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APPLICATION FOR PERMIT TO OPERATE (PTO) FOR THE ADVANCE WASTEWATER TREATMENT FACILITY (AWWT) AT THE FERNALD ENVIRONMENTAL MANAGEMENT (OEPA) PREMISE NO 143110128 P283

08/18/94

C:RP:94-0045
FERMCO HAMILTON COUNTY
12
PERMIT

Fernald Environmental
FERMCO
Restoration Management Corporation P.O. Box 398704 Cincinnati, Ohio 45239-8704 (513) 738-620

5863

August 18, 1994

U. S. Department of Energy
Fernald Environmental Management Project
Letter No. C:RP:94-0045

Mr. Peter Sturdevant
Compliance Specialist
Hamilton County Department
of Environmental Services
Air Quality Management
1632 Central Parkway
Cincinnati, Ohio 45210

Dear Mr. Sturdevant:

APPLICATION FOR PERMIT TO OPERATE (PTO) FOR THE ADVANCE WASTEWATER TREATMENT FACILITY (AWWT) AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (OEPA) PREMISE NO. 1431110128 P283

In accordance with the Permit to Install (No. 14-2767) issued for this source on February 24, 1993, enclosed is the Permit to Operate Application for the Advanced Wastewater Treatment Facility.

Please contact Ervin Fisher of my staff at 738-6053 if you have any questions.

Sincerely,

Kenneth L. Alkema
Vice President
Regulatory Programs

KLA:EF:mhv
Attachment

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Fernald Environmental
FERMCO
Restoration Management Corporation

c: S. M. Beckman, FERMCO
D. J. Brettschineder, FERMCO
T. E. Escue, FERMCO
Robert Mendelsohn, DOE Contract Specialist
E. P. Skintik, DOE-FN
P. B. Spotts, FERMCO
AR Coordinator
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RTS Files (P283)

PERMIT TO OPERATE APPLICATION

ADVANCED WASTEWATER TREATMENT FACILITY

OEPA ID NO. P283

FEMP ID NOS. 51-001/041

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

Dept. of Energy - Fernald Environ. Management Project Facility Name	Stephen M. Beckman Person to Contact
7400 Willey Road Facility Address	P. O. Box 398704 Mailing Address
Fernald / Hamilton / 45030 City / County / Zip	Cincinnati / Ohio / 45239 City / State / Zip
(513) 738-6200 Telephone Area Number	(513) 738-6502 Telephone
1431110128 P283 (Application no., if this is a renewal application)	4953 Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

X Appendix A, Process
__Appendix B, Fuel-Burning Equipment
__Appendix C, Incinerator
__Appendix D, Surface Coating or Printing Operation
__Appendix E, Storage Tank
__Appendix H, Gasoline Dispensing Facility
__Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
__Appendix K, Surface Coating Line or Printing Line
__Appendix L, Solvent Metal Cleaning
__Appendix M, Fugitive Dust Emission Sources _____ (Specify Appendix No.)
__Appendix N, Rubber Tire Manufacturing
__Appendix O, Dry Cleaning Facility
__Appendix P, Landfills
__Other Appendix_____
__Compliance Time Schedule

2. Description of Source (same as used on appendix): Advance Wastewater Treatment Facility (AWWT)

3. Your identification for Source (same as used on appendix): FEMP ID No. 51-001 through 51-041

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

1) Attachment
   a) Appendix A
   b) Process Flow Diagram (Fig. 1)
   c) Process Flow Diagram (Fig. 2)
   d) Emission Calculations

Kenneth L. Alkema
Authorized Signature
K. L. Alkema
Vice President Regulatory Programs
Title
8/18/90
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code.

For Official Use Only

Premise No.__/__/__/__
Source No.__/__
Application No.__/__

OEPA NO. 1431110128 P283
A-1
FEMP ID NO. 51-001/041

APPENDIX A, PROCESS

PROCESS DATA

1. Name of process Advanced Wastewater Treatment for Uranium

2. End product of this process Treated wastewater

3. Primary process equipment 400 and 700 gal/min Treatment Systems
Your identification 51-001 through 51-041 Year Installed 1994

4. Manufacturer Custom Make or Model N/A

5. Capacity of equipment (lbs./hr): Rated 557118 Max. 557118

6. Method of exhaust ventilation: [ ] Stack [ ] Window fan [ ] Roof vent
[X] Other, describe Multi-tank vents, Stacks, and fugitive sources
Are there multiple exhausts? [X] Yes [ ] No

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 7 days/wk., 52 wks./year.

8. Percent annual production (finished units) by season:
Winter 25 Spring 25 Summer 25 Fall 25

9. Hourly production rates (lbs.): Average 557118 Maximum 557118

10. Annual production (indicate units) 2,440,177 tons Treated Wastewater
projected percent annual increase in production 15

11. Type of operation: [X] Continuous [ ] Batch

12. If batch, indicate Minutes per cycle N/A Minutes between cycles____

13. Materials used in process:

List of Raw Materials	Principal Use	Amount (units/hr.)
Wastewater/Groundwater	Wastestream	554400 lbs/hr
Dry Coagulant or Liquid Alum	Coagulant (Alum will be used if TRU-clear not available)	66 lbs/hr TRU-clear or 2207.5 lbs/hr Alum
Caustic	pH adjuster	200 lbs/hr
Acid	Ph adjuster	244.5 lbs/hr

14. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by products and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment.

CONTROL EQUIPMENT

Control Equipment Code:

(A)	Settling Chamber	(G)	Cyclonic Scrubber	(M)	Adsorber
(B)	Cyclone	(H)	Impingement Scrubber	(N)	Condenser
(C)	Multiple Cyclone	(I)	Orifice Scrubber	(O)	Afterburner - Catalytic
(D)	Electrostatic Precipitator	(J)	Venturi Scrubber	(P)	Afterburner - Thermal
(E)	Fabric Filter	(K)	Plate or Tray Tower	(Q)	Other, Describe Bubble Cap Tray Scrubber
(F)	Spray Chamber	(L)	Packing Tower		

15. Control Equipment Data: For Dry Coagulant Additive System

Item	Primary Collector	Secondary Collector
(a) Type (See above Code)	G	Q
(b) Manufacturer	Fisher - Klosterman	Hoffman Process
(c) Model No.	WH210	Custom
(d) Year Installed	1994	1994
(e) Your Identification	51-X180-SCB	51-X181-SCB
(f) Pollutant Controlled	Particulate	Particulate
(g) Controlled pollutant emission rate (if known) est.	0.252 lbs/hr	0.0252 lbs/hr
(h) Pressure Drop	<30 inch water	<10 inch water
(i) Design efficiency	95% @ 2 microns	90%
(j) Operating efficiency	99.55 % @ 1.5 micron	90%

STACK DATA

16. Your Stack Identification EP51-01

17. Are other sources vented to this stack? [ ] Yes [X] No
If yes, identify sources _____

18. Type: [X] Round, top inside diameter dimension 16 inch
[ ] Rectangular, top inside dimensions (L)_____ X (W)_____

19. Height: Above roof 8' 4" ft., above ground 90' 4" ft.

20. Exit gas: Temp. AMB °F, Volume 3,000 ACFM, Velocity 2143 ft./min.

21. Continuous monitoring equipment: [ ] Yes [X] No
If yes, indicate : Type _____, Manufacturer _____
Make or Model _____, Pollutant(s) monitored _____

22. Emission data: Emissions from this source have been determined and such data is included with this appendix: [X] Yes [ ] No
If yes, check method: [ ] Stack Test [ ] Emission Factor [X] Material Balance
Completed by Ervin Fisher, Jr., Date May 12, 1994

CONTROL EQUIPMENT

Control Equipment Code:

(A)	Settling Chamber	(G)	Cyclonic Scrubber	(M)	Adsorber
(B)	Cyclone	(H)	Impingement Scrubber	(N)	Condenser
(C)	Multiple Cyclone	(I)	Orifice Scrubber	(O)	Afterburner - Catalytic
(D)	Electrostatic Precipitator	(J)	Venturi Scrubber	(P)	Afterburner - Thermal
(E)	Fabric Filter	(K)	Plate or Tray Tower	(Q)	Other, Describe Bubble Cap Tray Scrubber
(F)	Spray Chamber	(L)	Packing Tower		

15. Control Equipment Data: Acid System

Item	Primary Collector	Secondary Collector
(a) Type (See above Code)	L	Q
(b) Manufacturer	Hoffman Process	Hoffman Process
(c) Model No.	Custom	Custom
(d) Year Installed	1994	1994
(e) Your Identification	51-X216A-SCB	51-X216B-SCB
(f) Pollutant Controlled	Acid Mist	Acid Mist
(g) Controlled pollutant emission rate (if known)	0.0951 lbs/hr	0.00951 lbs/hr
(h) Pressure Drop	N/A	N/A
(i) Design efficiency	90%	90%
(j) Operating efficiency	90%	90%

STACK DATA

16. Your Stack Identification EP51-02

17. Are other sources vented to this stack? [ ] Yes [X] No
If yes, identify sources _____

18. Type: [X] Round, top inside diameter dimension 4 inches
[ ] Rectangular, top inside dimensions (L)_____ X (W)_____

19. Height: Above roof N/A ft., above ground 20 ft.

20. Exit gas: Temp. AMB °F, Volume 217 ACFM, Velocity 2487 ft./min.

21. Continuous monitoring equipment: [ ] Yes [X] No
If yes, indicate : Type _____, Manufacturer _____
Make or Model _____, Pollutant(s) monitored _____

22. Emission data: Emissions from this source have been determined and such data is included with this appendix: [X] Yes [ ] No
If yes, check method: [ ] Stack Test [ ] Emission Factor [X] Material Balance
Completed by Ervin Fisher, Jr., Date May 12, 1994

SUMMARY OF TOTAL EMISSIONS FROM ADVANCED WASTEWATER TREATMENT FACILITY:

EMISSION RATE	HOURLY PM(lb)	ANNUAL PM(tons)	HOURLY U (lb)	ANNUAL U (tons)
ACTUAL	3.55×10^{-2}	1.55×10^{-1}	1.01×10^{-9}	4.42×10^{-9}
POTENTIAL	3.55×10^{-2}	1.55×10^{-1}	1.01×10^{-8}	4.42×10^{-9}
UNCONTROLLED POTENTIAL	3.49×10^{0}	1.53×10^{1}	1.01×10^{-9}	4.42×10^{-9}
ALLOWABLE	5.04×10^{0}	2.21×10^{1}		

NOTE: Water and water vapor not included in emission calculations.

Assumptions

1. Particulate emissions are based on the combined emissions from the dry coagulant system, the alum, the acid and the caustic storage systems.

2. Uranium emissions are worst case emission rates for the 22 water storage or treatment tanks.

3. Normal operating schedule is continuous or 24 hrs/day, 7 days/week and 52 weeks/year.

4. Since the AWWT will run continuously at capacity the actual and potential emissions are the same.

Emission Rates

Particulate - Dry coagulant (420 lbs/drum) (0.1% dust loading) (6 drums/hr) = 2.52 lbs/hr. Acid mist = 0.9507 lbs/hr. Caustic mist = 0.000894 lbs/hr. Alum mist = 0.0226 lbs/hr. Total particulate 3.494 lbs/hr

Uranium - 22 water storage tanks with a Total U emission estimate of 1.01 E-9 lbs/hr.

Actual and Potential Emissions

{(2.52 lbs/hr dry coagulant) (1 - 99.9%)} + {(0.951 lbs/hr acid) (1 - 99%)} + (0.000894 lbs/hr caustic) (0.0226 lbs/hr alum) = 0.0355 lbs/hr Total Particulate emission.

(0.0355 lbs/hr) (8760 hr/yr) (1 ton/2000 lbs) = 0.155 tons/yr Particulate emissions

(22 tanks U emission = 1.01 E-9 lbs/hr Uranium emissions.

(1.01 E-9 lbs/hr) (8760 hrs/yr) (1 ton/2000 lbs) = 4.42 E-9 tons/yr Uranium emissions.

Uncontrolled Potential Emissions

(2.52 lbs/hr dry coagulant) + (0.951 lbs/hr acid) + (0.000894 lbs/hr caustic) (0.0226 lbs/hr alum) = 3.494 lbs/hr Total Particulate emission.

(3.494 lbs/hr) (8760 hr/yr) (1 ton/2000 lbs) = 15.3 tons/yr Particulate emissions

(22 tanks U emission = 1.01 E-9 lbs/hr Uranium emissions.

(1.01 E-9 lbs/hr) (8760 hrs/yr) (1 ton/2000 lbs) = 4.42 E-9 tons/yr Uranium emissions.

ATTACHMENT I

APPENDIX A

FLOW DIAGRAM

EMISSIONS CALCULATIONS

FIGURE 1 - AWWT PROCESS FLOW DIAGRAM

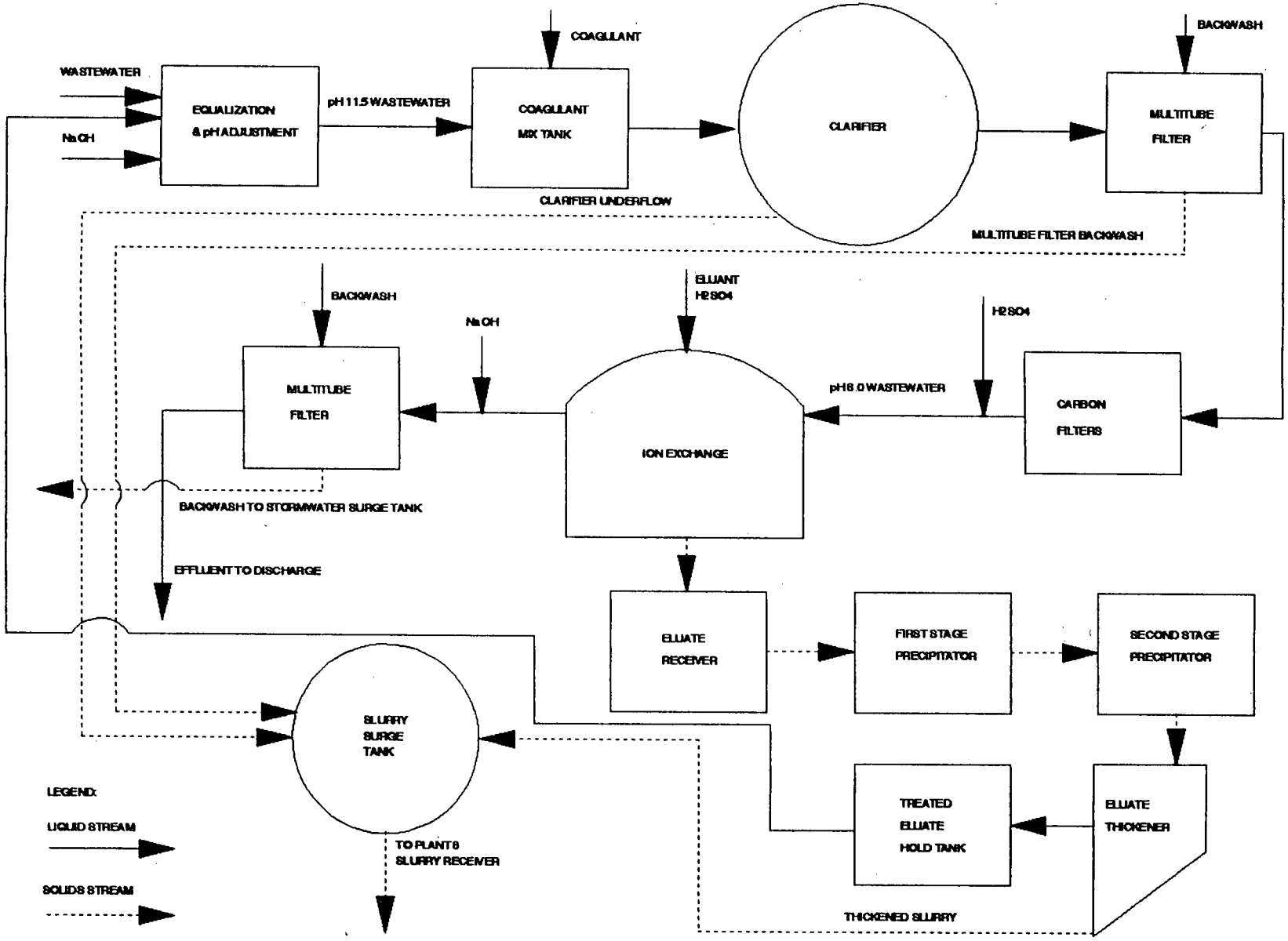

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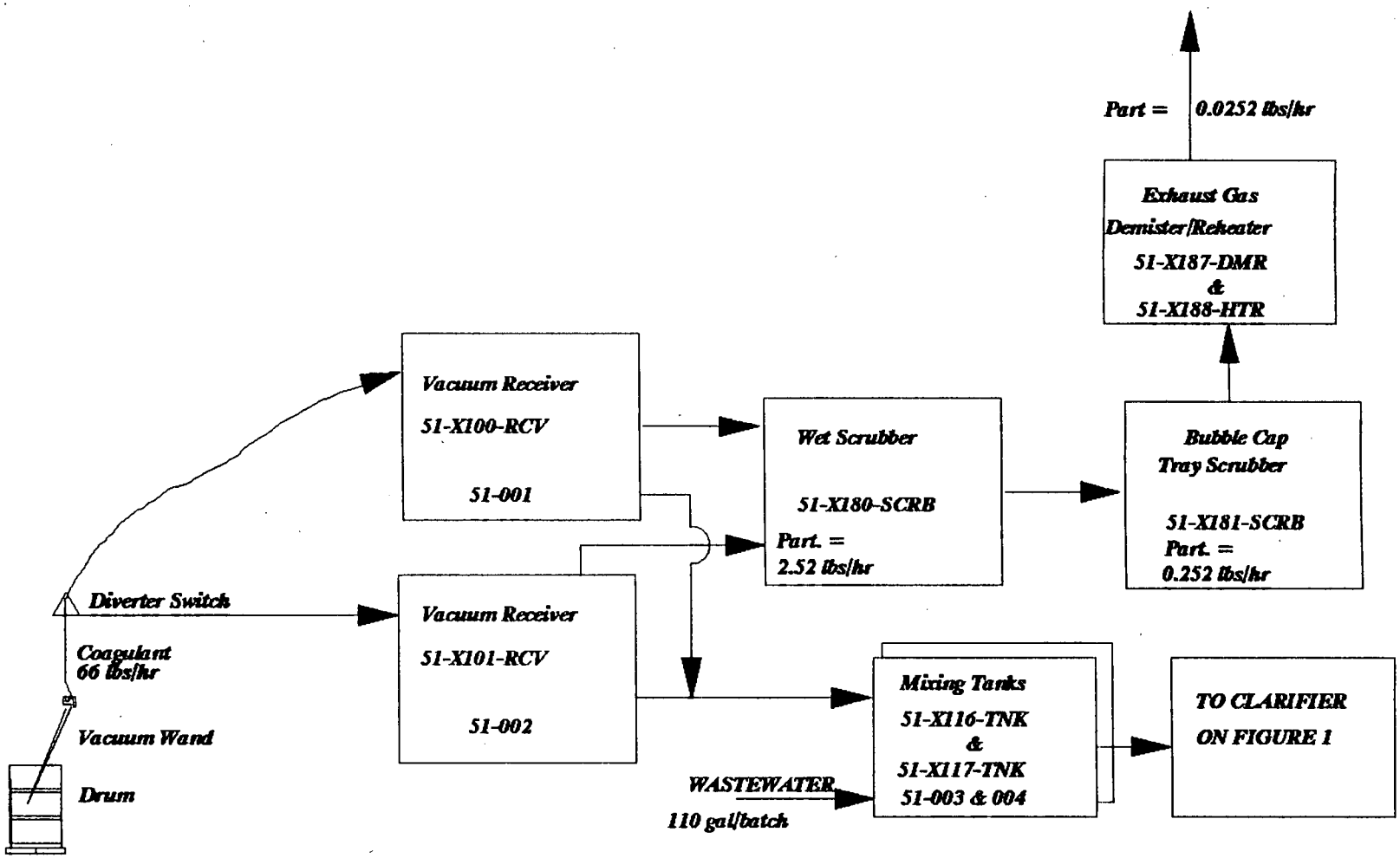
FIGURE 2 DRY COAGULANT SYSTEM
ADVANCED WASTEWATER TREATMENT FACILITY



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