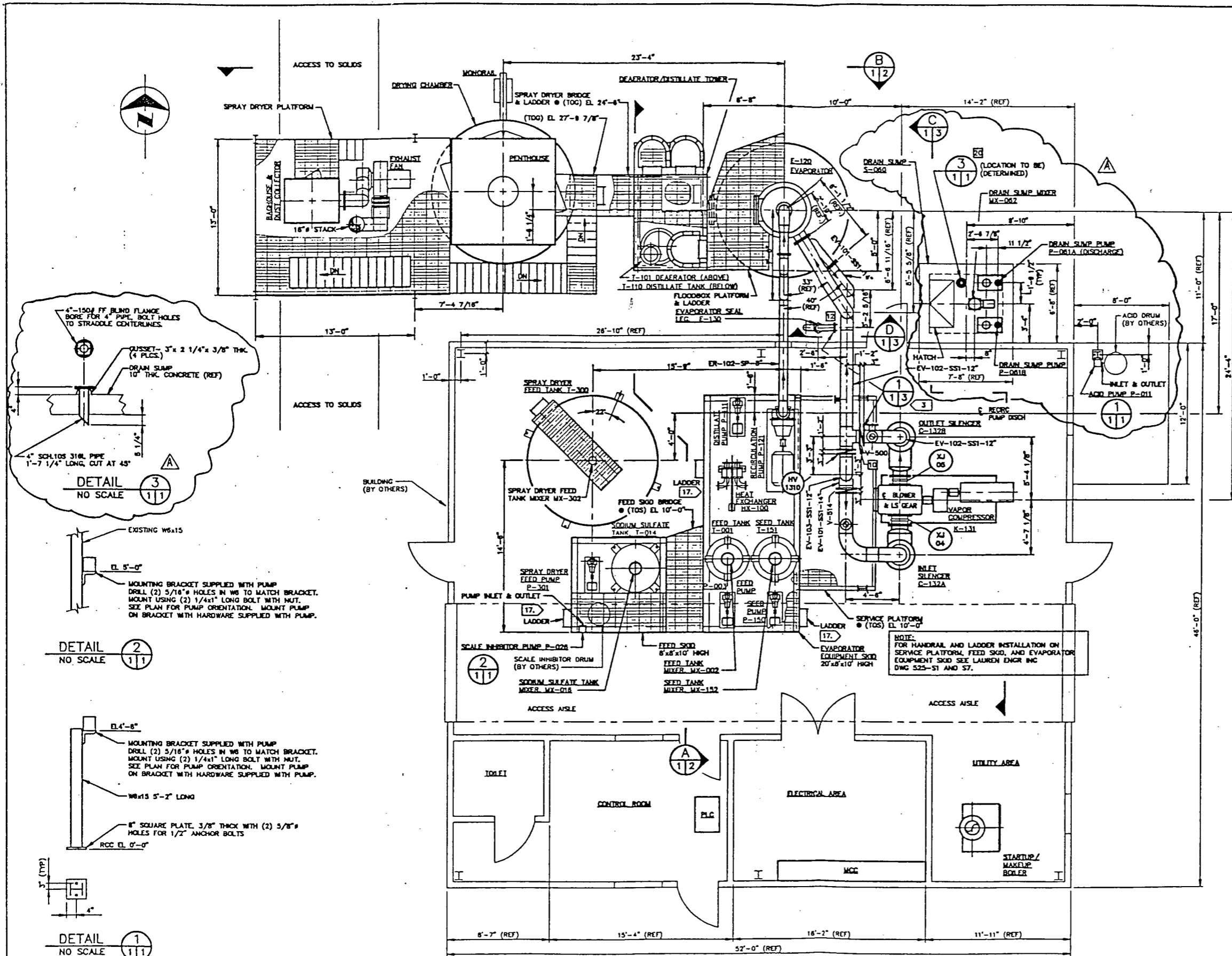
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ENG RECORD		DRAWING STATUS	
T. NADEAU	ISSUED	DATE	
E.K. KRAVETSKY			
M. McCLURKIN			
M. WOOLLEY			

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

EQUIPMENT INSTALLATION SECTIONS & DETAILS		DRAWING NO. 615-M5-1
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM		SHEET NO. 3
CUSTOMER ORDER NO. 94-2168B		SCALE 1/4"=1'-0" REV. 
RESOURCES CONSERVATION COMPANY		





PLAN VIEW

# GENERAL NOTES

- ALL ELEVATIONS ARE REFERENCED TO RCG 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.
- EQUIPMENT LISTED IN THE EQUIPMENT INSTALLATION SCHEDULE WILL BE PROVIDED BY RCC AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF EQUIPMENT IN ACCORDANCE WITH THESE DRAWINGS AND ANY REFERENCE DRAWINGS, MANUFACTURER'S INSTRUCTIONS AND RCC SPECIFICATION 615-15000.
- ONE END OF RCC SUPPLIED DUCT PROVIDED WITH FIELD TRIM ALLOWANCE. CONTRACTOR SHALL DETERMINE EXACT LENGTH AND TRIM AT TIME OF INSTALLATION.
- 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 (6" THRU 14") TO PERMIT PIPING ADJUSTMENTS AND ALIGNING OF PIPING TO EQUIPMENT.
- 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.
- 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.
- ALL GROUT SHALL BE EMBEDCO 636 NON-SHRINK OR AN APPROVED EQUAL.
1. [2], ETC. INDICATES BOLTING REQUIREMENTS. (SEE BOLT & GASKET SCHEDULE SHEET 4).  
A. HEX HEAD OR STUD BOLT A-183 OR B7, W/HEX NUTS A-184-7 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.
- 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.
- INSTALL 1" PACKING SADDLES (PROVIDED BY RCC) INSIDE DEAERATOR TO A HEIGHT OF 7'-6" ABOVE PACKING SUPPORT TRAY.
- MATERIAL FOR EVAPORATOR PIPING SWAY BRACES, SPRING CANS AND PIPE SUPPORTS SHALL BE PROVIDED BY CONTRACTOR.
- 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. ALUMIN TO ALUMIN SHALL BE WELDED WITH INCONEL WELDING WIRE SUCH AS ERNICHROM-3 PER CODE (CASE 2126).  
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 (SWAW).  
D. 316L TO 316L AND 317L TO 317L SHALL BE WELDED WITH ERNICHROM-3 OR ERNICHROM-3 (CASE 2126).  
E. 304L OR 316L TO ALUMIN SHALL BE WELDED WITH ERNICHROM-3 (CASE 2126).  
ALL WELDS TO BE CLEANED WITH STAINLESS WIRE BRUSH. ALL WELD SPATTER TO BE REMOVED.
- ALUMIN DUCTS: ER-101-SP-12, & ER-102-SP-8" 316L SS DUCTS: EV-101-SS1-14", EV-102-SS1-12" REFER TO RCC SPECIFICATION 615-15000 AND 615-15072 FOR ALL OTHER PIPING MATERIAL DESIGNATIONS (SS1, SSS, ETC.)
- NO WELDING, GRINDING OR OTHER MECHANICAL WORK IS ALLOWED ON ANY VESSELS OR TANKS.
- 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	18" 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.

- INSTALL TWO (2) MIST ELIMINATORS PER OTTO H. YORK INSTALLATION INSTRUCTIONS AND DWG. AD-33157-01. ALL THE WIRE SUPPLIED WITH MIST ELIMINATORS. REFERENCE ALASKAN COPPER DWG. W-4838, SHEET 3 FOR LOCATION OF MIST ELIMINATORS. CONTRACTOR TO PROVIDE SCAFFOLDING INSIDE SUMP FOR MIST ELIMINATOR INSTALLATION.
- FOR INSULATION OF EQUIPMENT SEE RCC SPECIFICATION 615-15281.
- LADDERS ON EVAPORATOR EQUIPMENT SKID (2 RECD), LADDER ON FEED SKID AND LADDER FROM GRADE TO ELEVATION 18'-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" HELI TYPE ANCHOR BOLTS (2 PER LADDER, SUPPLIED BY CONTRACTOR), AND GROUT.

LTR	REVISIONS	BY	CHK	APP	DATE	LTR	REVISIONS	BY	CHK	APP	DATE
1	ADDED SUMP PUMPS/MIXER, MODIFICATION TO DUCT.	THW	Bom	MTW	11/6/98						
2	NOTE 12 & 17 REVISION, AND ADDED DETAIL 3.										

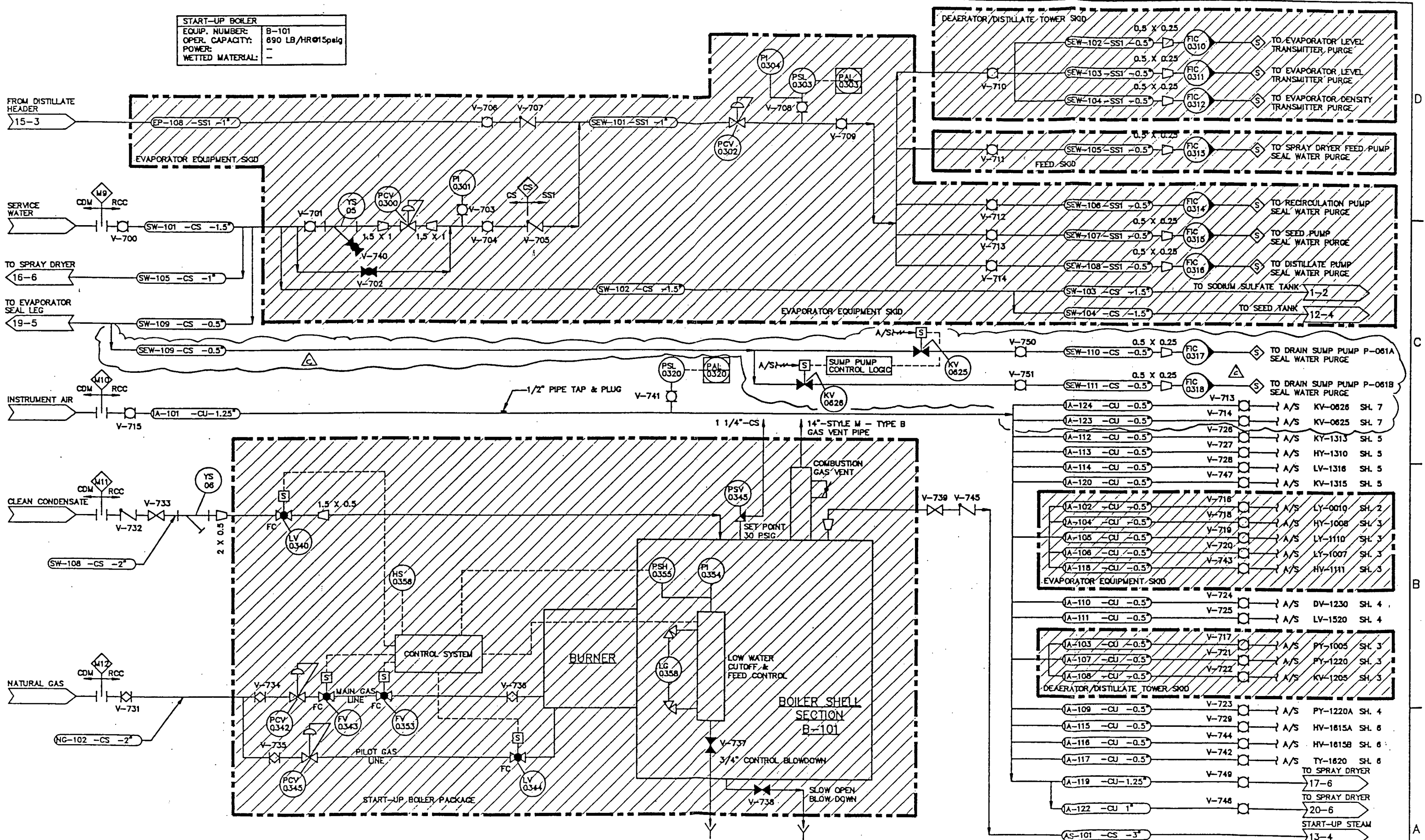
LTR	REVISIONS	BY	CHK	APP	DATE

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ENG RECORD	DRAWING STATUS
T. NADEAU	ISSUED
E.K. KRAVETSKY	
M. McCLURKIN	
M. WOOLLEY	

EQUIPMENT INSTALLATION PLAN VIEW	DRAWING NO. 615-M5-1
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM	SHEET NO. 1 OF 4
CUSTOMER ORDER NO. 94-21688	SCALE 1/4"=1'-0"
RESOURCES CONSERVATION COMPANY	

START-UP BOILER  
EQUIP. NUMBER: B-101  
OPER. CAPACITY: 890 LB/HRT @ 15 psig  
POWER: -  
WETTED MATERIAL: -



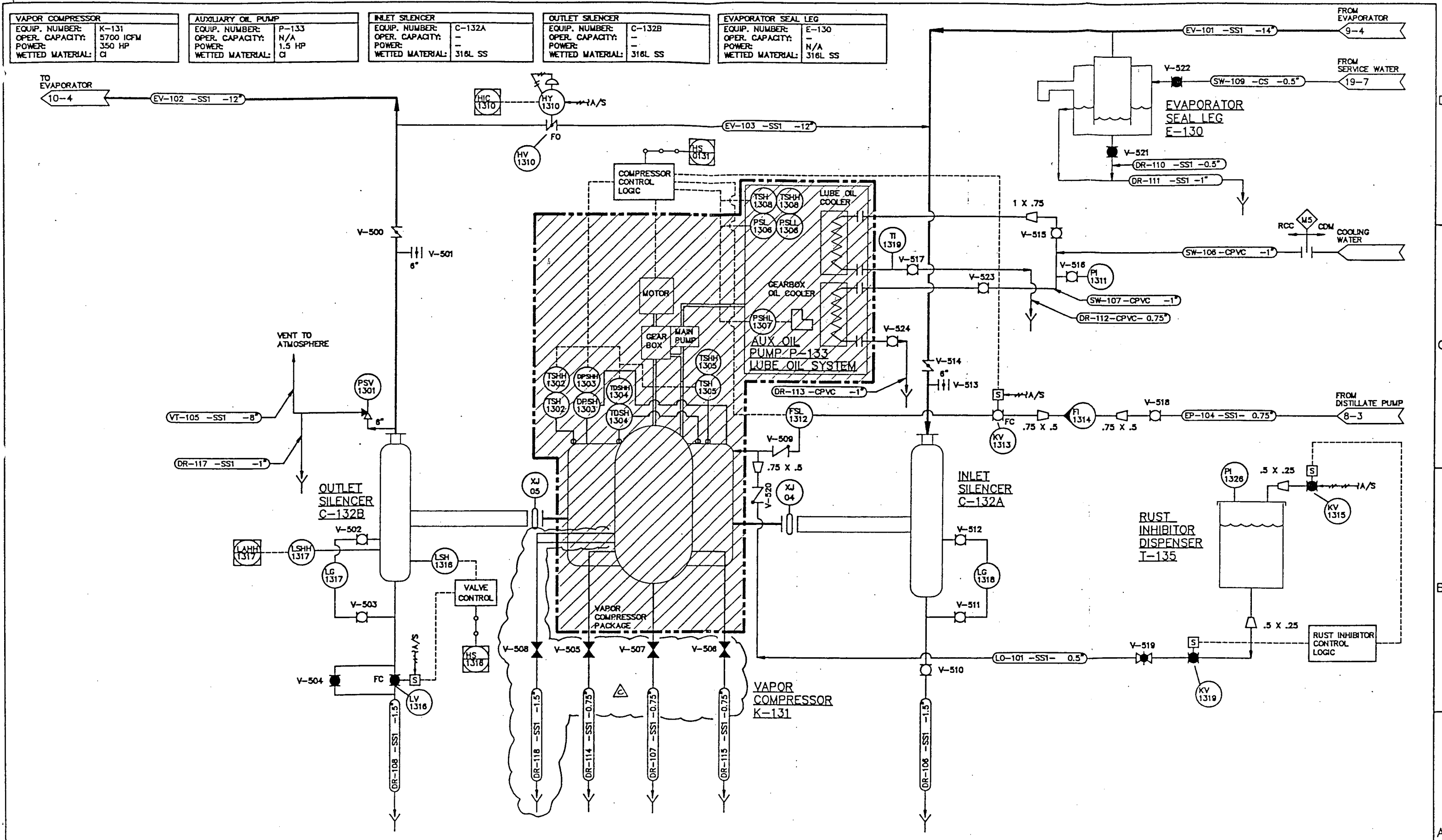
LTR	REVISIONS	BY	CHK	APP	DATE	LTR	REVISIONS	BY	CHK	APP	DATE
A	GENERAL REVISIONS	JCV	WMC	MTW	10/22/93						
B	GENERAL REVISIONS	RLR	WMC	MTW	10/22/93						
C	ADDED DRAIN SUMP PUMPS SEAL WATER (SEW-109, 110, & 111)	THN	BCE	SCW	10/22/93						

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ENG RECORD	DRAWING STATUS
ROTH	ISSUED
M. MCCLURKIN	M.E. SPANN
M. MCCLURKIN	M.E. SPANN
J.L. DUNN	J.L. DUNN

P. & I.D. UTILITIES	615-M4-1
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM	SHEET NO 7
CUSTOMER ORDER NO. 94-2168	SCALE 1"=6'
RESOURCES CONSERVATION COMPANY	





REVISIONS					REVISIONS				
LTR	BY	CHK	APP	DATE	LTR	BY	CHK	APP	DATE
1	JCV	WMC	MTW	9/5/95					
2	RLR	WMC	MTW	10/25/95					
3	THN	BOX	WMC	5/10/96					
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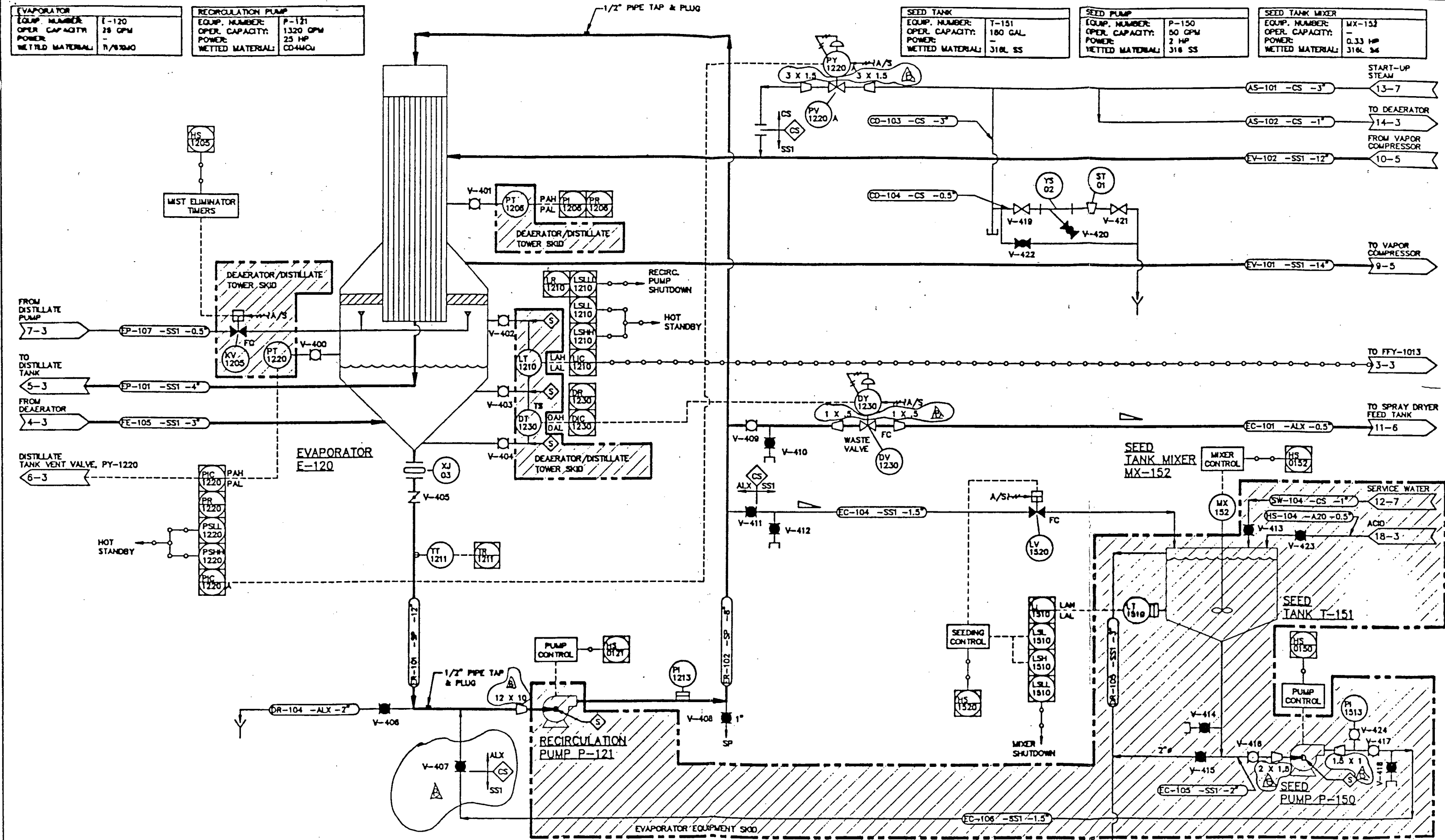
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ENG RECORD	DRAWING STATUS	DATE
ROTH	ISSUED	9/5/95
M. MCCLURKIN	M.E. SPANN	10/25/95
M. MCCLURKIN	M.E. SPANN	5/10/96
J.L. DUNN	M.E. SPANN	7/6/96

P. & I.D.		DRAWING NO.
VAPOR COMPRESSOR		615-M4-1
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM		SHEET NO. 5
CUSTOMER ORDER NO. 94-2168		SCALE: 1" = 1'-0"
RESOURCES CONSERVATION COMPANY		REV. C



REVISIONS					REVISIONS					DATE		DATE	
1	GENERAL REVISIONS	JCV	MAC	MTW	1	GENERAL REVISIONS	RLR	MAC	MTW	10/16/73		10/23/73	
2	GENERAL REVISIONS				2	GENERAL REVISIONS							
3	GENERAL REVISIONS				3	GENERAL REVISIONS							
4	GENERAL REVISIONS				4	GENERAL REVISIONS							
5	GENERAL REVISIONS				5	GENERAL REVISIONS							
6	GENERAL REVISIONS				6	GENERAL REVISIONS							
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9	GENERAL REVISIONS				9	GENERAL REVISIONS							
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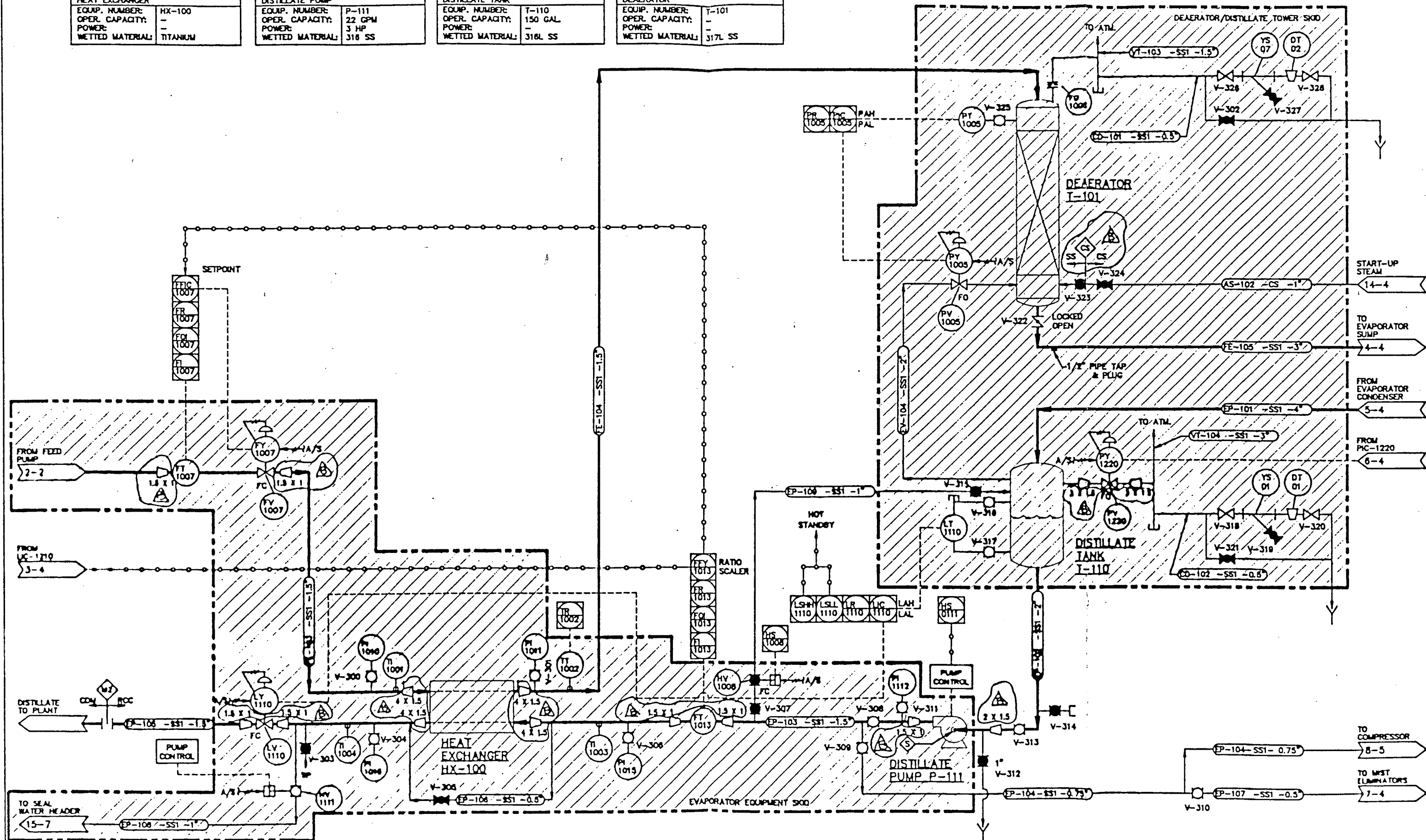
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HEAT EXCHANGER	
EQUIP. NUMBER:	HX-100
OPER. CAPACITY:	-
POWER:	-
WETTED MATERIAL:	TITANIUM

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

DISTILLATE 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



REV	REVISIONS	BY	CHK	APP	DATE	TR
1	GENERAL REVISIONS	JCV	MMK	MTW	10/1/83	
2	GENERAL REVISIONS	RLR	MMK	MTW	10/1/83	
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REV	REVISIONS	BY	CHK	APP	DATE
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PROPRIETARY  
This drawing is the property of Resources Conservation Company and the information contained herein is proprietary information which is not to be disclosed to anyone without prior written consent of said company. This drawing is to be used exclusively for the purposes hereby authorized by Resources Conservation Company through its officers and qualified representatives and for no other purpose. Reproduction of this drawing for any portion thereof, and its use without the prior written consent of said company, and any such reproduction shall be the responsibility of the user.

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ENG RECORD	DRAWING STATUS
ROTH	ISSUED
M. MCCLURKIN	M.E. SPANN
M. MCCLURKIN	M.E. SPANN
J.L. DUNN	J.E. SPANN

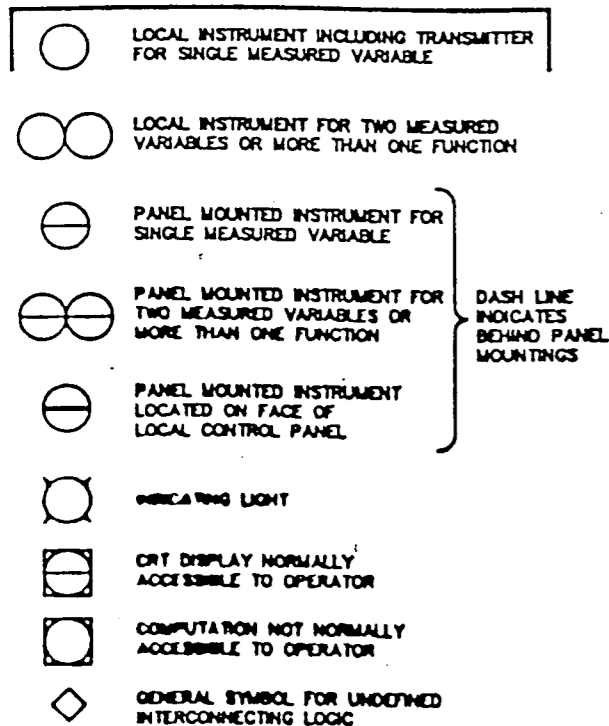
P. & I.D. FEED & DISTILLATE SYSTEM
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM
CUSTOMER ORDER NO. 94-2168
RESOURCES CONSERVATION COMPANY

615-M4-1
3
8

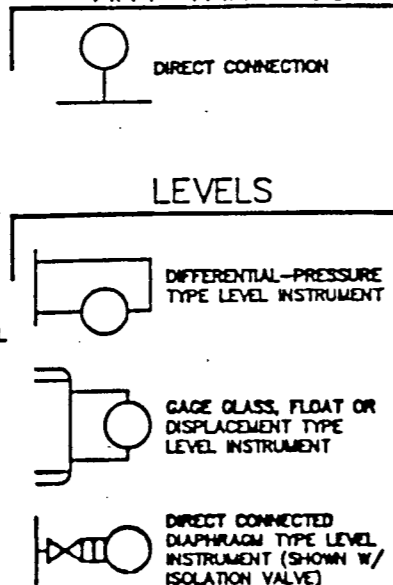
FEED TANK MIXER	
EQUIP. NUMBER:	MX-002
OPER. CAPACITY:	
POWER:	0.33 HP
METHOD MATERIAL:	

P. & I.D. PRETREATMENT SYSTEM		615-M4
PASCO COUNTY LEACHATE MANAGEMENT SYSTEM		2
CUSTOMER ORDER NO. 94-2168		
RESOURCES CONSERVATION COMPANY		

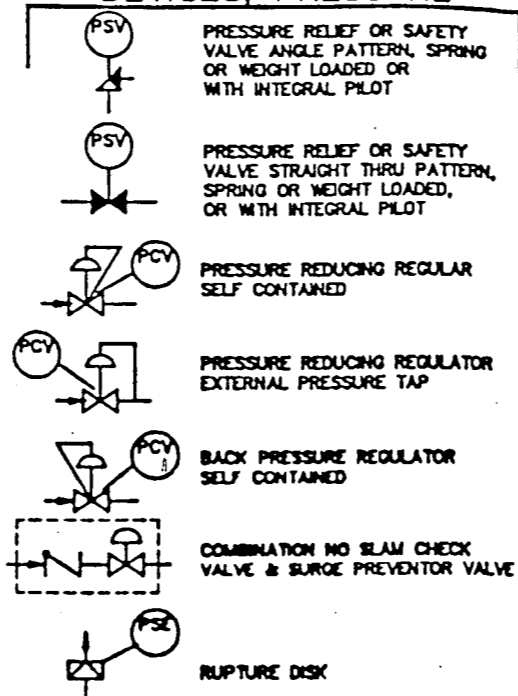
## INSTRUMENTS



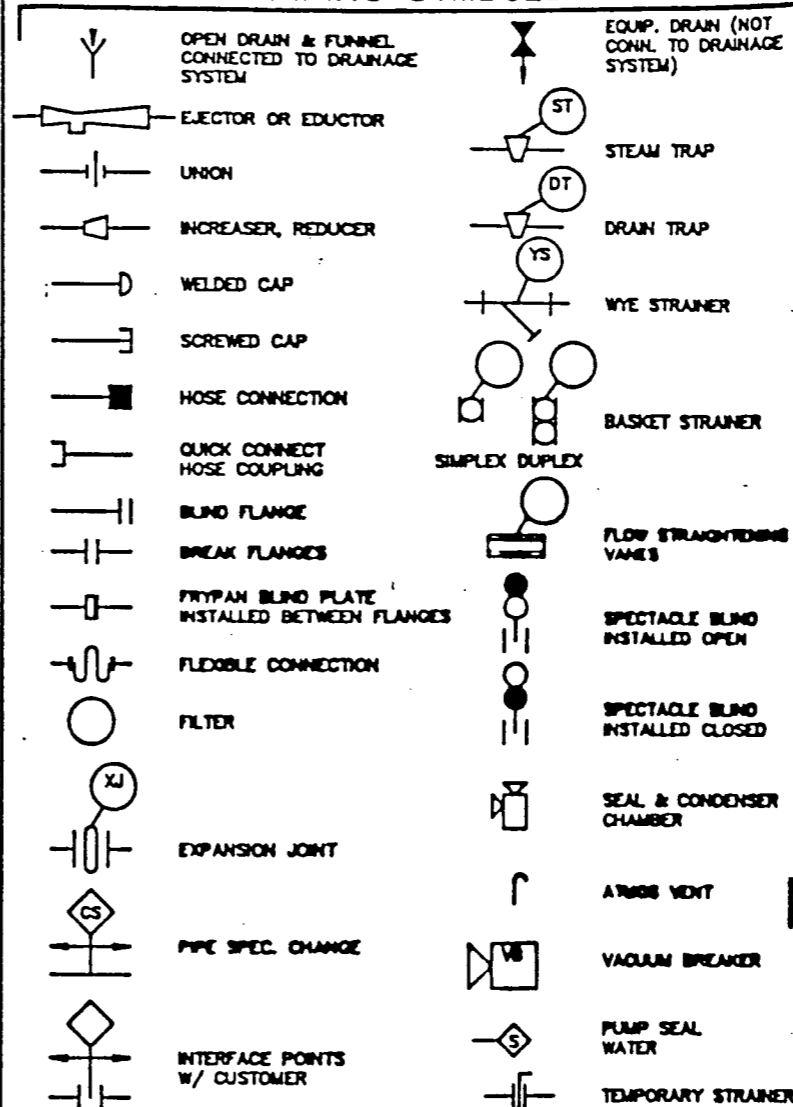
## TYPICAL CONNECTION ANY VARIABLE



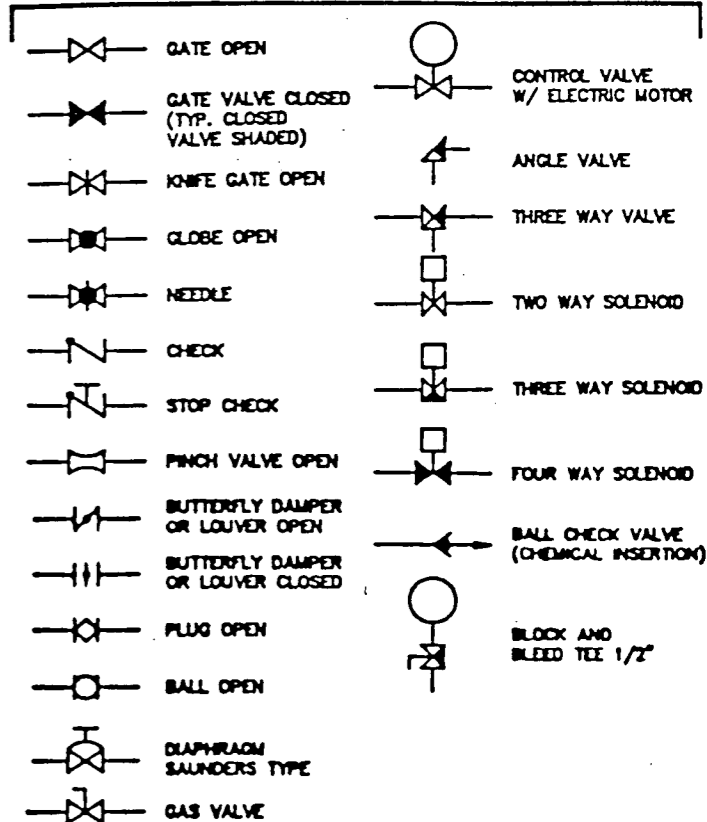
## SELF ACTUATED DEVICES, PRESSURE



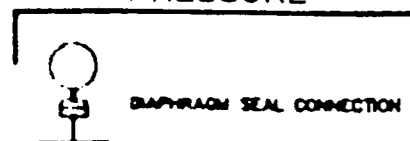
## PIPING SYMBOLS



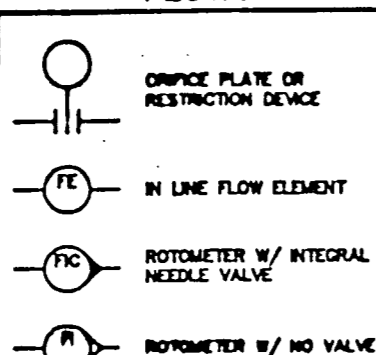
## VALVE SYMBOLS



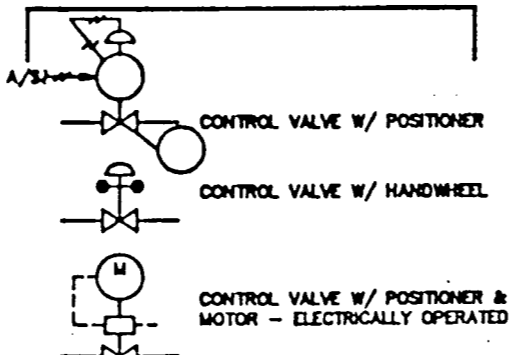
## PRESSURE



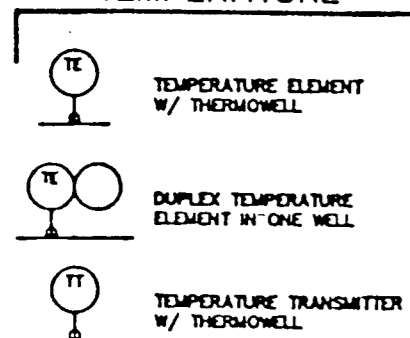
## FLOWS



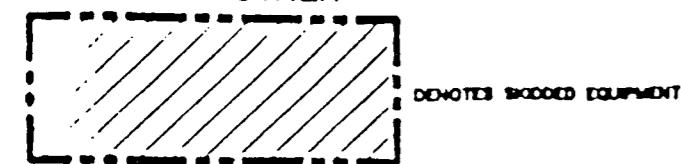
## ACTUATORS



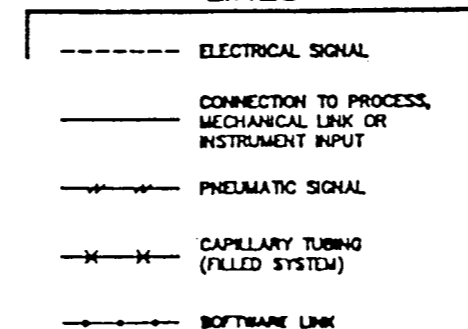
## TEMPERATURE



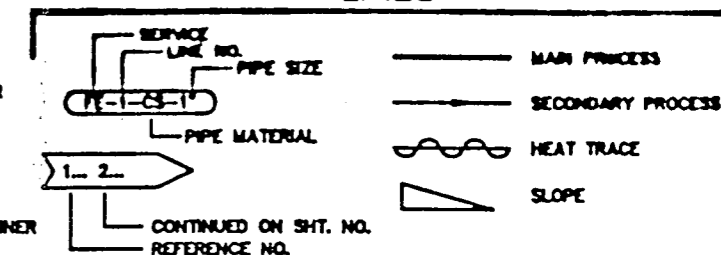
## OTHER



## LINES



## LINES



## ABBREVIATIONS &amp; MISCELLANEOUS

## PIPING SERVICE &amp; ABBREVIATION LEGEND

AC	AIR CLOSURES	AS	AUXILIARY STREAM
AO	AIR OPENS	CD	STEAM CONDENSATE
A/S	INSTRUMENT AIR SUPPLY	CL	SCALE INHIBITOR
CS	CHANGE SPECIFICATION	DR	DRAIN
FC	FAIL CLOSE ON AIR SUPPLY LOSS	DW	DEAERATOR WATER
FD	FLOOR DRAINAGE SYSTEM	EC	EVAPORATOR CONCENTRATE
FO	FAIL OPEN	EP	EVAPORATOR PRODUCT
HC	NORMALLY CLOSED	ER	EVAPORATOR RECIRCULATION
NO	NORMALLY OPEN	EY	EVAPORATOR VAPOR
P/S	PURGE WATER SUPPLY	FE	FEED
RTD	RESISTANCE TEMPERATURE DETECTOR	HS	SULFURIC ACID
SP	SAMPLE VALVE (1/2" SIZE UNLESS OTHERWISE NOTED)	IA	INSTRUMENT AIR
T/C	THERMOCOUPLE	LO	LUBE OIL
V	VENTED TO ATMOSPHERE	NG	NATURAL GAS
W/S	WATER SUPPLY	SA	SERVICE AIR
CO	CHAIN OPERATED	SEW	SEAL WATER
TDS	TOTAL DISSOLVED SOLIDS	SS	SODIUM SULFATE
TS	TOTAL SOLIDS	SW	SERVICE WATER
TSS	TOTAL SUSPENDED SOLIDS	VI	VENT

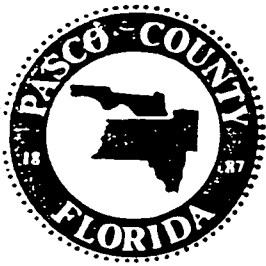
## NOTES

- ALL INSTRUMENTATION SYMBOLS & IDENTIFICATION ARE PER THE INSTRUMENT SOCIETY OF AMERICA (I.S.A.) STANDARD-LATEST REVISION ANSI Y32.20.1975.
  - 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: ALUMINUM  
CS: CARBON STEEL  
CU: COPPER  
OPVC: CHLORINATED POLYVINYLCHLORIDE  
SP: SPECIAL DESIGN  
SS316: 316L STAINLESS STEEL

REVISIONS	BY	CHK	APP	DATE	REV	REVISIONS	BY	CHK	APP	DATE	REV	PROPERTY	ENG RECORD	DRAWING STATUS	P. & I.D. LEGEND	615-M4-1
1	JCV	MCC	WTR	10/1/83	1							RESOURCES CONSERVATION COMPANY	ROTH	REVISED	PASCO COUNTY LEACHATE MANAGEMENT SYSTEM	1 OF 7
2	EKK	WTR	WTR	10/1/83	2							RESOURCES CONSERVATION COMPANY	M. MCCLURKIN	REVISED	CUSTOMER ORDER NO. 94-2168	
3					3							RESOURCES CONSERVATION COMPANY	M. MCCLURKIN	REVISED		
4					4							RESOURCES CONSERVATION COMPANY	J.L. DUNN	REVISED		







# 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.

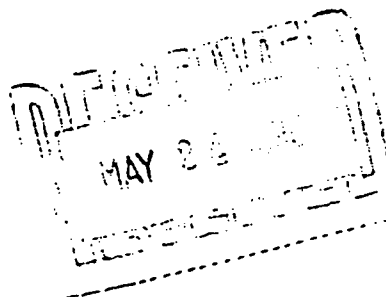
Sincerely,

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 Proprietary 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.

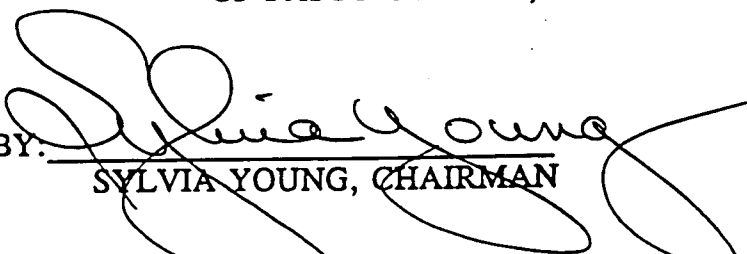
WHEREFORE, THIS agreement has been executed on behalf of the OWNER and SELLER as of the Agreement Date.

(SEAL)

ATTEST:

BY: \_\_\_\_\_  
JED PITTMAN, CLERK

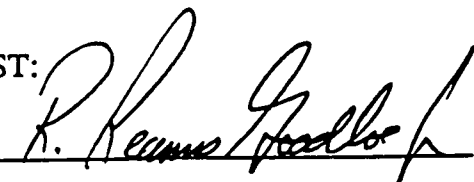
BOARD OF COUNTY COMMISSIONERS  
OF PASCO COUNTY, FLORIDA


BY:   
SYLVIA YOUNG, CHAIRMAN

(SEAL)

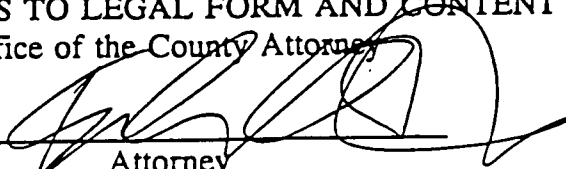
RESOURCES CONSERVATION COMPANY  
A Division of Ionics, Inc.

ATTEST:

BY:   
R. Reams Galloway

BY:   
JOSEPH L. PHARES  
VICE PRESIDENT

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

By:   
Attorney

E

Appendix  
E

## Appendix E

# Leachate Treatment Facility As-Built Drawings (Provided Separately)