Operation and Maintenance Manual

for the

Groundwater Extraction & Treatment Systems

at the

Ott/Story/Cordova Superfund Site

North Muskegon, Michigan

Submitted to

U.S. Army Corps of Engineers
Detroit District

By

Sverdrup Environmental, Inc.
St. Louis, Missouri

Sverdrup

MANUAL USER GUIDE

The Operation and Maintenance Manual for the Ott/Story/Cordova Superfund Site Groundwater Extraction and Treatment System has been prepared as required by Section 01860, Paragraph 4 of the construction contract specifications. The Operations Manual provides descriptions of the groundwater extraction and treatment systems, locations, start-up procedures, and scheduled and unscheduled maintenance requirements. Support documents, including a Master Equipment List (MEL), as-built construction drawings, and manufacturers' bulletins and warranty listings are included, either within the volumes of this manual, or by reference. A computerized record-keeping system, which includes scheduled maintenance, equipment lists, vendor information, etc., has been provided.

This O&M Manual has been divided into sections containing information on the following topics:

- General System Information
- Theory of Operation
- Normal and Alternate Operating Procedures
- Laboratory Testing Procedures
- System Maintenance Procedures
- Reporting and Record Keeping Requirements
- Safety

The Manual is intended to be read by facility operating personnel to familiarize them with the treatment process, then to more specifically train them in the operation and maintenance of individual treatment components. When more detailed instructions are necessary to accomplish maintenance or repair tasks, manufacturer operation and maintenance manuals, which are part of this manual by reference, will be used. This Manual is also used as a source of information during weekly operator meetings, when current operating conditions are discussed and required maintenance tasks are assigned. The writing style is designed to be readily comprehensible to craftsmen level personnel with a high school education.

TABLE OF CONTENTS

		PAGE
1.0	General Information and Description	1.1
1.1	Groundwater Extraction System	1.2
1.2	Groundwater Treatment System	1.14
1.2.1	Diffused Air Strippers (DAS)	1.16
1.2.1.1	DAS Basins	1.17
1.2.1.2	DAS Blowers	1.17
1.2.1.3	DAS Bypass Fans	1.17
1.2.2	Thermal Oxidation Unit (TOU)	1.18
1.2.2.1	TOU Exhaust Fan	1.18
1.2.2.2	Inlet Demister	1.19
1.2.2.3	Regenerative Thermal Oxidizer (RTO)	1.19
1.2.2.4	Caustic Scrubber	1.20
1.2.2.5	TOU Building	1.22
1.2.3	Powdered Activated Carbon Treatment (PACT)	1.22
1.2.3.1	First Stage Aeration Tank	1.23
1.2.3.2	First Stage Clarifier	1.25
1.2.3.3	Second Stage Aeration Tank	1.26
1.2.3.4	Second Stage Clarifier	1.26
1.2.3.5	Aerated Sludge Tank	1.27
1.2.3.6	Activated Sludge Blowers	1.28
1.2.3.7	Return Sludge Pumps	1.28
1.2.3.8	Sludge Transfer Pumps	1.29
1.2.3.9	Phosphoric Acid Feed Pumps	1.29
1.2.3.10	Polymer Feed System	1.30
1.2.3.11	PAC Feed System	1.31
1.2.4	Tertiary Filter System	1.32
1.2.4.1	Tertiary Filter Pumps	1.32
1.2.4.2	Ferric Chloride Feed System	1.33
1.2.4.3	Tertiary Sand Filters	1.33

TABLE OF CONTENTS (cont'd)

		PAGE
	1.2.5 Granular Activated Carbon (GAC) Treatment	1.36
	1.2.6 Solids Handling System	1.37
	1.2.6.1 Sludge Holding Tank	1.37
	1.2.6.2 Lime Conditioning System	1.38
	1.2.6.3 Filter Press Feed Pumps	1.38
	1.2.6.4 Filter Press	1.39
	1.2.6.5 Pressure Wash System	1.40
	1.2.6.6 Acid Wash System	1.41
	1.2.6.7 Filter Press Control Panel	1.42
	1.2.7 Static Aerator	1.42
2.0	Theory of Operation	2.1
	2.1 Diffused Air Stripping	2.2
	2.2 Thermal Oxidation	2.2
	2.3 Powdered Activated Carbon Treatment (PACT)	2.3
	2.4 Tertiary Sand Filtration	2.4
	2.5 Granular Activated Carbon (GAC) Treatment	2.5
	2.6 System Control Interlocks	2.5
3.0	Emergency Operations and Procedures	3.1
	3.1 Groundwater Extraction System	3.2
	3.2 Groundwater Treatment System	3.3
	3.2.1 Electrical System Back-up	3.3
	3.2.2 Fire Alarm System	3.6
	3.2.3 Fire Water System	3.7
	3.2.4 GWTS Recirculation Flow Pattern	3.10
	3.2.5 Emergency Response Procedures	3.12
	3.3 Reporting Upsets, Noncompliance and Spills	3.16

TABLE OF CONTENTS (cont'd)

		PAGE
4.0	Trouble Analysis Procedures	4.1
5.0	Operation	5.1
5.1	Digital Control System	5.1
5.2	Groundwater Extraction System (GWES)	5.6
5.3	Groundwater Treatment System	5.10
5.3.1	Diffused Air Strippers	5.10
5.3.1.1	DAS Basins	5.10
5.3.1.2	DAS Blowers	5.14
5.3.1.3	DAS Bypass Fans	5.17
5.3.2	Thermal Oxidation Unit (TOU)	5.18
5.3.2.1	TOU Exhaust Fan	5.20
5.3.2.2	Regenerative Thermal Oxidizer (RTO)	5.21
5.3.2.3	Caustic Scrubber	5.22
5.3.2.4	TOU System Start-Up	5.24
5.3.3	Powdered Activated Carbon Treatment (PACT)	5.25
5.3.3.1	First Stage Aeration and Clarification	5.26
5.3.3.1.1	Return Sludge Pumps	5.26
5.3.3.1.2	Phosphoric Acid Feed System	5.29
5.3.3.2	Second Stage Aeration and Clarification	5.32
5.3.3.2.1	Return Sludge Pumps	5.32
5.3.3.2.2	PAC Feed System	5.33
5.3.3.2.3	Polymer Feed System	5.40
5.3.3.3	Activated Sludge Blowers	5.42
5.3.4	Tertiary Filter System	5.43
5.3.5	Granular Activated Carbon System	5.48
5.3.5.1	GAC System Operation	5.48
5.3.5.2	GAC Transfer	5.54

TABLE OF CONTENTS (cont'd)

PAGE

5.3.5.3 GAC Backwash..... 5.59

5.3.5.4 Alternate GAC System Operation..... 5.61

5.3.6 NPDES Monitoring Station..... 5.63

5.3.7 Solids Handling..... 5.63

5.3.7.1 Lime Conditioning System..... 5.65

5.3.7.2 Sludge Dewatering System..... 5.66

5.3.7.2.1 Filter Press Operation..... 5.66

5.3.7.2.2 Plate Wash System..... 5.69

5.3.7.2.3 Acid Wash System..... 5.70

5.3.8 Static Aerator..... 5.71

6.0 Maintenance..... 6.1

6.1 Introduction..... 6.1

6.2 Groundwater Extraction System..... 6.2

6.2.1 Safety..... 6.2

6.2.2 GWES Maintenance..... 6.2

6.3 Groundwater Treatment System..... 6.7

6.3.1 Safety..... 6.7

6.4 Computerized Maintenance Program..... 6.7

7.0 Laboratory Testing..... 7.1

7.1 Introduction..... 7.1

7.2 Sampling and Purpose..... 7.1

7.2.1 Sample Type and Frequency..... 7.1

7.2.2 Analysis Type and Methods..... 7.3

7.2.2.1 Off-Site Laboratory Testing..... 7.3

7.2.2.2 On-Site Laboratory Testing..... 7.4

7.2.3 Purpose of Analyses..... 7.5

7.3 Quality Control Samples..... 7.7

TABLE OF CONTENTS (cont'd)

PAGE

7.4 Procedural Guidelines, Data Reduction and Validation..... 7.9

7.4.1 Procedural Guidelines..... 7.10

7.4.2 Initial Analyst Data Reduction and Review..... 7.11

7.4.3 Final Data Review..... 7.11

7.4.4 Final Report Review..... 7.11

7.5 Procedural Basis and Method References..... 7.12

8.0 Record Keeping..... 8.1

8.1 Introduction..... 8.1

8.2 Data Reporting..... 8.1

8.2.1 Minimum Data Reporting Requirements..... 8.1

8.2.2 Reporting Conventions..... 8.2

8.2.3 Report Authorization..... 8.4

8.3 Reports..... 8.4

8.3.1 Daily Log Report..... 8.4

8.3.2 Monthly Operating Report..... 8.9

8.3.3 Groundwater Monitoring Report..... 8.12

8.3.4 Monitoring Well Static Water Levels Report..... 8.17

8.4 Operating Costs..... 8.17

8.5 Reporting Forms and Log Books..... 8.22

8.5.1 Work Orders..... 8.22

8.5.2 Laboratory Bench Sheets..... 8.22

8.5.3 Visitor Sign-In Log..... 8.22

8.5.4 Daily Logs..... 8.22

8.5.5 Diskette Logs..... 8.23

8.5.6 Laboratory Log Books..... 8.23

8.5.6.1 Standard Preparation Log Books..... 8.23

8.5.6.2 Instrument Maintenance Log Book..... 8.24

8.5.6.3 Support Equipment Logs..... 8.24

8.5.6.4 Organic Sample Extraction Log Book..... 8.24

TABLE OF CONTENTS (cont'd)

PAGE

8.6 Site Specific Documents..... 8.32

8.6.1 Site Specification Manual or Permit..... 8.32

8.6.2 Procedural Manuals..... 8.32

8.7 Preservation and Storage of Records and Reports..... 8.33

8.7.1 Hard Copy Storage..... 8.33

8.7.2 Diskette Storage and Log Books..... 8.34

9.0 Regulatory Mechanisms..... 9.1

9.1 Introduction..... 9.1

9.2 Legislation..... 9.1

9.2.1 CERCLA/SARA (Groundwater)..... 9.1

9.2.2 RCRA (Groundwater, Sludge)..... 9.2

9.2.3 CWA (Wastewater)..... 9.2

9.2.4 CAA (Air)..... 9.3

9.2.5 OSHA (Safety)..... 9.3

9.3 Agencies and Contacts..... 9.4

9.4 Specific Site Reporting Requirements..... 9.4

9.4.1 Effluent Release to Surface Waters..... 9.5

9.4.2 Effluent Release to Ground..... 9.6

10.0 Staffing..... 10.1

10.1 Job Descriptions and Qualifications..... 10.1

10.1.1 Operations Manager..... 10.4

10.1.2 Laboratory Manager/Report Administrator..... 10.5

10.1.3 Operations Foreman..... 10.5

10.1.4 Chemists..... 10.6

10.1.5 Administrative Assistant..... 10.6

10.1.6 Facility Operators..... 10.7

TABLE OF CONTENTS (cont'd)

		PAGE
10.2	Training	10.8
10.2.1	Introduction	10.8
10.2.2	Minimum Requirements for Education Training	10.8
10.2.3	Operator Training	10.8
11.0	Safety	11.1

LIST OF TABLES

		PAGE
TABLE 3.1	Fire Water System Components	3.9
TABLE 4.1	GWES and GWTS Troubleshooting Guide	4.2
TABLE 5.1	DCS Screens	5.2
TABLE 5.2	Extraction Well Specifications	5.7
TABLE 5.3	TOU Alarms and System Responses	5.19
TABLE 5.4	Valve Positions for PAC Delivery	5.37
TABLE 6.1	Extraction Well PM Schedule Form	6.6
TABLE 6.2	Lighting Inventory	6.11
TABLE 6.3	Lubricant Inventory	6.12
TABLE 7.1	Sampling Plan for Ott/Story/Cordova GWTF	7.2
TABLE 7.2	Off-Site Laboratory Testing	7.3
TABLE 7.3	On-Site Laboratory Testing	7.4
TABLE 7.4	Purpose of Analyses	7.5
TABLE 7.5	Quality Control Minimum Frequency Summary	7.9
TABLE 8.1	Data Reporting	8.2
TABLE 10.1	Operating Training Manuals	10.13

LIST OF FIGURES

		PAGE
Figure 1.1	Ott/Story/Cordova Well Map	1.3
Figure 1.2	Extraction Well EW-1	1.4
Figure 1.3	Extraction Well EW-2	1.5
Figure 1.4	Extraction Well EW-3	1.6
Figure 1.5	Extraction Well EW-4	1.7
Figure 1.6	Extraction Well EW-5	1.8
Figure 1.7	Extraction Well EW-6	1.9
Figure 1.7A	Extraction Well EW-6a	1.9a
Figure 1.8	Extraction Well EW-7	1.10
Figure 1.9	Extraction Well EW-8	1.11
Figure 1.10	Extraction Well EW-9	1.12
Figure 1.10A	Extraction Well EW-10	1.12a
Figure 1.10B	Extraction Well EW-11	1.12b
Figure 1.11	PACT Multi-Purpose Tank	1.24
Figure 1.12	Hydrasand Filter Diagram	1.34
Figure 1.13	OxyCharger Model OC-184 Static Aerator	1.43
Figure 3.1	Electrical Substation Locations	3.4
Figure 3.2	One-Line Elecrical Diagram	3.5
Figure 3.3	Fire Extinguisher and Fire Alarm Station Locations	3.8
Figure 3.4	GWTS Recirculation Valving	3.11
Figure 5.1A	Process Flow Diagram	5.11

LIST OF FIGURES (cont'd)

		PAGE
Figure 5.1B	Process Flow Diagram	5.12
Figure 5.2	North Lead GAC Operations	5.52
Figure 5.3	South Lead GAC Operations	5.53
Figure 5.4	GAC North Transfer South On-Line	5.55
Figure 5.5	GAC South Transfer North On-Line	5.56
Figure 5.6	Carbon Outlet/Fill Lines Diagram	5.57
Figure 5.7	GAC Parallel Flow Diagram	5.62
Figure 6.1	Example Work Order	6.9
Figure 8.1	Ott/Story/Cordova Superfund Site Daily Log	8.6
Figure 8.2	NPDES Discharge Monitoring Report (DMR)	8.11
Figure 8.3	Quarterly Volatile Data Reporting Form	8.13
Figure 8.4	Chain-Of-Custody Record	8.15
Figure 8.5	Groundwater Sampling Field Data Form	8.16
Figure 8.6	Static Water Levels	8.18
Figure 8.7	Work Order	8.25
Figure 8.8	Daily Laboratory Report Sheet	8.26
Figure 10.1	Groundwater Treatment Facility Organizational Chart	10.2
Figure 10.2	Training Class List	10.11
Figure 10.3	Employee Training Record	10.12

1.0 GENERAL INFORMATION AND DESCRIPTION

The Ott/Story/Cordova Site is a former organic chemical manufacturing facility located in Dalton Township, Muskegon County, Michigan, about five miles north of the City of Muskegon. Through much of its history, the facility manufactured various synthetic organic intermediates, particularly those with a phosgene base. The major products were alkyl isocyanates, aromatic isocyanates, acid chlorides and carbonates. Solvents, including benzene, toluene, methanol, dimethylaniline, tetrahydrofuran and carbon tetrachloride were used in the manufacturing processes. By the mid 1970's, investigations revealed groundwater both on and off the site had been affected by chemicals from the manufacturing facility. In 1982, the United States Environmental Protection Agency (USEPA) included the site on its National Priority List (NPL) as an uncontrolled hazardous waste site under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) because of the release of hazardous substances from the site. A groundwater extraction network and a groundwater treatment facility have been constructed to remediate the aquifer to standards acceptable to the U.S. Army Corps of Engineers (USACE), the USEPA and the State of Michigan Department of Environmental Quality (MDEQ).

This section describes the purpose, physical and function characteristics, and operational capabilities of the groundwater extraction and treatment systems components. It includes descriptions of process flow patterns and a summary of operation and managerial responsibilities.

1.1 GROUNDWATER EXTRACTION SYSTEM (GWES)

The design groundwater extraction system (GWES) consists of eleven wells that pump contaminated groundwater to the treatment system. The purpose of the GWES is two-fold; to extract contaminated water from the affected aquifer and to prevent the spread of pollutants beyond the boundary of the extraction well network. Extraction wells (EWs) 8, 10 and 11 are located near the treatment facility in the aquifer with the highest reported level of contaminants. Adjacent to EW-8 is EW-9, which pumps groundwater from a second, deeper aquifer determined to be less impacted by pollutants.

Remedial studies have concluded that the affected aquifer flow and thus the migration of contaminants from the site are in a southeasterly direction. A line of extraction wells (EWs 1 through 7) has been installed approximately one-half mile from the Ott/Story/Cordova facility, designed to intercept the aquifer and prevent contaminants from migrating beyond the containment area.

Figure 1.1 is a map showing the locations of the extraction wells in relation to the Ott/Story/Cordova manufacturing facility and the GWTS. Included in this illustration are numerous monitoring wells, many of which are sampled quarterly to assess the progress of the remediation goals previously described. Figures 1.2 – 1.10B are drawings of the extraction well installations, and include depths, screen lengths, water levels and elevations relative to sea level.

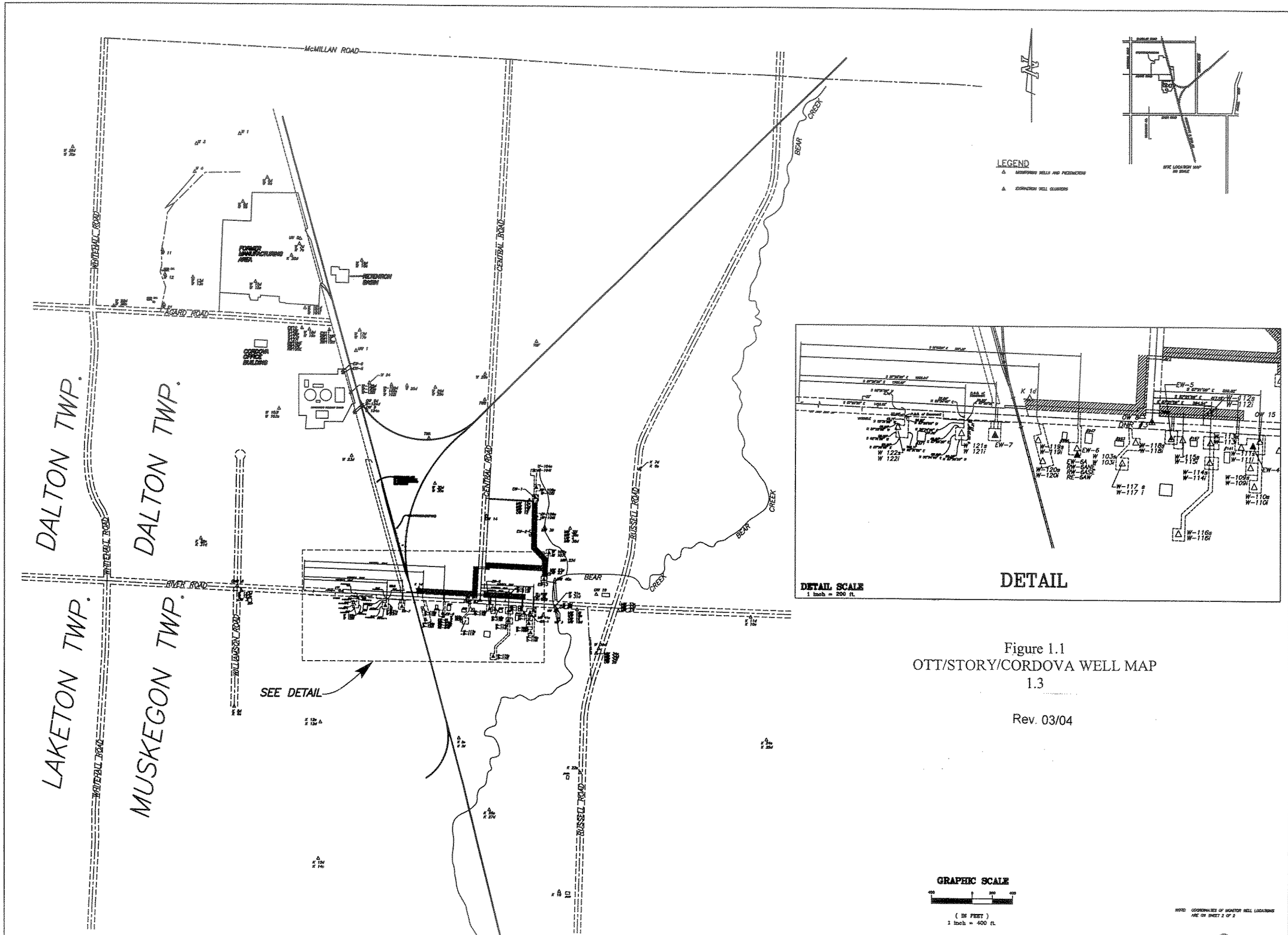


Figure 1.1
OTT/STORY/CORDOVA WELL MAP
1.3

Rev. 03/04

WESTSHORE CONSULTING
Engineers ■ Scientists ■ Surveyors ■ Planners
2554 Beck Creek Road – Muskegon, Mich. 49444
PH. (231) 777-3447 FAX (231) 773-3453

PROJECT NAME:
OTT STORY CORDOVA
GROUNDWATER TREATMENT SYSTEM
MUSKEGON, MICHIGAN

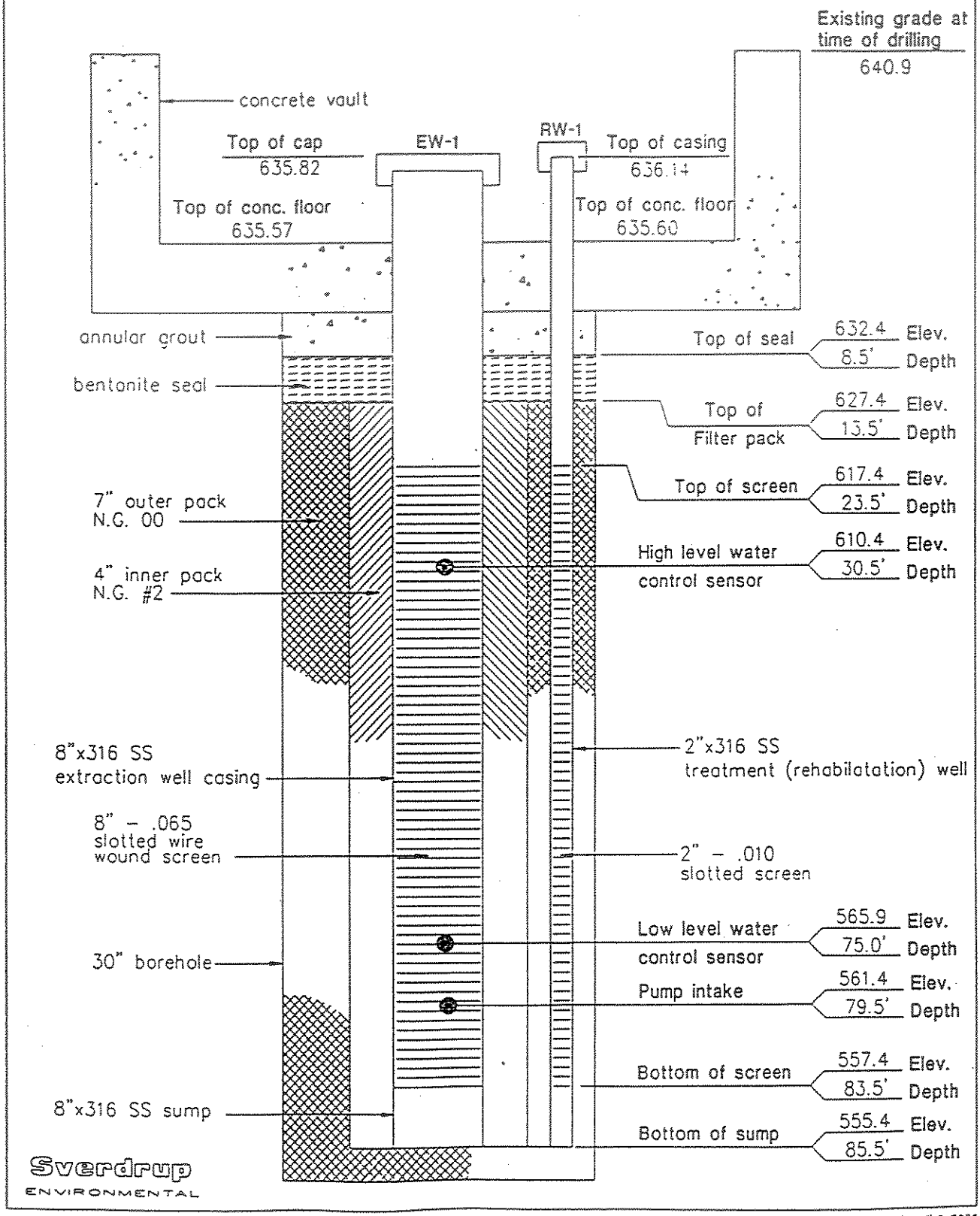
REVISIONS	
DATE	ISSUED FOR
10/23/01	UPDATE WELL CLUSTERS EW3A, EW10, EW11

ISSUED: 11-20-99
APR:
CKD:
DRN: PB
FIELD BOOK
DRAWING TITLE
WELL LOCATION AS-BUILTS

SHEET 1 OF 2
WESTSHORE JOB #
547-6-AB-1

FIGURE 1.2
EXTRACTION WELL EW-1

EXTRACTION WELL CONSTRUCTION		PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-1/RW-1
DRILLING CONTRACTOR: CDS, Inc.		COORDS.(IN FT): 661259.99 N, 1491037.65 E/661259.08 N, 1491037.06 E		
BEGUN: 6-12-95	SUPERVISOR: D. Cika	WELL SITE: N. of EW-2	WATER LEVEL:	TOTAL DEPTH:
FINISHED 6-15-95	DRILLER: D. Balhowski		617.4	85.5'

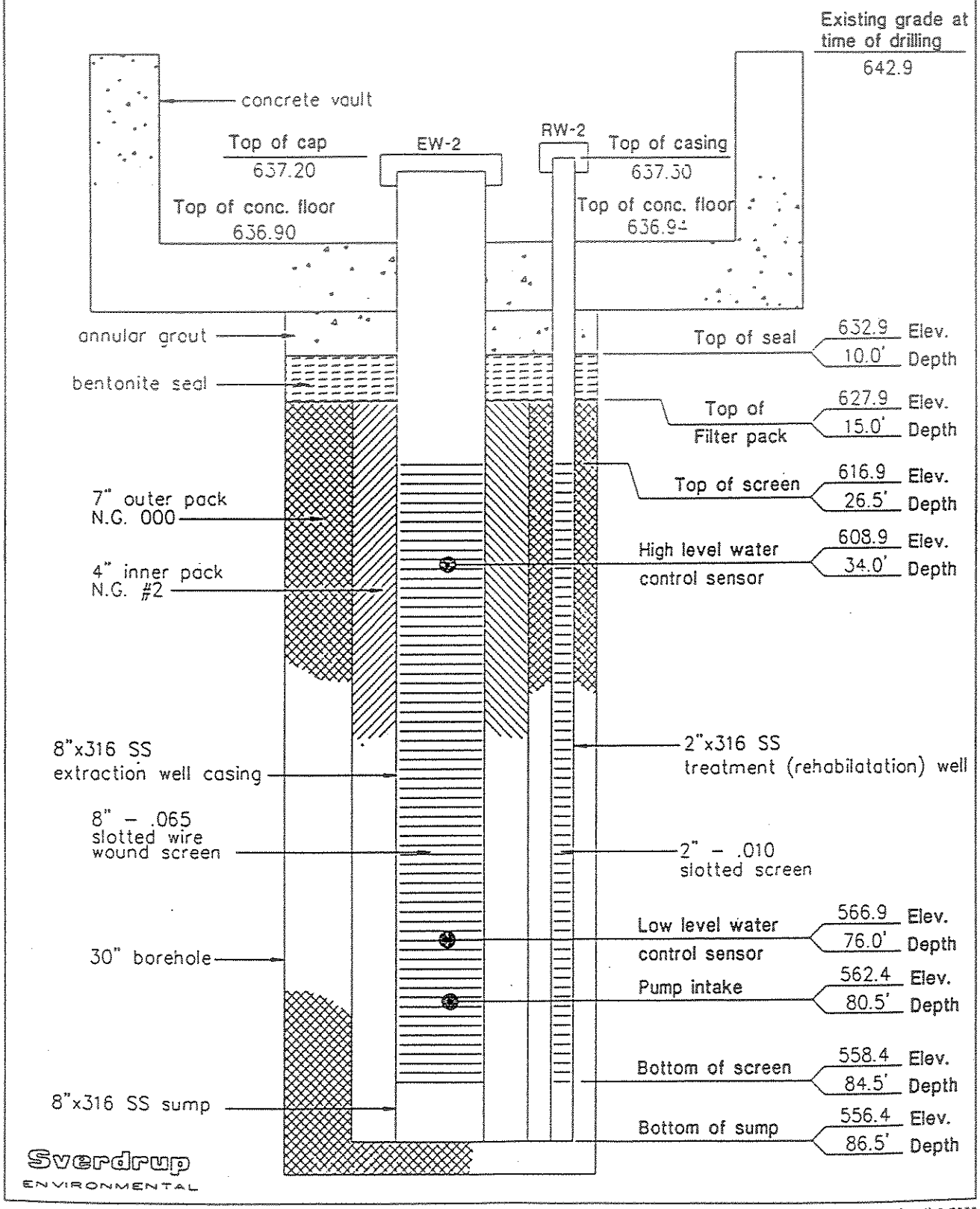


N:\511001\SVE\SVE036

FIGURE 1.3

EXTRACTION WELL EW-2

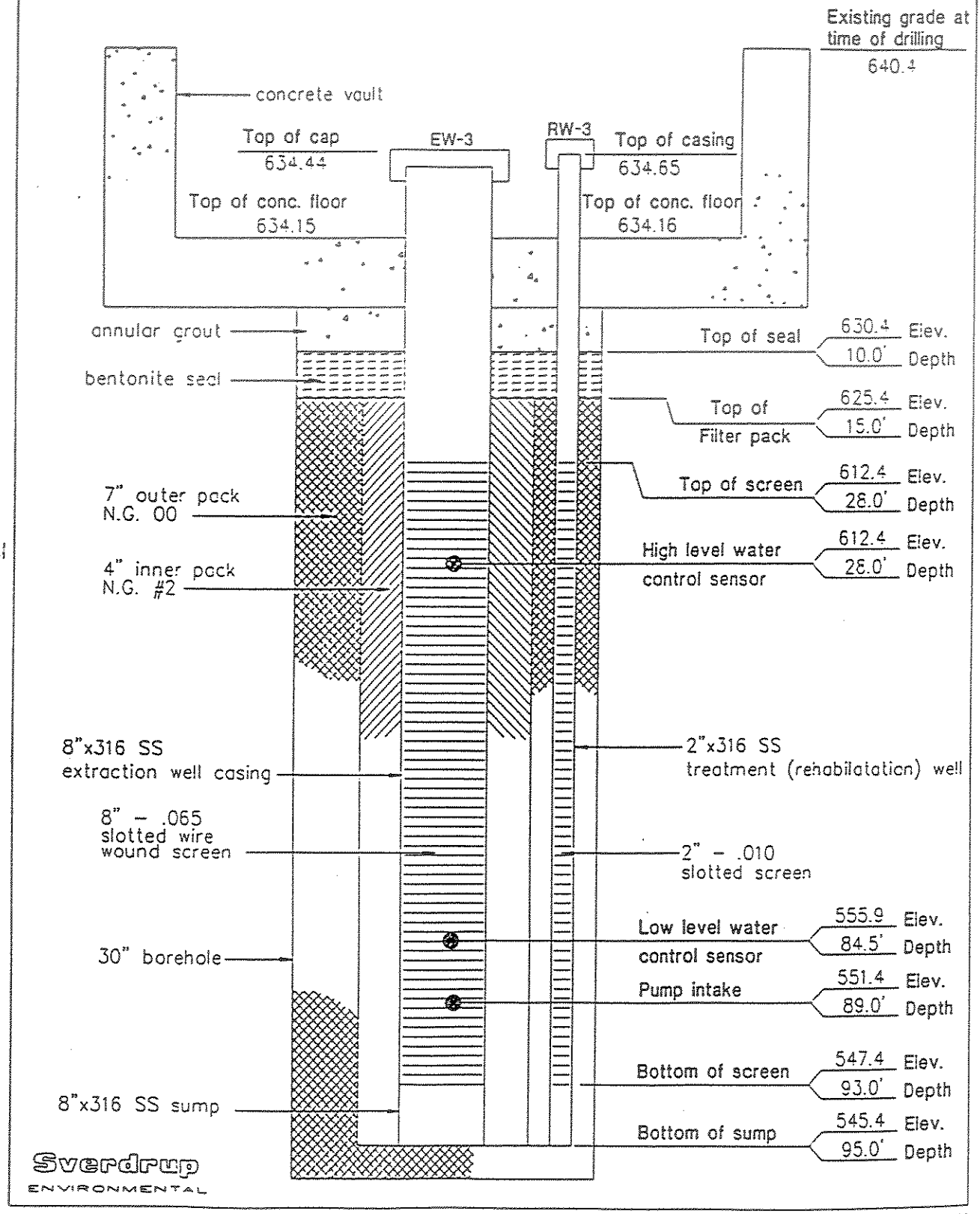
EXTRACTION WELL CONSTRUCTION	PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-2/RW-2
DRILLING CONTRACTOR: CDS, Inc.	COORDS.(IN FT): 660909.69 N 1491003.20 E/660909.52 N 1491002.27 E		
BEGUN: 6-14-95	SUPERVISOR: D. Cika	WELL SITE: S. of EW-1	WATER LEVEL: 615.9 / TOTAL DEPTH: 86.5'
FINISHED 6-20-95	DRILLER: D. Balhowski		



N:\511001\SVE\SVE036

FIGURE 1.4
EXTRACTION WELL EW-3

EXTRACTION WELL CONSTRUCTION	PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-3/RW-3
DRILLING CONTRACTOR: CDS, Inc.	COORDS.(IN FT): 660455.23 N, 1491122.34 E/660455.91 N, 1491123.14 E		
BEGUN: 7-17-95 / SUPERVISOR: D. Cika	WELL SITE: S. of EW-2	WATER LEVEL:	TOTAL DEPTH:
FINISHED 7-19-95 / DRILLER: D. Bajhowski		612.4	95.0'

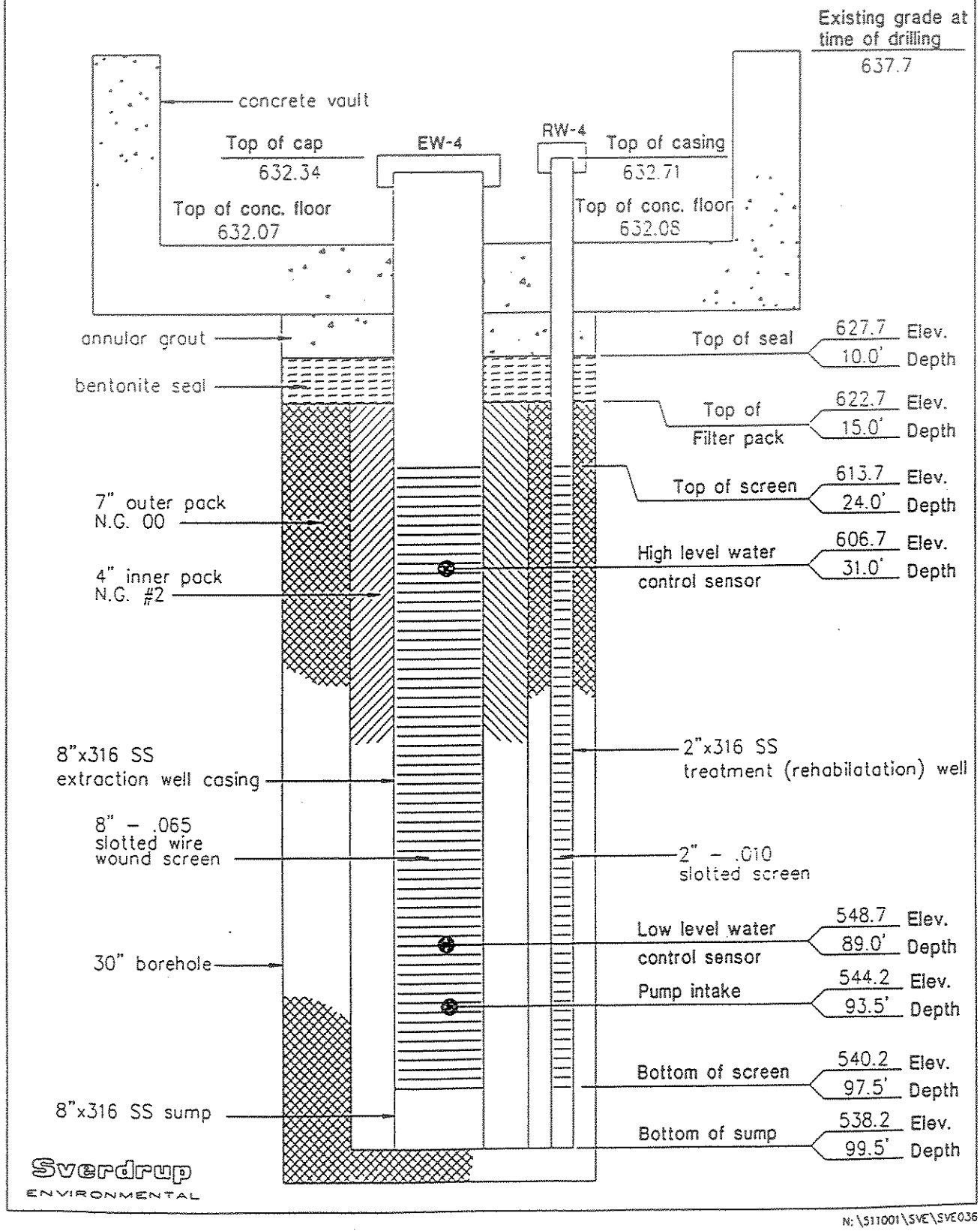


N:\511001\SVE\SVE036

FIGURE 1.5
EXTRACTION WELL EW-4

EXTRACTION WELL CONSTRUCTION	PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-4/RW-4
DRILLING CONTRACTOR: CDS, Inc.	COORDS.(IN FT): 660131.16 N, 1490986.72 E/660130.60N, 1490986.19E		

BEGUN: 6-28-95	SUPERVISOR: D. Cika	WELL SITE: S. of EW-4, E. of EW-5	WATER LEVEL:	TOTAL DEPTH:
FINISHED 7-5-95	DRILLER: D. Balhowski		613.7	99.5'



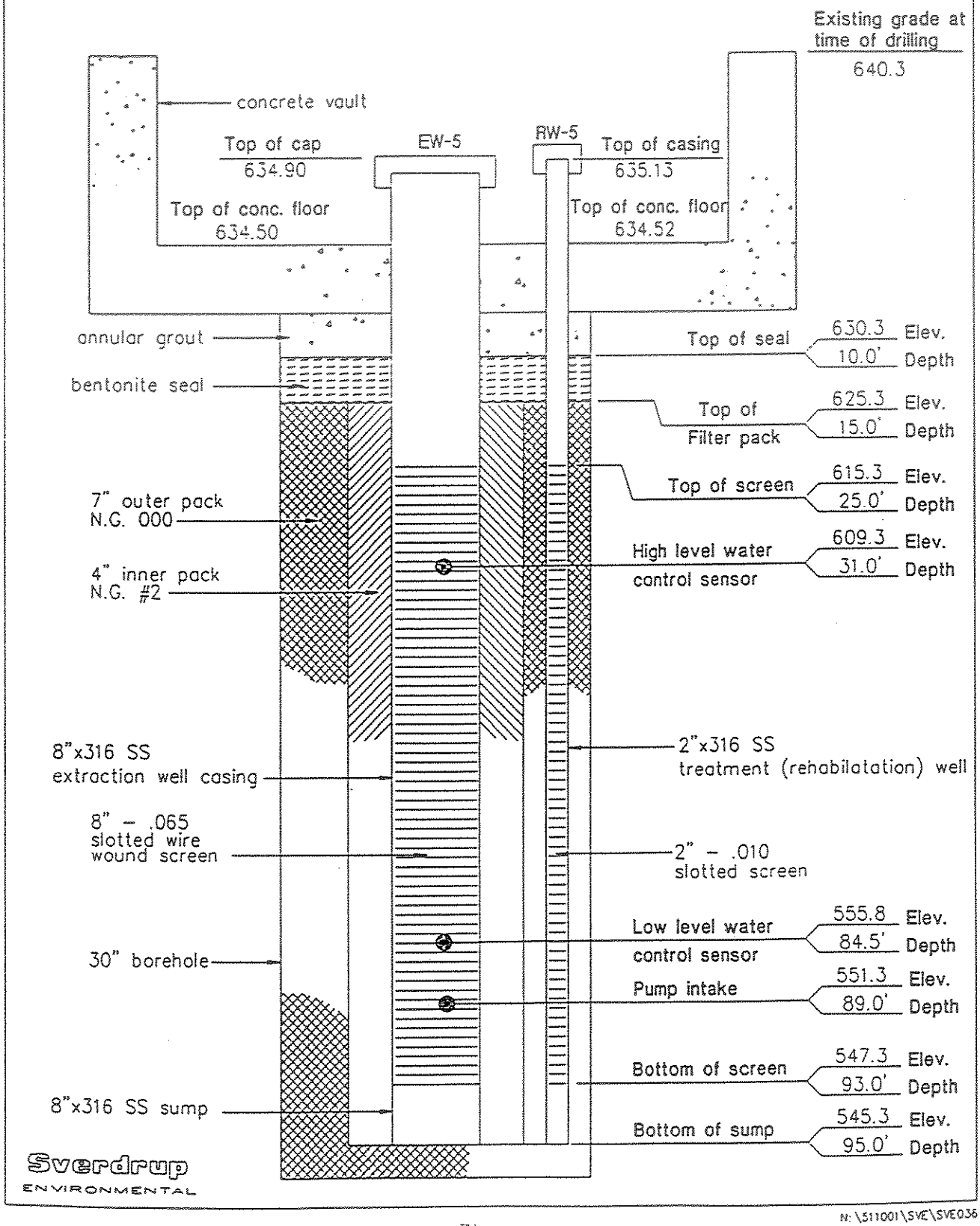
N:\511001\SVE\SVE036

FIGURE 1.6

EXTRACTION WELL EW-5

EXTRACTION WELL CONSTRUCTION	PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-5/RW-5
DRILLING CONTRACTOR: CDS, Inc.	COORDS.(IN FT): 660165.63 N, 1490581.03 E/660165.18 N, 1490581.65 E		

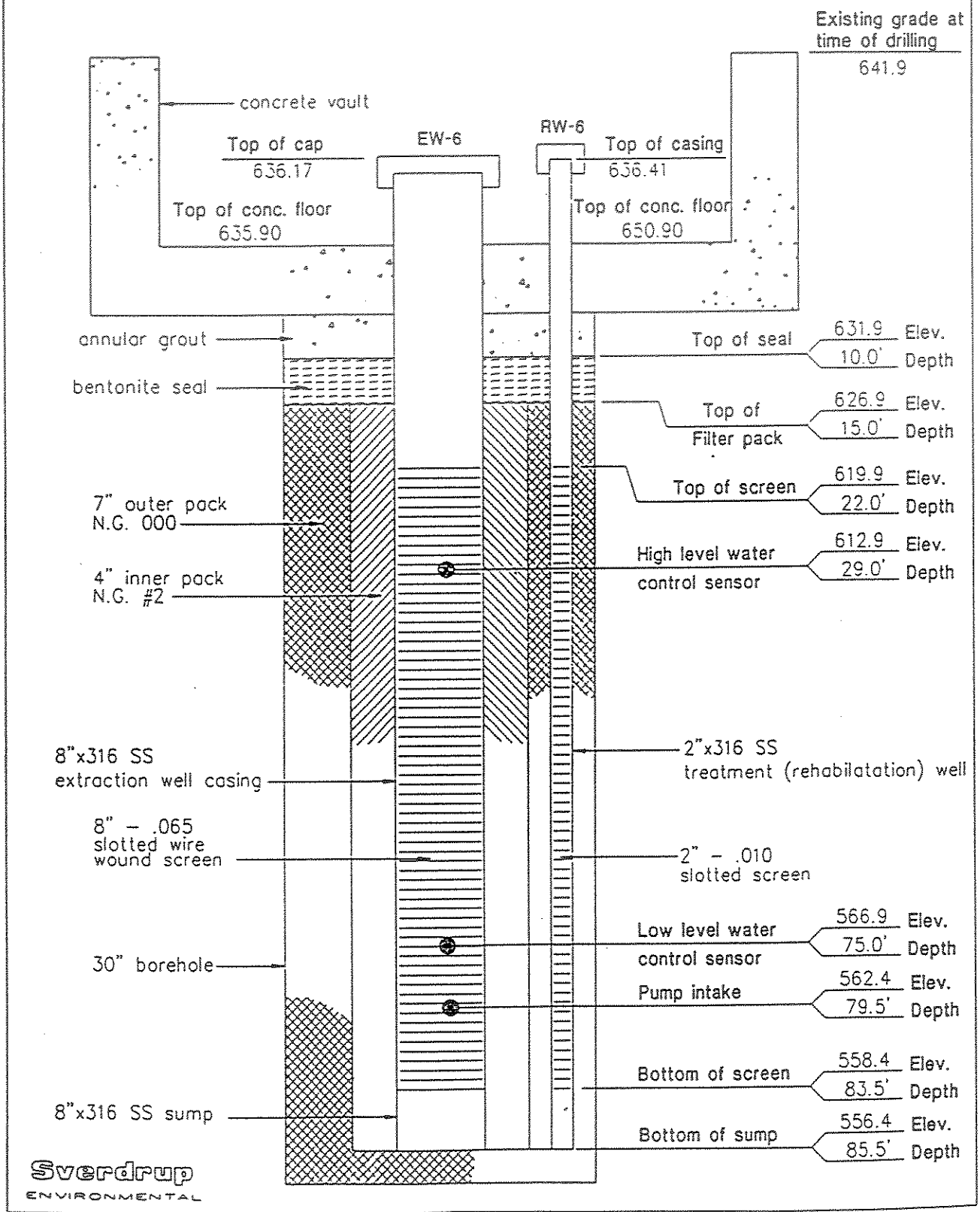
BEGUN: 6-22-95	SUPERVISOR: D. Cika	WELL SITE: W. of EW-4, E. of EW-6	WATER LEVEL:	TOTAL DEPTH:
FINISHED 6-29-95	DRILLER: D. Balhowski		616.3	95.0'



N:\511001\SVE\SVE036

FIGURE 1.7
EXTRACTION WELL EW-6

EXTRACTION WELL CONSTRUCTION		PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-6/RW-6
DRILLING CONTRACTOR: CDS, Inc.		COORDS.(IN FT): 660116.24 N, 1490118.99 E/660117.07 N, 1490118.58 E		
BEGUN: 6-19-95	SUPERVISOR: D. Cika	WELL SITE: W. of EW-5	WATER LEVEL:	TOTAL DEPTH:
FINISHED 6-23-95	DRILLER: D. Balhowski		619.9	85.5



N:\511001\SVE\SVE036

FIGURE 1.7A
EXTRACTION WELL EW-6A

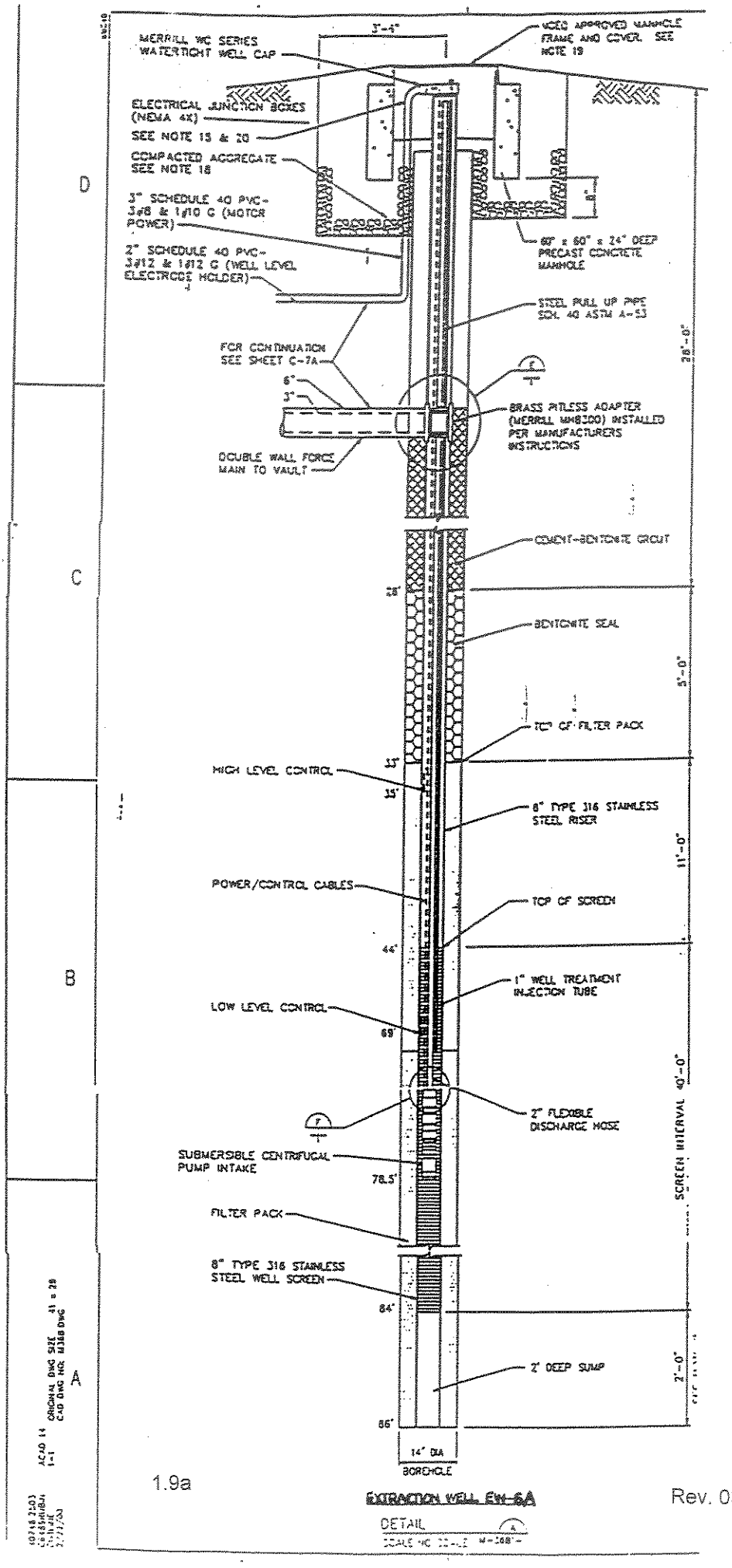
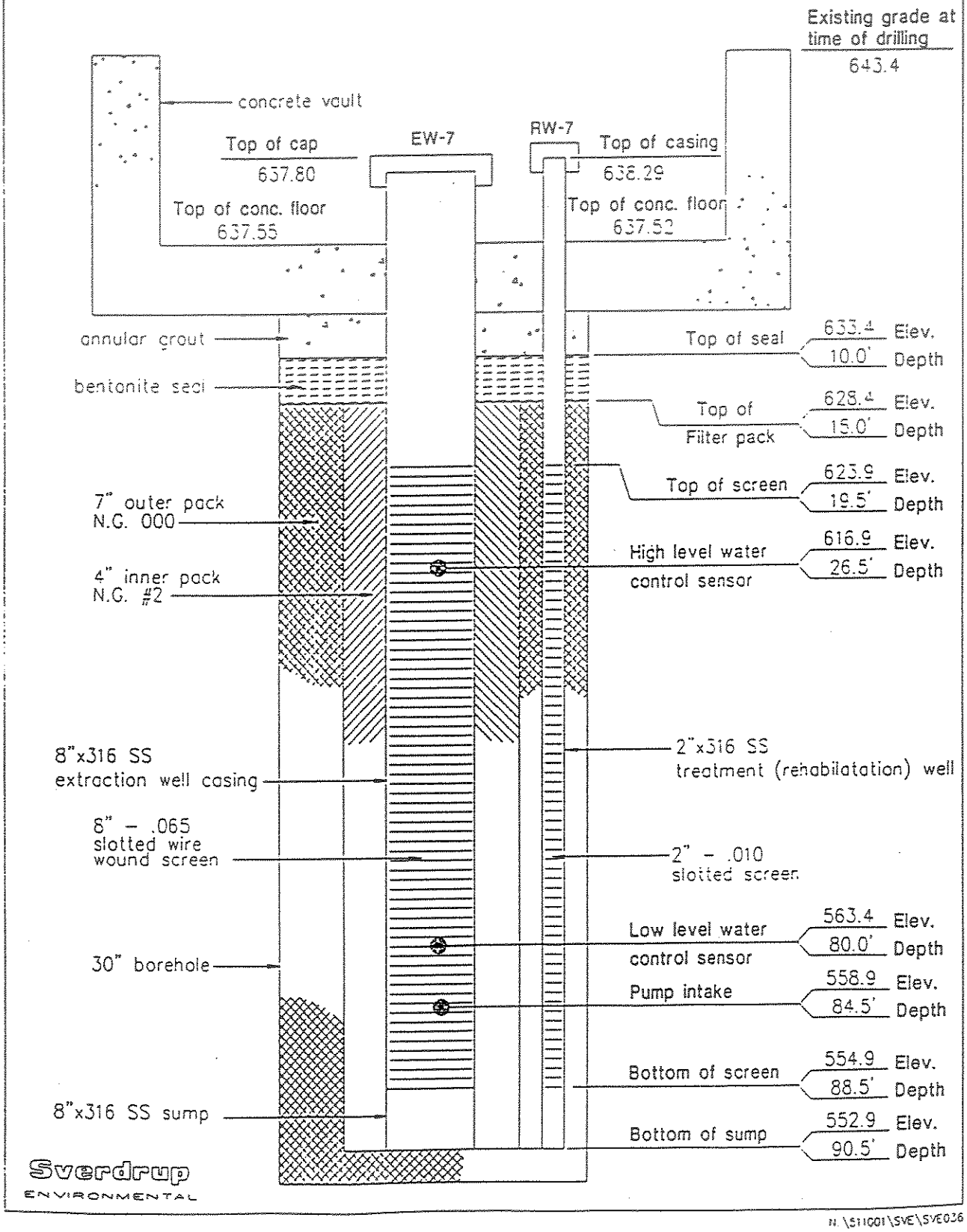


FIGURE 1.8

EXTRACTION WELL EW-7

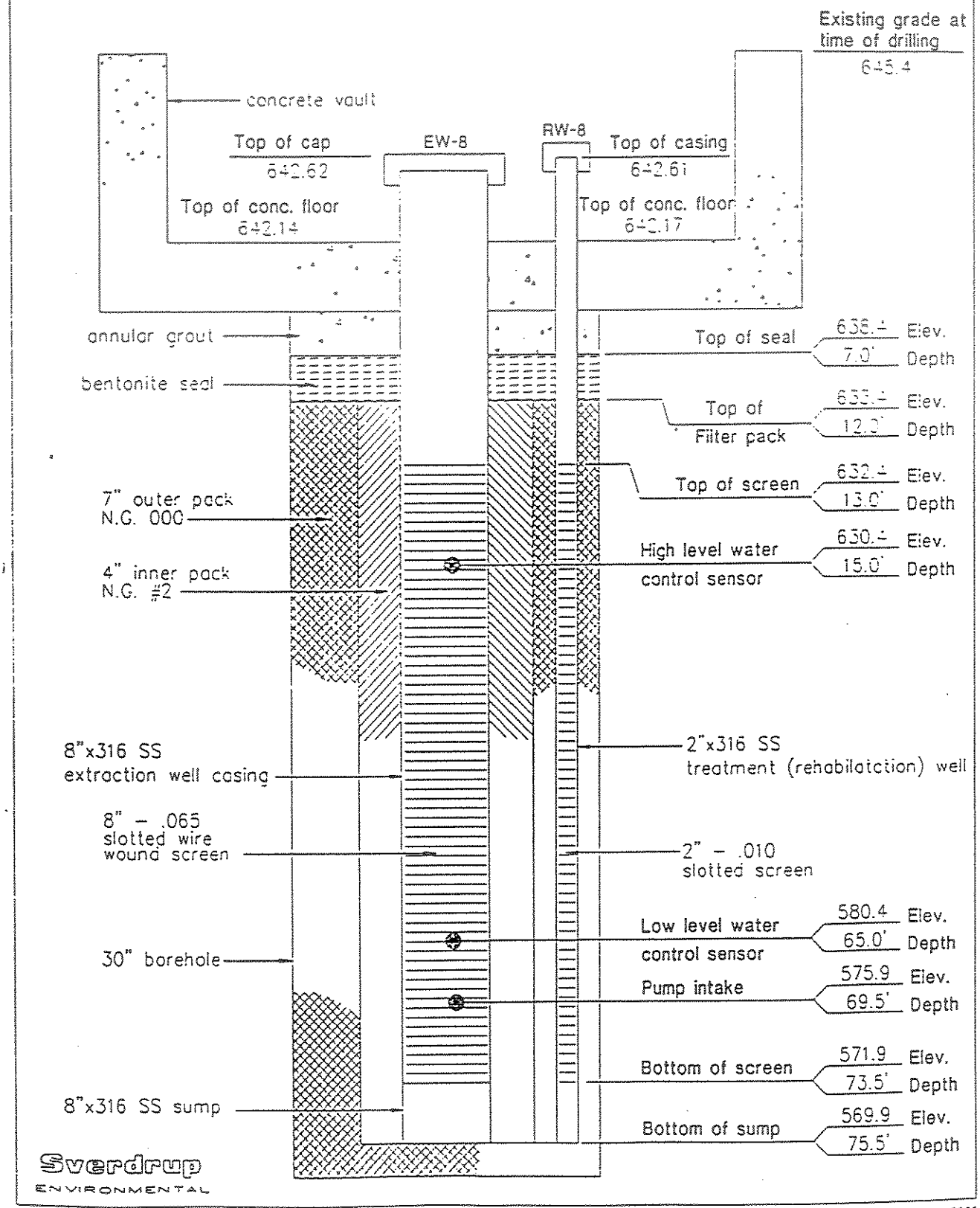
EXTRACTION WELL CONSTRUCTION		PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-7/RW-7
DRILLING CONTRACTOR: CDS, Inc.		COORDS.(IN FT): 660179.85 N, 1489711.16 E/ 660180.26 N, 1489710.35 E		
BEGUN: 7-5-95	SUPERVISOR: D. Cika	WELL SITE: W. of EW-6	WATER LEVEL:	TOTAL DEPTH:
FINISHED 7-10-95	DRILLER: D. Balhowski		623.9	90.5



N:\511001\SVE\SVE036

FIGURE 1.9
EXTRACTION WELL EW-8

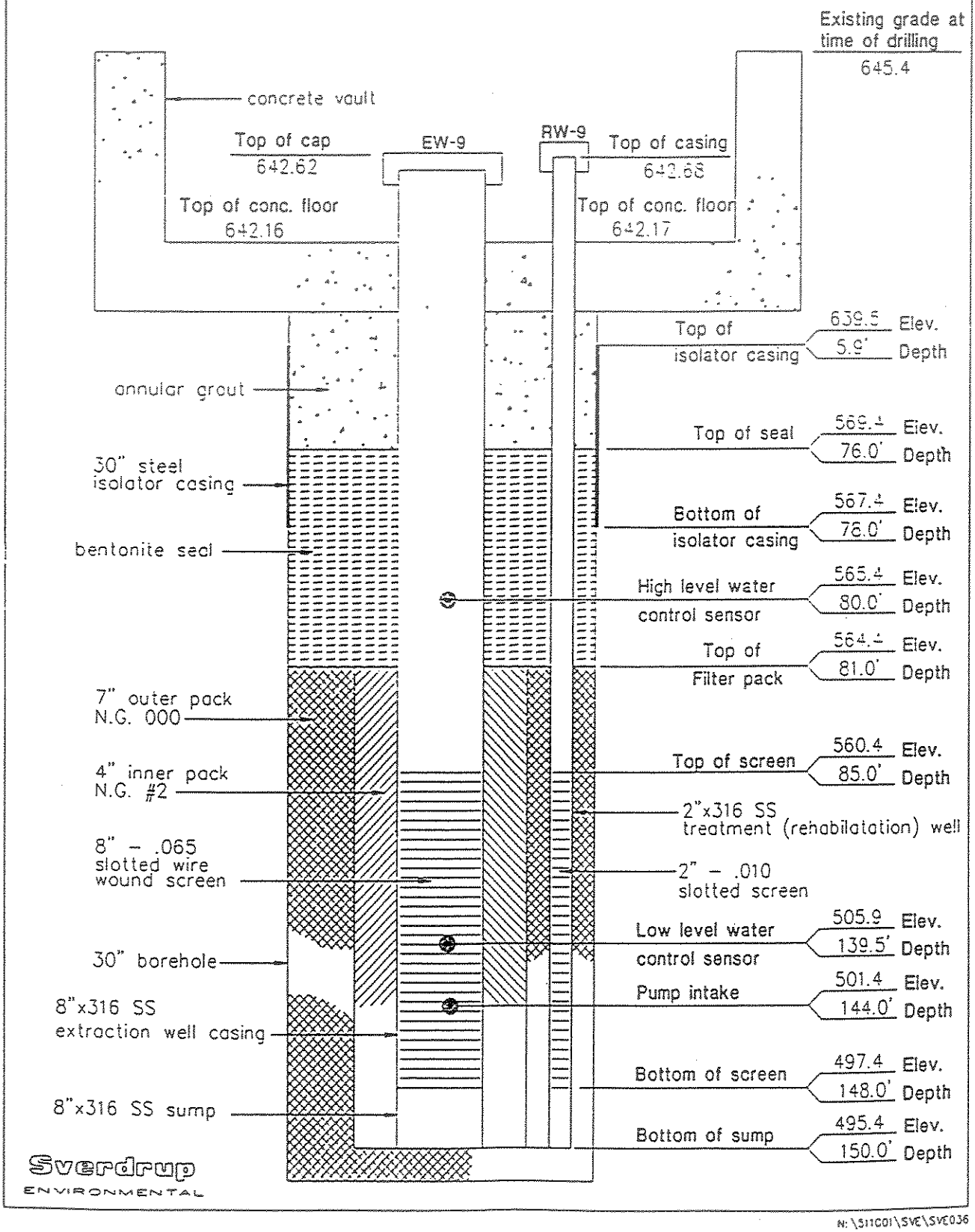
EXTRACTION WELL CONSTRUCTION	PROJECT: OTT/STORY; JOB NO. 102		WELL NO. EW-8/RW-8	
DRILLING CONTRACTOR: CDS, Inc.	COORDS.(IN FT): 662494.24 N, 1489124.51 E/ 662494.91 N, 1489125.42 E			
BEGUN: 7-20-95	SUPERVISOR: D. Cika	WELL SITE: N.E. OF GWTF	WATER LEVEL:	TOTAL DEPTH:
FINISHED 7-21-95	DRILLER: D. Balhowski		637.4	75.5



N:\511001\SVE\SVE036

FIGURE 1.10
EXTRACTION WELL EW-9

EXTRACTION WELL CONSTRUCTION		PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-9/RW-9
DRILLING CONTRACTOR: CDS, Inc.		COORDS.(IN FT):662476.90 N, 1489125.47 E/662477.54 N, 1489124.96 E		
BEGUN: 7-26-95	SUPERVISOR: D. Cika	WELL SITE: N.E. of GWTP	WATER LEVEL:	TOTAL DEPTH:
FINISHED 8-3-95	DRILLER: D. Balhowski		(ARTESIAN)	150.0'



N:\511C01\SVE\SVE036

FIGURE 1.10A
EXTRACTION WELL EW-10

EXTRACTION WELL CONSTRUCTION	PROJECT: OTT/STORY	JOB NO. 102	WELL NO. EW-10
DRILLING CONTRACTOR: STEARNS DRILLING	COORDS.(IN FT): 662925.06N, 1488747.32 E		

BEGUN: 8/4/99	SUPERVISOR: D. Cika	WELL SITE: S. OF AGARD	WATER LEVEL:	TOTAL DEPTH:
FINISHED: 8/4/99	DRILLER: B. Grahm		638.3	75.0

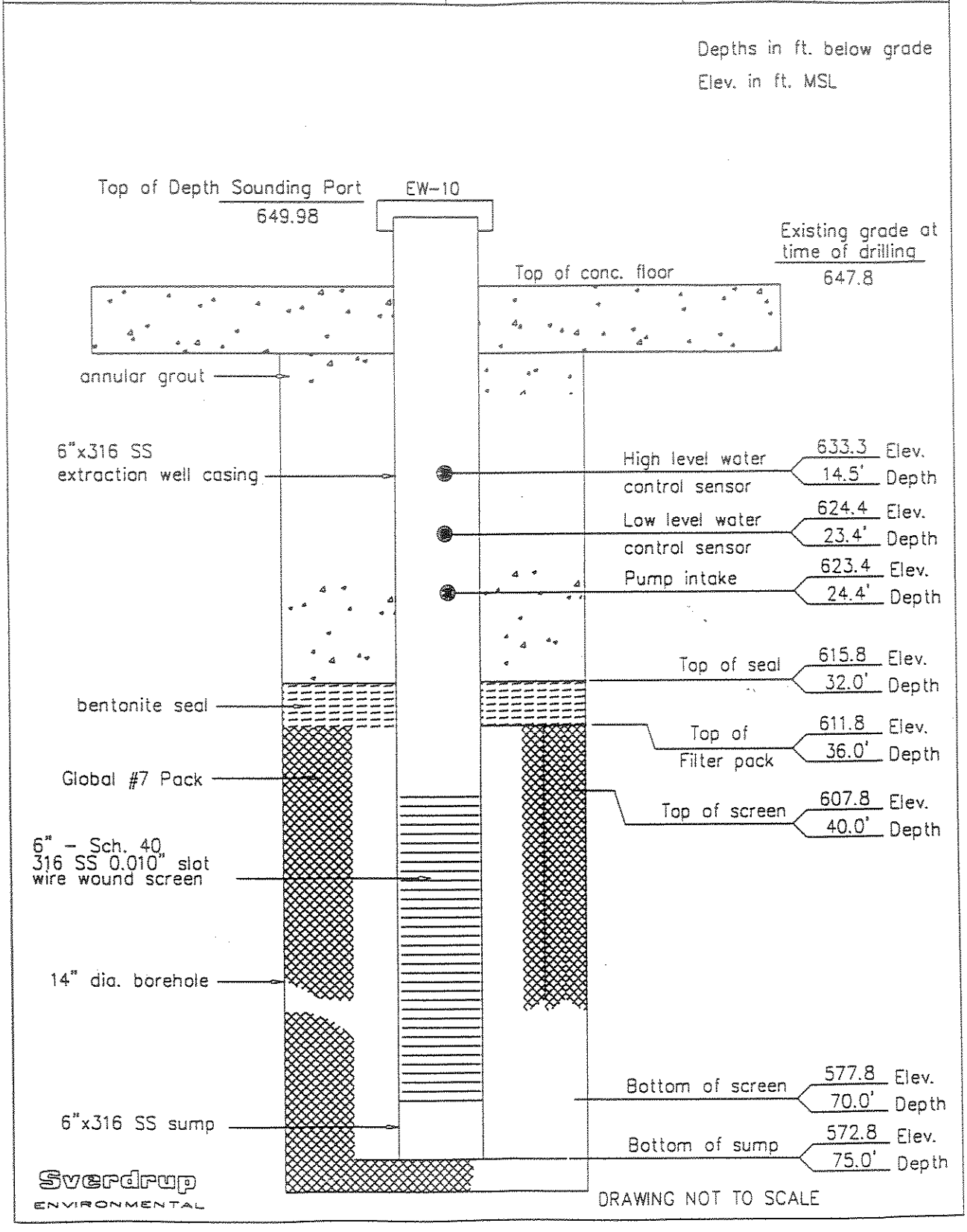


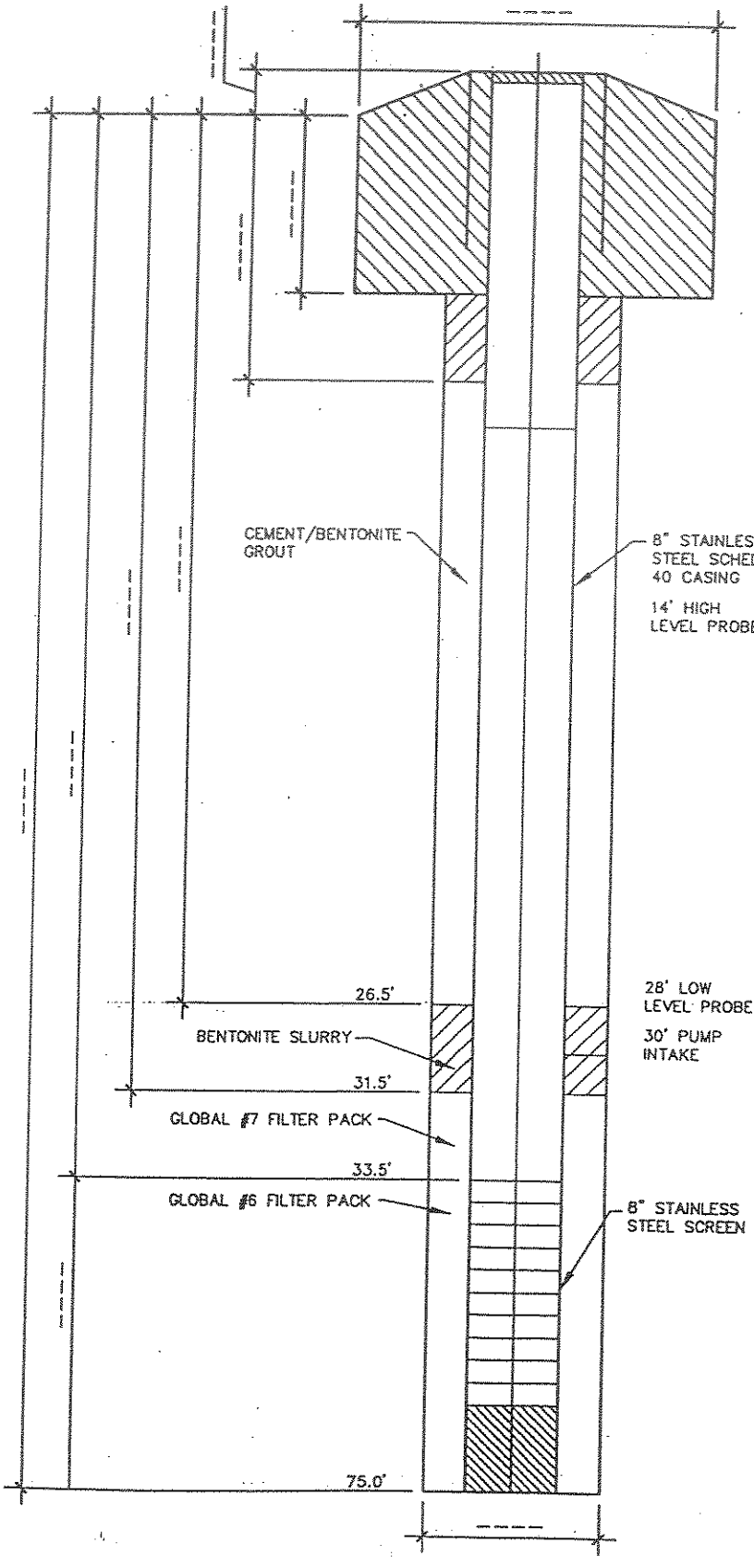
Figure 1.10B EXTRACTION WELL EW-11

T.O.C. ELEV.: 646.88 DATE: 10-19-01 SITE: OTT/STORY/CORDOVA WELL NO.: EW-11

GND. ELEV.: STEARNS DRILLING DATE: CONTRACTOR: STEARNS DRILLING BORING NO.:

STATIC H2O LEVEL: 637.77 DATE: 9-28-01 LOCATION: N 662,889.55 E 1,489,011.32 DATE: 6/11/01-6/21/01

PROJECT NO: G00432F



GUARD POSTS No. Type

PROTECTIVE CASING Type

Diameter Length

Vented Key No.

PLUG Type Vented

CONCRETE COLLAR Quantity

Material

Manufacturer

UPPER SEAL Material

Quantity Hydrated Time/Vol.

Manufacturer

JOINTS Type

Joint Compound

Manufacturer

CASING Material STAINLESS STEEL SCHEDULE 40

O.D. I.D. 8 INCH

Length 0-40.0'

Manufacturer

GROUT Material CEMENT/BENTONITE

Quantity

Total Gallons

Manufacturer

LOWER SEAL Material BENTONITE SLURRY

Quantity Hydrated Time/Vol. 30 MINS.

Manufacturer

SCREEN Material TYPE 316 STAINLESS STEEL

Slot Size 20 (.020) Slots/Inch

O.D. I.D. 8 INCH Length 30'

Manufacturer JOHNSON

SCREENED INTERVAL 40.0'-70.0'

FILTER PACK

Type 31.5'-33.5' GLOBAL #7
33.5'-75.0' GLOBAL #6

Volume

Source

CAP Type

Length

BACKFILL Material

Top

Rev. 03/04

PLOT INFO: (00432F\Cd\Z002004432F.DWG DATE: 07/27/2001 TIME: 1:58 PM USER: CDA

The extraction wells pump groundwater into a collection system consisting of high density polyethylene (HDPE) double-walled pipes through which the water is delivered to the treatment facility. Flow through the piping results from pressure generated by the extraction well pumps. The collection system includes valving and headers that ultimately result in flows from the seven remote extraction wells being delivered to the treatment facility via two 10-inch diameter force mains, flows from EWs-8 and 9 through a third force main, and flows from EWs-10 and 11 through a fourth influent line. All groundwater flows are combined in a single line prior to entering the GWTS. The double-walled design of the collection system piping allows the space between the force main and the surrounding environment to be monitored for any leaks that may result in the release of contaminated groundwater.

Except for EWs-10 and 11, each extraction well installation includes a concrete vault constructed below grade in such a manner that the top of the vault is flush with the ground. Except for EW-6a, the well riser or discharge line enters the vault vertically through the floor, then runs horizontally along two walls before exiting the vault through a side wall. For EW-6a, the well discharge enters the vault through the side wall and connects to the horizontal piping there. A flow meter registering both the instantaneous flow rate and totalized flow reading, a pressure gauge, a motor operated valve (MOV), a check valve, and a manual ball valve are all installed in this horizontal run of pipe. Programmable logic controllers (PLCs) located in nearby control cabinets (CC-1 for EWs-1 through 3, CC-2 for EWs-4 through 7, and CC-301 for EWs-8 and 9) are used to set the desired flow rates from each individual well. The PLCs control flows by opening

or closing the MOVs on the well discharge lines. Hand/Off/Auto switches and electrical disconnects are mounted inside the vaults, while circuit breakers for the remote wells are located in their respective control cabinets.

EWs-10 and 11 include the typical valving, flow meter, pressure gauge and MOV found in the other nine extraction wells, but these components are all installed above ground level in a secured, insulated structure. An electric heater is provided to prevent freezing during cold weather, and the programmable logic controller is in an electrical box inside the enclosure rather than in a separate control cabinet. "Hand/Off/Auto" switches and electrical disconnects are mounted inside the structures and the circuit breakers for EWs-10 and 11 are on panel MCC-102 in the Blower Building.

Two 45 KW LP gas-powered generator systems manufactured by Michigan CAT have been provided to provide electricity to operate EWs 1-7 if utility power is lost. The generators are located next to Control Cabinets CC-1 and CC-2 and are secured within lockable chain-link fencing that also encloses the control cabinets. Each system supplies 480 volt 200 amp service and requires a manual transfer in order to deliver the generated electricity to the extraction well motors. Each system includes a weatherproof enclosure, an Olympian 4001E Control and Alarm Panel, a coolant heater and battery charger. Refer to the Generator Set Engineering Submittal filed in the Operator Office for more information regarding the standby generators.

1.2 GROUNDWATER TREATMENT SYSTEM (GWTS)

The Groundwater Treatment System (GWTS) consists of various processes that remove contaminants from the groundwater delivered by the extraction wells to a final effluent quality consistent with levels required by the facility's National Pollutant Discharge Elimination System (NPDES) permit. The GWTS design also includes components that destroy volatile contaminants in off-gases generated by water treatment processes prior to their release to the atmosphere.

GWTS components include two diffused air strippers (DAS), two biological and chemical treatment units using the powdered activated carbon treatment (PACT) process, three tertiary sand filters, four granular activated carbon (GAC) vessels, and a solids residuals treatment system comprised of three filter presses. A thermal oxidation unit (TOU) is provided to treat contaminants present in the DAS off-gas. A site diagram showing the GWTS buildings and structures is provided in the construction as-built drawings. In addition, a poster-sized illustration of the GWTS components and explanations of their functions has been prepared and is kept in the operator office. The poster is frequently used during operator training and during facility tours to describe treatment processes.

The GWTS is located just south of the former Ott/Story/Cordova manufacturing facility as shown in Figure 1.1. Entry to the facility is south off of Agard Road. The entire

treatment facility grounds are surrounded by a six foot high chain link fence. Main entry into the facility is through a motorized gate which requires password code entry to open, or the gate can be opened remotely by operating staff inside the front office building after authorized entry has been confirmed. The front office and laboratory, located in the Groundwater Treatment Building, are also protected by an intrusion alarm system disarmed by entering an authorization code on the panel located just inside the front door. Unauthorized entry detected by the intrusion alarm system will notify a contracted security company that will initiate a response by the local police department.

The GWTS consists of several structures and buildings, including:

- DAS tanks located inside a containment wall that captures leaks from influent piping and DAS overflows
- The Blower Building housing the low pressure air compressors that provide air for both the PACT aeration tanks and the DAS tanks
- The TOU Building where the thermal oxidation unit controls and caustic solution storage tank are located
- Two domed PACT systems containing aeration tanks and clarifiers
- The Sludge Pumping Building that encloses the sludge pumps and controllers
- The Sludge Treatment Building (STB) that houses the filter presses and pumps, as well as some chemical treatment systems
- The Firewater Building that contains an auxiliary pump to provide water for fire-fighting as well as a boiler and water recirculation equipment to prevent stored firewater from freezing in cold weather

- The Groundwater Treatment Building (GTB) where the tertiary sand filters, granular activated carbon vessels, chemical feed systems, operator offices and the facility laboratory are located.

Description summaries of individual GWTS process components are provided in the following subsections.

1.2.1 Diffused Air Strippers (DAS)

The function of the diffused air stripper (DAS) process is to remove volatile contaminants present in the groundwater by converting them to their gaseous state and carrying them off in a stream of air. This is accomplished by bubbling air through tanks containing the contaminated water to extract these pollutants. Groundwater from the extraction wells enters a flow splitter located between the two DAS basins. Water overflows concrete weirs in the flow splitter and flows into the DAS tanks through pipes connected to the tanks below the water level maintained in the strippers. Compressed air is injected near the bottoms of the tanks through coarse bubble diffusers, providing a violent turbulence as the air bubbles rise to the top of the basins. Effluent from the DAS basins flows by gravity to subsequent treatment processes while contaminated off-gases from the top of the DAS tanks and the enclosed splitter box are drawn under vacuum into the thermal oxidation unit (TOU).

1.2.1.1 Diffused Air Stripper (DAS) Basins

The diffused air stripper (DAS) basins, designated DAS-101 and DAS-102, are cylindrical 31-foot diameter carbon steel tanks manufactured by the Pittsburgh Tank Company. Stainless steel coarse bubble diffusers manufactured by Aeromix Systems, Inc. are mounted at the bottom of the tanks. The diffusers are diamond-shaped devices that allow compressed air supplied by the DAS blowers to escape from tiny outlets along the flat sides of the diffusers. Air bubbles escaping from the diffusers rise up through water in the DAS basins, carrying volatile contaminants to the air space at the top of the tanks.

1.2.1.2 Diffused Air Stripper Blowers (DB-120, 121, 122)

Three DAS blowers have been installed that draw air from inside the domed powdered activated carbon treatment (PACT) structures and deliver it to the DAS diffusers at a design pressure of 11 pounds per square inch (psi). The blowers, located in the Blower Building next to and just south of the DAS basins, were manufactured by Ingersoll-Rand, are driven by 400 horsepower (hp) electric motors, and are capable of supplying up to 5500 cubic feet per minute (cfm) of compressed air.

1.2.1.3 DAS Bypass Fans (DF-130,131,132)

Three DAS bypass fans have been provided that also draw air from the domed PACT structures. These fans are located outdoors, south of the Blower Building, and are smaller

than the DAS blowers with a pumping capacity of about 1500 cfm each. Unlike the DAS blowers, the bypass fans do not direct air through the stripper diffusers, but rather to the air space above the water level in the DAS tanks. The purpose of these blowers is to increase the capacity to remove air from the PACT structures and ultimately direct it to the TOU, preventing the release of contaminants to the atmosphere.

1.2.2 Thermal Oxidation Unit (TOU)

The thermal oxidation unit (TOU) consists of the following components that collectively function to destroy volatile contaminants present in the DAS off-gas, then scrub the exhaust with a caustic solution to remove combustion byproducts prior to its release to the atmosphere:

1.2.2.1 TOU Exhaust Fan

The main exhaust fan is located at the end of the TOU system. It provides the air flow necessary to induce a vacuum throughout the TOU process all the way back to the DAS vents. To prevent contaminants in the stripper off-gas from escaping to the atmosphere, the TOU exhaust fan flow rate must always exceed the combined air flow rates of the DAS blowers and bypass fans that blow air into the DAS basins. A manometer located in the TOU inlet duct monitors the vacuum in that duct and sends a signal to a controller that uses a variable frequency drive (VFD) unit to adjust the exhaust fan motor speed and maintain a constant inlet vacuum. If the vacuum in the inlet duct increases, the fan speed

decreases. Conversely, if the inlet duct vacuum decreases, fan speed is increased by the controller. This system provides control over the volume of air drawn from the DAS basins to both ensure that no contaminated air is released to the atmosphere, and the greatest possible level of efficiency (for electrical and natural gas fuel consumption) is attained. Treated air is directed up the vertical exhaust stack. A steel ladder and catwalk mounted on the stack allow access for obtaining exhaust air samples to monitor the system's volatile contaminant destruction efficiency.

1.2.2.2 Inlet Demister

The inlet demister, located in the duct between the DAS basins and the TOU, is a Chevron-type screen constructed of type 314L stainless steel engineered to remove 99% of particles greater than 20 um diameter from the air stream, while allowing a maximum pressure drop across the device of 1 inch water column (W.C.). The demister removes particles and water droplets from the air stream prior to its entering the regenerative thermal oxidizer (RTO). This particulate matter could collect on the RTO media surface, reducing system efficiency.

1.2.2.3 Regenerative Thermal Oxidizer (RTO)

The regenerative thermal oxidizer (RTO) consists of three vertical heat recovery chambers containing ceramic media and a single combustion chamber aligned horizontally across the tops of the recovery chambers. Flow of contaminated air through

the recovery chambers is regulated by a series of flow control valves, driven by a single drive shaft. An adjustable speed direct current (DC) motor rotates the drive shaft, opening and closing the valves in a sequence designed to alternate both inlet and exhaust air flow through the three recovery chambers. Contaminated process air drawn from the tops of the DAS basins enters the bottom of the RTO through a main inlet manifold and is directed up through whichever recovery chamber is currently in the "inlet" mode as determined by valve positions. The air passes through heat-retaining ceramic media in the recovery chamber, absorbs thermal energy from a previous exhaust mode, and increases in temperature to nearly 95% of the main combustion chamber temperature. Two burners, fueled by natural gas, provide the additional thermal energy necessary to maintain the desired combustion chamber temperature. Organic contaminants are oxidized in this process, and the air now exits the combustion chamber through whichever recovery chamber is in the "outlet" mode as determined by valve positions. As the hot air passes downward through the recovery chamber, it reheats the ceramic media and the chamber is said to be "thermally regenerated."

1.2.2.4 Caustic Scrubber

Hydrochloric acid (HCl) is a combustion byproduct resulting from the destruction of chlorinated hydrocarbons in the RTO and is an environmental and health hazard if released to the atmosphere. The caustic scrubber uses a dilute solution of sodium hydroxide to react with the HCl in the exhaust gas to form harmless salts. The scrubber consists of a fiberglass cylindrical tower with a liquid holding tank, or sump, at the

bottom, an intermediate section containing plastic media, and an air outlet duct at the top that connects to the main exhaust fan intake pipe.

Two caustic solution recirculation pumps are mounted next to the scrubber tower. These pump water from the tower sump to spray nozzles located above the plastic media surface and to a venturi-type pre-quencher where RTO exhaust gas is cooled by the liquid prior to entering the scrubber. RTO exhaust is drawn up through the tower, counter-current to the flow of caustic solution, which trickles down through the media. The purpose of the tower media is to provide a large wetted surface area, maximizing contact between HCl in the gas and the neutralizing sodium hydroxide solution. A sodium hydroxide bulk storage tank is located in the TOU Building adjacent to the scrubber tower. A chemical metering pump is used to deliver this caustic into the scrubber water to maintain a pH of 7.0 or greater so HCl removal will occur.

A portion of the scrubber water is continuously removed from the process (referred to as "blowdown") to prevent excessive accumulation of salts in the scrubber solution. Additional scrubber water is lost from the process through evaporation, so fresh make-up water is added as necessary. Float switches located in the tower sump signal a solenoid valve installed on the plant effluent pressure line to open when make-up water needs to be added to the system, and close the valve when the tank level reaches the designated full level. Both the blowdown and make-up water flow rates are manually regulated by adjusting ball valves located in the appropriate pipe sections. Blowdown water and water collected in the inlet duct demister drain to a 200 gallon storage tank located in the TOU

Building. Wastewater that accumulates in this storage tank is pumped to the DAS system splitter box.

1.2.2.5 TOU Building

As well as housing the sodium hydroxide storage tank, chemical metering pump, and wastewater storage tank, the TOU Building also contains the exhaust fan VFD, the RTO control panel, and electrical breakers for the various powered equipment associated with the system. Temperature sensors, flow meters and other monitoring devices located throughout the TOU system all feed signals back to the RTO control panel where operating parameters can be viewed by operators. Some parameters are permanently recorded on a strip chart to allow review of historical conditions of the system and others generate alarms when conditions deviate from normal operating ranges.

1.2.3 Powdered Activated Carbon Treatment (PACT) System (PCT 201,202)

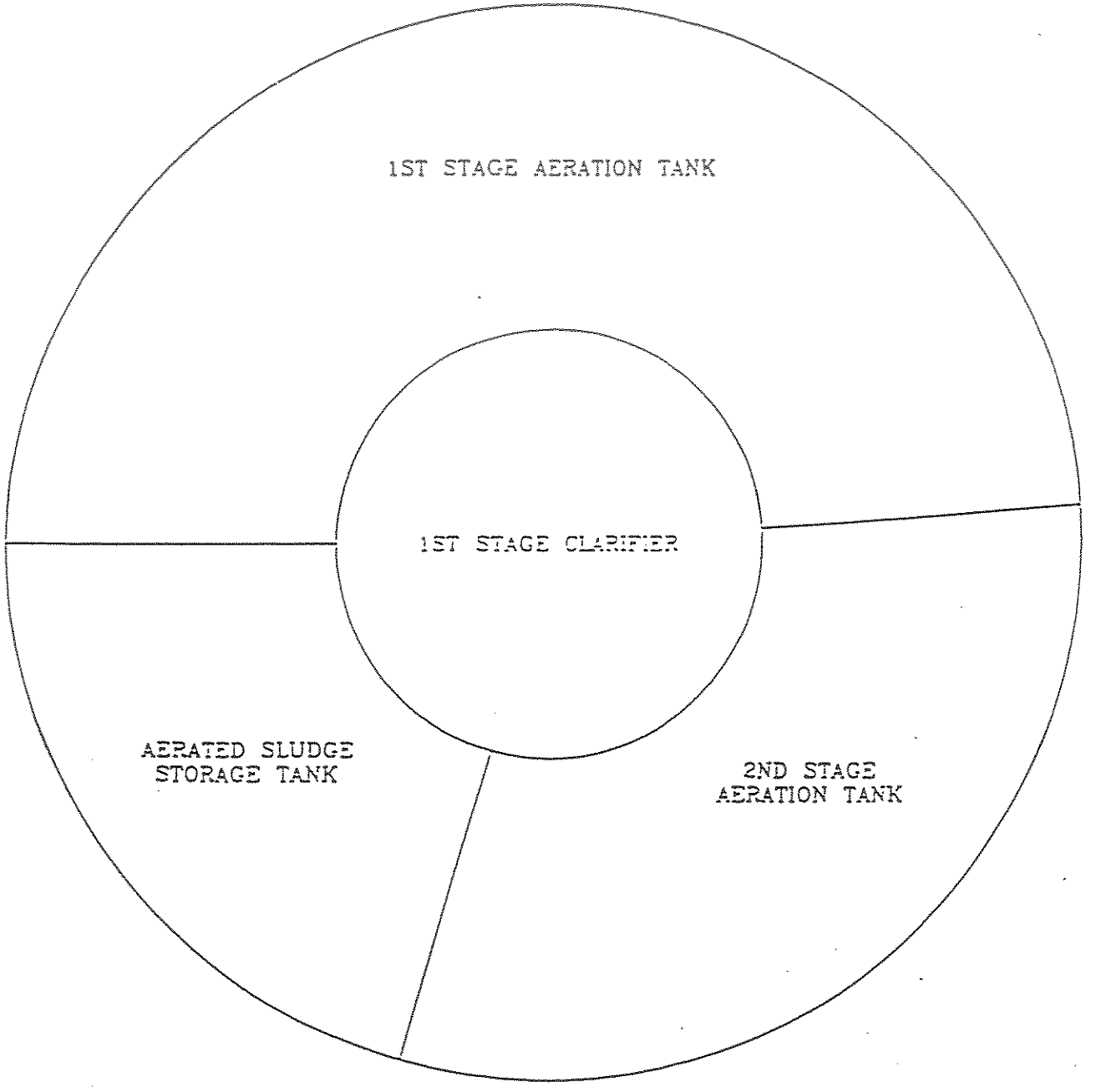
The powdered activated carbon treatment (PACT) system used at the OTT/Story/Cordova GWTF is a combination biological/chemical treatment developed by Zimpro Environmental, Inc. Like the conventional activated sludge process, microorganisms are used to remove contaminants from the wastewater by consuming them as food. The addition of powdered activated carbon (PAC) buffers the effects of toxic and shock loads on the biomass, and also improves oxygen transfer efficiency in aeration tanks so desired dissolved oxygen levels are more easily obtained. Two PACT systems are provided

(PCT-201 and 202), designed to be operated in parallel, and are identical in construction. Typically, wastewater effluent from DAS 101 flows to PCT-201 and flow from DAS 102 goes to PCT-202. Several subsystems of the PACT process are housed within a single structure referred to as a multi-purpose tank and illustrated in Figure 1.11. Each multi-purpose tank is a domed circular structure 115 feet in diameter with an outside sidewall height of 16 feet, nine inches. The first stage clarifier is located in the center of the multipurpose tank. The peripheral area around the clarifier is divided into three sections by steel walls and form the first stage aeration tank, second stage aeration tank, and aerated sludge digester. Other components of the PACT system are located elsewhere in the facility. Description summaries of the PCT components are provided in the following subsections.

1.2.3.1 First Stage Aeration Tank

The first stage aeration tank occupies a 176° segment of the peripheral area of the multi-purpose tank and has a capacity of 476,000 gallons. Wastewater flow from the DAS basins first enters the PACT system here. Organic compounds and nitrogen present in the wastewater serve as food for the aerobic bacteria population maintained in this tank. Fine bubble diffusers mounted on polyvinyl chloride (PVC) air supply piping are situated along the floor of the aeration tank. Activated sludge blowers (ASB-120, 121, 122) provide the air for these diffusers that both oxygenates the water as well as mixes the contents of the tank, putting the organisms and their food in contact with each other. The first stage aeration tank is kept full, so as additional wastewater from the DAS enters the

Figure 1.11
Multi-Purpose Tank



system, there is a continuous flow out, into the first stage clarifier in the center of the multi-purpose tank.

1.2.3.2 First Stage Clarifier

The first stage clarifier is a circular tank located in the center of the multi-purpose tank and is 46 feet in diameter with a capacity of about 200,000 gallons. Flow from first stage aeration enters the center of the tank and calm conditions maintained in the clarifier allow solids in the wastewater to settle to the bottom by gravity. Clarified water leaves the tank over weirs near the outside wall of the tank and flows into the second stage aeration basin.

The clarifier floor slopes towards the center of the tank where a small sump is located. Piping from this sump extends to the return sludge pumps (RSP-220, 221, 222) that return the settled solids, which contain primarily microorganisms, to first stage aeration. A collector mechanism is used to move the settled solids to the center of the clarifier. The collector mechanism consists of a bridge that spans the clarifier. A drive motor and gear reducer are mounted on the center of the bridge and a drive shaft extends from the bottom of the gear reducer to a lower bearing and support near the bottom of the clarifier. Two collector arms spaced 180° apart are mounted to the drive shaft and extend to the outer wall of the tank. Scraper blades are attached to the collector arms in such a way that, as the drive shaft slowly turns, the blades direct settled solids toward the center sump. An additional arm is attached to the drive shaft and extends to the tank's perimeter

at the water surface. This skimmer collects floating material from the clarifier surface and deposits it in a small sump. A scum pump in the sump periodically pumps this material to the aerated digester.

1.2.3.3 Second Stage Aeration Tank

The second stage aeration tank occupies a 110° segment of the peripheral area in the multi-purpose tank and has a capacity of 269,000 gallons. Like first stage aeration, fine bubble diffusers are located along the bottom of the tank and the ASBs provide the air that oxygenates and mixes the wastewater. In addition, powdered activated carbon (PAC) is added to this aeration basin to adsorb toxins and contaminants not readily consumed by the bacteria population. First stage clarifier effluent enters the second stage aeration tank, and the tank overflow goes to the second stage clarifier.

1.2.3.4 Second Stage Clarifier (C-301, 302)

The second stage clarifiers are not part of the multi-purpose tank, but are stand alone structures located just south of the PACT tanks. The second stage clarifier is 45 feet in diameter and nearly 15 feet tall, with a capacity of about 175,000 gallons. Like the first stage clarifiers, the tank is equipped with a settled solids collection system directing sludge to a sump in the center of the tank. Piping from the sump allows the secondary clarifier solids to be returned to the second stage aeration tank using recirculating sludge pumps RSP-320, 321, 322. Facility design also allows addition of a polymer solution

into the second stage aeration effluent as it enters the second stage clarifier to improve the settling characteristics of the solids. Effluent from the second stage clarifiers leaves the tank by overflowing weirs located near the outside wall. This water flows by gravity to the tertiary filter tank located inside the Groundwater Treatment Building (GTB).

1.2.3.5 Aerated Sludge Tank

The remaining 74° segment of the multipurpose tank is the aerated sludge tank with a capacity of 200,000 gallons. Although most of the settled solids in the first stage clarifier are returned to first stage aeration, providing the microorganisms needed to consume contaminants in the wastewater, it is necessary to periodically remove some of the microorganisms from the system to prevent over-population. This waste activated sludge is pumped to the aerobic digester using the return activated sludge pumps RSP-220, 221, 222. The aerobic digester acts as a storage tank for the wasted carbon/biomass solids until they are dewatered in the filter presses and disposed of. Diffusers located along the digester bottom allow the stored solids in the tank to be aerated, so they remain under aerobic conditions during the storage period. Addition of air to the aerobic digester keeps the tank contents well mixed, and also facilitates the oxidation of volatile solids, reducing the volume of waste sludge that must be disposed of. As the aerobic digester becomes full, it may be necessary to remove some of the tank's contents. If the air flow to the digester is shut off, the solids will settle to the tank bottom, leaving a clear water layer on top. A 6-inch diameter decant line has been provided, attached to an electric winch that normally suspends the decant pipe well above the surface of the digester. The winch is

used to lower the decant pipe below the surface of the clear liquid, which then flows by gravity to a wastewater sump located in the Sludge Treatment Building (STB). After the desired amount of supernatant has been decanted from the digester, the decant pipe is again raised and air flow restored to the tank.

1.2.3.6 Activated Sludge Blowers (ASB-220, 221, 222)

Three activated sludge blowers, located in the Blower Building along with the DAS blowers, provide the compressed air needed for the PACT system. The blowers, manufactured by Ingersoll-Rand, are driven by 400 hp electric motors. Each blower has an air pumping capacity of 5556 cfm at 8 psi discharge pressure. Supply air for the blowers is from the atmosphere, drawn through filters mounted on the top of the Blower Building. Air discharged to the PACT aeration tanks oxygenates the wastewater to suitable dissolved oxygen levels and provides mixing of the tanks' contents as well.

1.2.3.7 Return Sludge Pumps (RSP-220, 221, 222 and RSP-320, 321, 322)

All six return sludge pumps, located in the Sludge Pumping Building between the PACT multipurpose tanks, are identical 10 hp ITT Pump Company centrifugal pumps with a rated capacity of 500 gpm. The pump motors are driven by individual variable frequency drive (VFD) units operated by programmable logic controllers (PLCs). The PLCs allow the desired pumping rate in gpm to be input, and the VFDs regulate the pump motor speed to maintain that pumping rate. The 200 series RSPs normally pump settled solids

from the first stage clarifier back to first stage aeration, but a pair of motor operated valves (MOVs) located on the pump discharge piping are used to temporarily divert the pump discharge to the aerobic digester during wasting. The 300 series RSPs normally pump settled solids from the second stage clarifier back to second stage aeration, but a pair of MOVs located on the pump discharge piping are used to temporarily divert the pump discharge to first stage aeration during wasting.

1.2.3.8 Sludge Transfer Pumps (STP-211, 212)

Two sludge transfer pumps are also located in the Sludge Pump Building that draw sludge from the bottom of the aerobic digester. This waste sludge is pumped to the sludge holding tank (ST-701) using the ITT Pump Company 3 hp centrifugal pumps with a rated capacity of 100 gpm so it can subsequently be dewatered and disposed of.

1.2.3.9 Phosphoric Acid Feed Pumps (PAP-630, 631, 632)

The microorganism population maintained in first stage aeration requires the organic contaminants present in the wastewater, an adequate supply of oxygen and essential elements including nitrogen and phosphorus to survive. Ammonia in the waste stream satisfies the nitrogen requirement, but often the phosphorus levels are too low to encourage good bacteria growth. A phosphorus feed system is in place to supplement the biomass' requirements in the form of phosphoric acid. The 4000 gallon fiberglass phosphoric acid storage tank and three chemical metering pumps are located in the Groundwater Treatment Building (GTB) inside a concrete retaining wall that will contain

any leaks from the tank or piping. Three Wallace and Tiernan Series 44 Tandem diaphragm metering pumps with manual stroke control, driven by ¼ hp motors with a maximum pumping capacity of 12 gph, deliver phosphoric acid to the ten-inch diameter wastewater line between the DAS basin and PACT tank just prior to first stage aeration. A stroke volume controller regulates the chemical feed rate and the pumps may also be operated by a timer so the proper daily nutrient requirement is supplied.

1.2.3.10 Polymer Feed System

The polymer feed system is located in the Sludge Treatment Building (STB) and consists of three Model PB 1000 Polyblend units manufactured by Stranco, Inc. Polymer is a long-chained molecule with numerous reactive sites located along its length. Small particles present in the wastewater attach to these reactive sites producing a larger particle that settles more quickly in a clarifier. PAC particles present in the second stage aeration tank effluent settle very slowly in the second stage clarifier, and even flow right through the tank without being removed, unless a polymer solution is added to coagulate these tiny particles. The Polyblend system consists of chemical metering pumps (PMP-620, 621, 622) that pump a concentrated polymer emulsion from a 55 gallon drum into a flow-through, multizone mixing chamber where the polymer is diluted with water and carried to its feed point at the second stage clarifier influent line.

1.2.3.11 Powdered Activated Carbon (PAC) Feed System

The powdered activated carbon (PAC) feed system is comprised of a 3000 cubic feet capacity bulk storage silo, a volumetric rotary-type dry chemical feeder, a wetting chamber, a slurry holding tank and two Wilden air-operated diaphragm pumps that deliver the carbon slurry to the second stage aeration tanks in the PACT multi-purpose tank. The storage silo is located just outside the south side of the Groundwater Treatment Building (GTB) and also houses the dry chemical feeder. The slurry holding tank and feed pumps are located inside the GTB along the south wall.

The dry chemical feeder consists of a rotating paddle that delivers PAC from the storage silo above into a venturi-type mixing chamber. Spray nozzles in the venturi funnel wet the carbon and water pumped through an induction line beneath the funnel draws the wetted carbon into the slurry holding tank. Two mechanical mixers inside the slurry holding tank keep the slurry agitated so powdered carbon does not settle out in the holding tank. PAC slurry is pumped to the second stage aeration tanks by the diaphragm pumps.

A control panel inside the GTB next to the delivery pumps houses the controls, switches, relays and timers necessary for system operation. The paddle speed for the dry chemical feeder is adjustable and make-up water flow rates are manually controlled using valves on the inductor supply lines.

1.2.4 Tertiary Filter System

Second stage clarifier effluent from the PACT system enters the Groundwater Treatment Building (GTB) and flows into the tertiary filter storage tank (NFT-401) located in the southwest corner of the GTB. Two tertiary filter pumps (TP-510, 511) are provided to pump water from the storage tank through the tertiary sand filters. The purpose of the tertiary sand filters is to remove remaining suspended solids and phosphorus-containing compounds from the treatment stream. Most of the phosphorus in the water at this point is soluble and cannot be removed by filtering. However, ferric chloride may be fed into the tertiary filter supply line ahead of the filters to react with dissolved phosphates to form insoluble iron phosphates that can be filtered out.

1.2.4.1 Tertiary Filter Pumps (TP-510, 511)

Both of the tertiary filter pumps deliver water from the storage tank to a single 8-inch discharge line that transports the water to a header leading to the three tertiary filters. Though the motor driving the pump is single-speed, pumping output is regulated using a motor operated valve (MOV) on the discharge side of each pump. MOV operation is regulated by a controller that opens or closes the valve based on water level in the storage tank.

1.2.4.2 Ferric Chloride Feed System

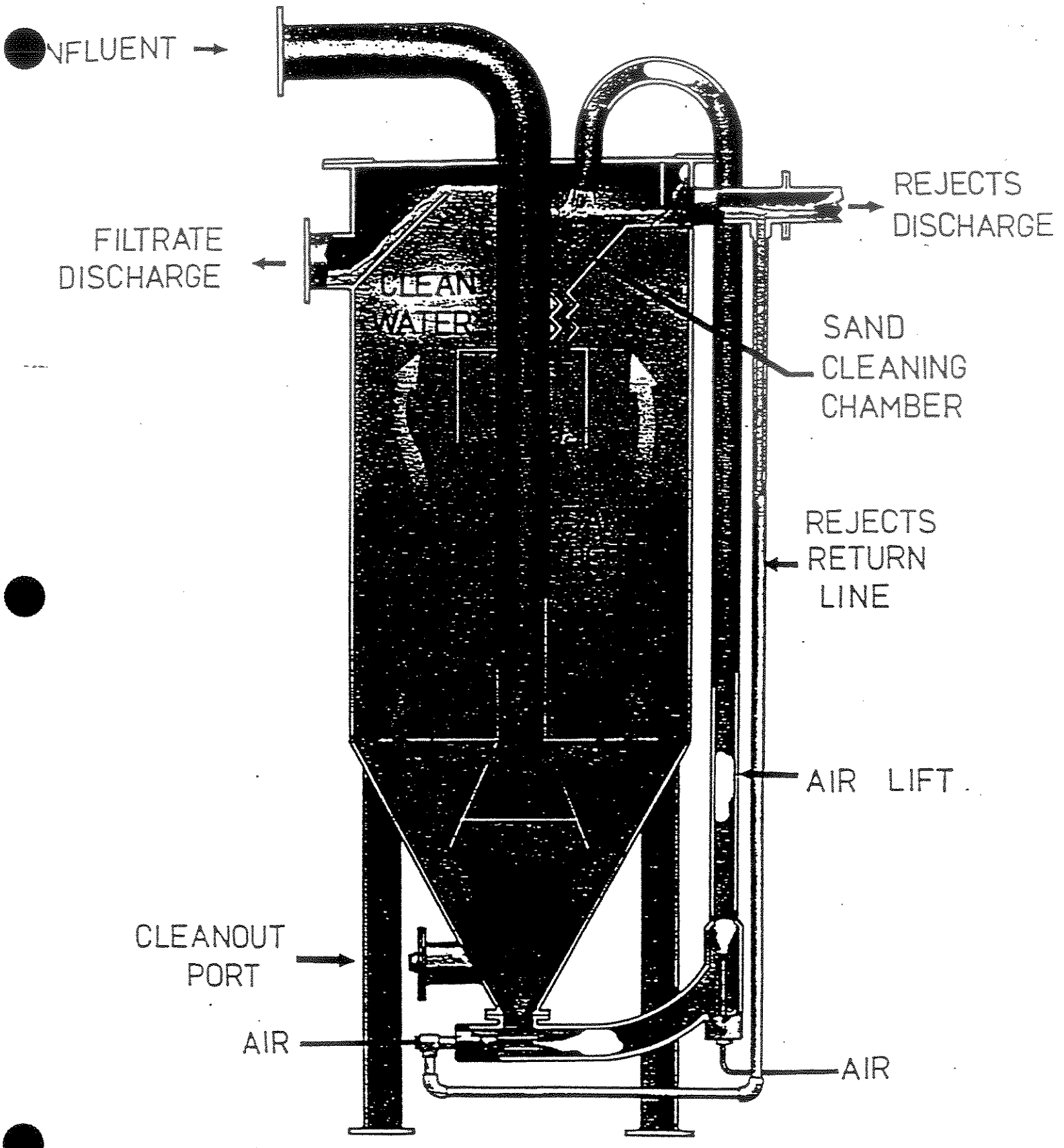
Ferric chloride is injected into the tertiary filter pump effluent pipe immediately in front of an in-line static mixer to assist in phosphorus removal. The static mixer is a section of pipe containing internal fins that agitate the water flowing through it, thoroughly mixing the chemical added. The feed system consists of a 4000 gallon fiberglass storage tank and two Wallace and Tiernan Series 44 tandem diaphragm metering pumps (FCP-600, 601) with electric stroke control driven by a ¼ hp motor. All are enclosed within a concrete retaining wall that contains any leaks from the tank or plumbing.

1.2.4.3 Tertiary Sand Filters (TF-521, 522, 523)

The tertiary sand filter system consists of three Model H64-5B 1.5 Hydrasand Filters manufactured by Andritz Sprout-Bauer, Inc. Each unit is comprised of a 9 foot diameter top feed carbon steel filter vessel, an inlet assembly, external sand lift with dual air transport injection, a sand cleaning chamber and sand distribution chamber and has a rated flow capacity of 384 gpm. The filter media inside the vessel is 1.2 mm silica sand and the bed depth is 80 inches. A manual shut-off valve is located on the inlet of each filter, so an individual filter may be taken off-line for maintenance while the others remain in service. A cut-away diagram of a Hydrasand filter is shown in Figure 1.12.

The discharge line from the tertiary filter pumps enters the Hydrasand filter through its open top and extends to near the bottom of the vessel where wastewater flows out

Figure 1.12



HYDRASAND FILTER

through a radial hub into the filter bed. Inverted U-shaped troughs attached to the hub uniformly distribute water into the filter vessel to prevent fouling and short-circuiting through the sand media. From the vessel bottom, water flows vertically upward and suspended particles (primarily residual powdered carbon and the iron phosphate floc) are trapped and held in the media.

After passing through the media, filtered water enters the filtrate zone above the sand and flows over the effluent weir into piping that directs it to the effluent storage tank. The sand at the bottom of the filter, along with solids it has trapped, is continuously transported to the top of the Hydrasand filter by an air lift system. Two polyethylene pipes connected to the bottom of the vessel fill with the sand/solids mixture. Air supplied by four high pressure air compressors located along the west wall of the Groundwater Treatment Building (GTB) is injected into these pipes. As the air rises, it carries the dirty sand to the top of the filter and deposits it in the sand wash chamber. A portion of the filtrate water (normally 2-10% of the total flow through the filter) flows upward through the media distribution chamber and the sand wash chamber, washing contaminant solids particles from the sand that has been deposited in the chamber by the air-lift lines.

The wash water flows over an adjustable reject weir and eventually to the GTB sump from where it is pumped to the DAS splitter box for treatment through GWTS processes. The cleaned sand falls downward through the media distribution chamber and again becomes part of the filter bed. Under normal operating conditions, the entire sand filter bed is turned over, and thus cleaned, approximately once every twenty-four hours.

1.2.5 Granular Activated Carbon (GAC) Treatment

Trace concentrations of soluble organic contaminants may still remain in the treated groundwater at this point, so two Calgon Carbon Company Model 10 GAC Adsorber Systems have been installed in the GTB as a final treatment process. Each Model 10 consists of two adsorber vessels 10 feet in diameter with a straight side height of 10 feet. Each vessel holds 20,000 pounds of granular activated carbon (GAC) and each Model 10 System has a flow capacity of 700 gallons per minute (gpm) when operated in series and 1400 gpm when operated in parallel. Wastewater flow through each vessel is from top to bottom and filter nozzles mounted on the tank bottom allow water to flow through the vessel while the GAC media remains in the tank. Granular activated carbon adsorbs contaminants in the water and effluent from the system is virtually pollutant-free.

A valve arrangement provided between the two vessels that make up each Model 10 adsorber unit allows manual control over the direction of water flow through each tank and permits the media to be backwashed to remove particulates that accumulate and gradually restrict flow through the unit. To prevent damage to the carbon vessels from excessive pressures, pressure relief devices are provided in the adsorber vent lines. These devices are replaceable graphite rupture disks with a rated burst pressure of 75 psi. An additional vessel is provided that normally remains empty, but is used to facilitate carbon transfer whenever the media is replaced, or to store backwash water when the rate of

washwater discharge to the GTB sump and then through treatment plant processes needs to be controlled.

1.2.6 Solids Handling System

The only waste material generated by the GWTS is the excess sludge removed from the PACT system that accumulates in the aerobic digesters. All other waste streams are recycled through treatment processes by pumping them back to the DAS splitter box. Components of the waste solids handling system include a sludge holding tank, a lime conditioning system, filter press feed pumps, plate and frame filter presses, a high pressure filter wash system and a filter acid wash system.

1.2.6.1 Sludge Holding Tank (ST-701)

Waste sludge that accumulates in the PACT system aerobic digesters is pumped to the sludge holding tank located outdoors on the north side of the Sludge Treatment Building (STB). Two sludge transfer pumps (STP-211 and 212) manufactured by ITT Pump Company and driven by a 3 hp electric motor with a pumping capacity of 100 gpm are located in the Sludge Pump Building. Piping from the aerobic digesters to the pumps and from the pumps to the sludge holding tank are 4 inches in diameter. The carbon steel sludge holding tank, manufactured by Smith and Loveless, Inc., is 16 feet tall and 15 feet in diameter. A platform mounted on the tank top holds a 5 hp mixer unit that keeps the

tank contents mixed and the solids in suspension. Filter press feed pumps draw sludge from the holding tank and deliver it to the filter presses.

1.2.6.2 Lime Conditioning System

Waste Sludge in the sludge holding tank can be conditioned with a lime slurry to improve its dewatering characteristics. A lime silo, 12 feet in diameter and 42 feet high, is located outdoors east of the STB. Pebble lime may be received in a bulk shipment and stored in the silo. Below the lime storage tank and within the silo structure is a system that generates a lime slurry by mixing the dry pebble lime with water. Lime is transferred into the slurry tank (LST-642) using a volumetric feeder (LVF-646J). The slurry stored in the slurry tank is continuously mixed since the lime settles out very rapidly. Lime from the slurry tank is delivered to the sludge holding tank through a 3-inch feed line using lime slurry pumps LSP-640 and 641.

1.2.6.3 Filter Press Feed Pumps (FFP-710, 711, 712, 713)

Four filter press feed pumps are located inside the STB that transfer waste sludge from the sludge holding tank to the filter presses. The filter pumps, manufactured by JWI, Inc., are hydraulically-assisted, electric motor driven, positive displacement diaphragm pumps. A clutch mechanism automatically adjusts pump stroke length in response to the discharge pressure from the pump into the filter press. Inlet valves from the sludge holding tank are manually configured to provide flow to the desired pump while

discharge valves driven by air actuators are electronically selected from a control panel to direct flow to the operating pressure filter. Pulse dampeners are supplied to maintain a steady flow of liquid from the pumps and are equipped with manual bleed off valves to allow the release of excess pressure from the pump discharge. These sludge pumps deliver liquid sludge to the filter presses at pressures up to 200 psi.

1.2.6.4 Filter Presses (FP-721, 722, 723)

Dewatering waste sludge into a solid sludge cake makes its disposal easier and more cost efficient. Three plate and frame filter presses, manufactured by JWI, Inc. and located in the STB, are provided. The filter presses are mounted overhead to allow containers that collect the dewatered sludge to be placed beneath them. Each filter press is 297 inches long and 95 inches wide and contains fifty 1200 mm square polyethylene plates suspended on a steel frame. Both sides of each plate are covered with a polyester filter cloth which traps solids but allows water to pass through. Grooves on the plate face surface allow this water to drain from the press.

A two-stage hydraulic package is part of the system. A high volume, low pressure hydraulic pump is used to open and close the filter press. A second high pressure hydraulic pump is used to clamp the press closed during operation to prevent sludge from leaking between the plates. After an empty press is clamped closed, liquid sludge is pumped through the filter using the filter feed pumps. A drain line directs the filtrate

water that passes through the cloths to a sump in the STB. Submersible pumps in the sump pump this wastewater to the DAS flow splitter. As solids collect on the surface of the filter cloths, the pressure required to continue the dewatering process increases and the filtration rate decreases as indicated by a reduction in the filtrate flow rate. When a filtration cycle is complete, the filter feed pump is shut off. Electric actuator valves positioned on air lines temporarily open to blow the liquid sludge remaining in the supply line back into the sludge holding tank (core-blow) and to blow out remaining filtrate water in the drain lines (air-blow). Two high pressure air compressors mounted on the floor of the STB provide the compressed air required for core-blow and air-blow.

During a filtration cycle, and during filter cloth pressure wash and acid wash procedures, drip trays underneath the filter press plates remain closed to capture water and direct it to the STB sump. When a filtration cycle is complete, the drip trays are opened, the press is depressurized and opened, and the plates are individually shifted to allow the dewatered cake to fall into 20 yard capacity roll-off containers located below the presses.

1.2.6.5 Pressure Wash System

After a number of filtration cycles, the polyester filter cloths may become plugged resulting in a substantial drop in filtration rate. A high pressure wash system is provided to clean the cloths and consists of a 1000 gallon wash water storage tank, a water pump generating pressures up to 1500 psi, and spray nozzles that distribute the pressurized washwater stream across the cloth surfaces. Float switches located inside the washwater

storage tank signal a solenoid valve located on the facility pressurized non-potable water line to open and close in order to keep the tank full. Washwater sprayed on the filter cloth is contained by the closed drip trays below the filter press and drains to the STB sump.

1.2.6.6 Acid Wash System

If pressure washing does not adequately clean the filter cloths, the supplied acid wash system may be used. An acidic solution is used to dissolve tiny particles that have plugged pores in the cloths. The acid wash system is comprised of a 1000 gallon acid solution storage tank with a mechanical mixer where concentrated acid is diluted in water, a chemical transfer pump that pumps the concentrated acid from 55 gallon drums to the acid solution storage tank, and a high capacity water pump that recirculates the acid solution through the filter press.

To operate the acid wash system, the acid solution storage tank is partially filled with water, then the required volume of concentrated hydrochloric acid is pumped into the tank and the mixer activated to produce the diluted acid solution. With the filter press hydraulically clamped closed and the valves arranged to direct flow to the desired filter press, the acid washwater pump is started. The acid solution enters the filter and drains back to the acid washwater storage tank. In this manner, the acid solution can be recirculated through the filter press until the acid wash cycle is complete and the pump shut off. Used acid wash water in the storage tank is then drained to the STB sump.

1.2.6.7 Filter Press Control Panel

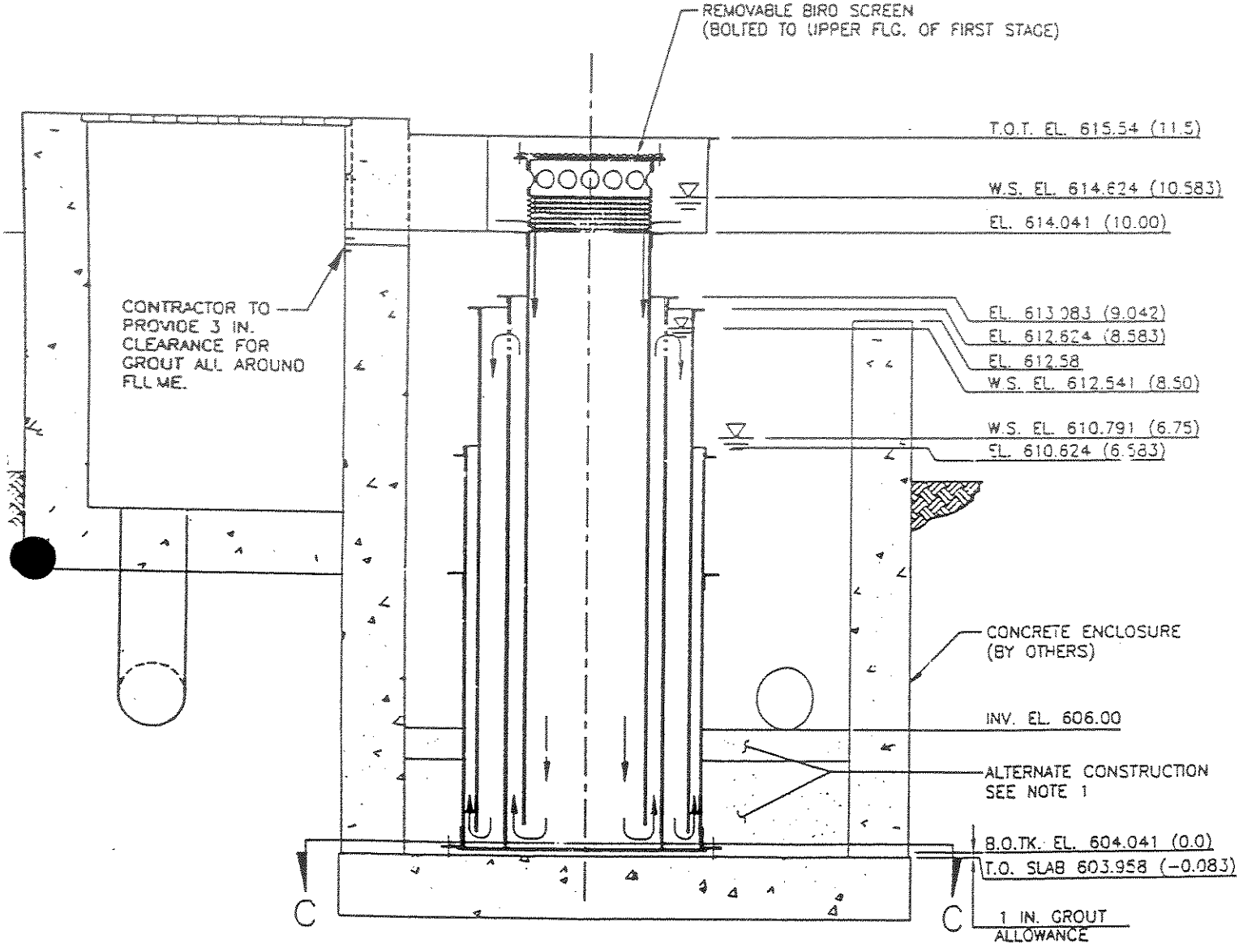
The filter press control panel is located on the elevated platform next to the filter presses. This panel contains switches for all the filter press functions including filter sludge pump selection and operation, filter press selection and operations, plate shifting, core-blow, air-blow, pressure washing and acid washing, the panel indicator lamps that show filtration cycle status, and any alarm conditions caused by process malfunctions.

1.2.7 Static Aerator

To ensure appropriate dissolved oxygen (D.O.) concentrations are present in treated groundwater discharged to the receiving stream, a static aerator is installed in the effluent line several hundred yards before the outfall. The OxyCharger Model OC-184, manufactured by Parkson Corporation and illustrated in Figure 1.13, is a system of stainless steel baffles, screens and troughs that stands about eleven feet tall and is contained within a concrete vault. Flow through the device is by gravity and results in considerable agitation that increases D.O. to a minimum of 6.0 mg/L at the design flow rate of 860 gpm. The vault and aerator are covered by grating to prevent debris from entering the system and obstructing flow.

FIGURE 1.13

OxyCharger Model OC-184 Static Aerator



2.0 THEORY OF OPERATION

Various scientific principles are involved in the design and operation of the GWES and GWTS. Subsurface investigations first determined existing conditions at the site including aquifer elevations and flow rates, soil and water contaminant concentrations, and physical characteristics of local geological formations. Computer models were used to predict the fate of contaminant migration, and design a system to both effectively remediate conditions at the Site and prevent the spread of contaminated groundwater beyond the boundaries of the containment area. The groundwater extraction system network installed at the Ott/Story/Cordova Superfund Site will be operated for a number of years until restoration of the affected aquifer is complete.

Analytical testing of the extracted groundwater identified the pollutants requiring treatment and their concentrations. This information, along with the pumping requirements of the GWES, was used to select the types and sizes of the treatment processes comprising the GWTS. More specifically, the extraction system pumping flow capacity is currently 880 gpm from the eleven extraction wells and the treatment plant was designed for a flow rate of 900 gpm.

Each individual GWTS process was included in the facility design to perform specific functions that together achieve contaminant removal goals. The theory of operation of these processes is presented in the following subsections.

2.1 DIFFUSED AIR STRIPPING

Roughly half of the contaminants present in the extracted groundwater at this site are volatile organic compounds (VOCs) such as benzene, toluene, 1,2-dichloroethane, 1,1-dichloroethane, 1,1,1-trichloroethane and vinyl chloride. VOCs have a high vapor pressure and, therefore, a greater affinity for air than water. Volatile compounds in water readily vaporize when they come in contact with air, making diffused air stripping a suitable treatment process when these contaminants are present.

The diffused air stripping process included in the GWTS is designed to provide high airflow through the contaminated wastewater in an enclosed vessel. At a design air flow capacity of 4500 cfm and maximum water flow rate of 120 cfm, the air to water ratio is nearly forty to one in the DAS process. In addition, supplying the air as tiny bubbles by using diffusers maximizes the air/water interface surface area. High VOC removal rates are achievable using diffused air stripping.

2.2 THERMAL OXIDATION

Although air stripping removes VOCs from groundwater, these compounds remain a pollutant in the gaseous state. The contaminant-carrying air stream from the DAS vessels is contained in ductwork and directed to the TOU. Though the volatile compounds are stable at ambient temperatures, high temperatures and aerobic conditions in the TOU combustion chamber destroy the chemical bonds holding the volatile compounds'

molecules together, oxidizing them to primarily carbon dioxide, water and inorganic salts. The resulting combustion products are far less hazardous than the VOCs destroyed. Nearly all the VOCs entering the TOU are oxidized when a temperature of 1800° F is maintained.

2.3 POWDERED ACTIVATED CARBON TREATMENT (PACT)

Other contaminants present in the extracted groundwater include semivolatile organic compounds (including camphor, and several different benzeneamines) and other substances like ammonia, metals, cyanide and oxygen-depleting chemicals as measured by biochemical (BOD) and chemical oxygen demand (COD) tests. These pollutants are not removed in the air strippers so subsequent treatment processes are provided.

Zimpro Environmental, Inc., developed the PACT system installed at the Ott/Story/Cordova groundwater treatment facility. Zimpro's PACT Operations Manual located in the operator office provides an excellent discussion concerning the theory of operation of this system. Basically, the PACT system utilizes bacteria maintained in an oxygen-rich environment that consume contaminants present in the wastewater as food. In addition, powdered activated carbon is added to adsorb certain pollutants that may be toxic to the microorganisms or not a suitable food source.

The system includes blowers and diffusers to elevate the dissolved oxygen (DO) level in the mixed liquor, the term used for the contaminated wastewater/microorganism mixture

maintained in the system's aeration tanks. Bacteria use up DO by respiration and during digestion of food. In addition, the bacteria population in the aeration tanks must be maintained at a level to adequately consume the contaminants that continuously enter the tank. Since this is a flow-through system, the microorganisms are carried out of the aeration tank along with the treated wastewater. Clarifiers are provided in series with the aeration tanks to allow the biomass to settle out so they can be pumped back to the aeration tank. The pumping rates used are based on maintaining the desired food to microorganism (F/M) ratio in the aeration tank. F/M ratios of about 0.1 to 0.2 pounds of food (contaminants) per day per pound of biomass in the aeration tank are generally maintained.

Design of the low pressure air blowers and diffusers was based on the expected oxygen requirements of the system. Aeration tanks and clarifier volumes were based on design contaminant concentrations and hydraulic flow rates. Combined into a single packaged system, the PACT process provides significant contaminant removal.

2.4 TERTIARY SAND FILTRATION

Even with the use of polymer coagulants in the influent to the second stage clarifiers of the PACT system, that tank's effluent still contains a substantial amount of suspended solids. The tertiary sand filters house a sand media that physically retains these solids while water passes through. Though the sand filters installed at the OTT/Story/Cordova GWTS are somewhat unique in that they are continuously backwashed and so never have

to be removed from service for a cleaning cycle, the principle of operation is the same as any physical filter. The sand media is packed together closely enough so particulate matter in the treated water cannot pass through. Typical suspended solids loading on the tertiary sand filters is 20-50 mg/L, and is reduced to <10 mg/L in the filter effluent.

2.5 GRANULAR ACTIVATED CARBON TREATMENT

Calgon Carbon Corporation's Operating Manual for the Model 10 unit is located in the operators office at the Ott/Story/Cordova treatment facility and provides a good discussion on how activated carbon removes contaminants from wastewater. Basically, the activated carbon used has an incredibly large internal pore volume and a network of submicroscopic pores where adsorption takes place. Gaseous or liquid contaminants in the wastewater become attracted (adsorbed) to the solid carbon particle surface by attractive forces known as London Dispersion Forces. These attractive forces eventually adsorb the contaminant molecules deep into the micropore GAC structure where they become trapped. Complete contaminant removal is typically achieved through the GAC vessels.

2.6 SYSTEM CONTROL INTERLOCKS

Although the described systems can and do function independently, there are control interlocks that affect systems operations under certain conditions.

- Due to the presence of VOCs in the extracted groundwater, the TOU, which destroys these compounds, must be in operation for the GWES and GWTS to run at all. If the TOU is out of service for any reason, the extraction well pumps do not run and the PACT and DAS blowers do not operate. These features prevent the release of VOCs to the atmosphere.

- When the TOU is in operation, the activated sludge blowers (ASBs) providing compressed air to the PACT multi-purpose tank cannot run unless the DAS fans are on first. The DAS fans draw potentially contaminated air from inside the domed PACT structures. Operation of the ASB blowers with the DAS fans off could release VOCs to the atmosphere.

- A high level alarm in the tertiary filter storage tank (NFT-401) will close the inlet valve to the tank and shut down the extraction wells. The purpose of this response is to prevent overflows at the treatment facility. The tertiary filter feed pump will continue to operate and may eventually lower the tank level, clear the alarm, and allow the tank inlet valve to re-open. However, the operator must restart the extraction well pumps.

- If flow from the tertiary filter feed pumps drops below 100 gpm, an alarm is activated and the ferric chloride chemical metering pumps are shut off to prevent a slug of ferric chloride from accumulating in the tertiary filter supply line. When water level in the tertiary filter storage tank (NFT-401) rises and flow to the tertiary filters

increases above 100 gm, the alarm condition will clear; however, the operator must restart the ferric chloride metering pumps.

3.0 EMERGENCY OPERATIONS AND PROCEDURES

Unforeseen events (severe weather, vandalism, fire, flood, equipment failure, loss of utilities, etc.) may require operator response beyond the normal scope of facility operations and maintenance. During an emergency event, consideration should first be given to protecting human health and safety, then to protecting the environment from the release of contaminants and, finally, to safely secure equipment to prevent damage that may result from the event.

A number of safeguards are built into process components that reduce the effects of abnormal conditions. These include the installation of circuit breakers, fuses, and condition responses that automatically disable certain pieces of equipment if potentially dangerous situations arise. Operators responding to an emergency should not put themselves at risk, but should be prepared to take steps to reduce the effects of the event.

3.1 GROUNDWATER EXTRACTION SYSTEM

The extraction well vaults, valve vaults, monitoring wells and control cabinets located throughout the site are secured with padlocks to prevent unauthorized entry or tampering. In addition, an intrusion alarm system is installed in the control cabinets to indicate when unauthorized entry has occurred. Operators must ensure that these security devices are present and operable, not only to protect equipment but for the safety of the public as well.

Two 45 KW propane–fueled generators are provided to operate the seven remote extraction wells if utility power is lost. Loss of electricity at one or all of the extraction wells will not normally cause too many problems in the short run. However, extraction well operations must be restored as quickly as possible to ensure contaminant capture is maintained. If an individual well becomes inoperable, it may be possible to adjust the pumping rates of adjacent wells to maintain the desired capture until repairs can be made or power restored.

The following procedure is followed to operate the standby generators if utility power is lost at the remote extraction wells and the treatment facility is operating normally. Generator sets are located at control cabinets CC-1 (for EWs 1-3) and CC-2 (for EWs 4-7). Extraction well control power wiring runs first through CC-2, then to CC-1, so CC-2 must be started first. This procedure assumes no utility power is available, so all the extraction wells are not running.

Prior to starting a generator, check engine oil, coolant and fuel levels to ensure they are in the normal operating range. Check the condition and tension of the fan and alternator belts and make sure hose connections and battery terminals are tightly fastened. On the generator control panel, the circuit breaker must be open, in the handle down position. Move the three-way switch mounted on the side of the control panel (CC-1 or CC-2) from the "Utility" position to the "Off" position. Start the generator engine by turning the small control switch on the generator control panel to the "Run" position. Allow the engine to run for several minutes and check for abnormal noises, vibration or fluid leaks. When the engine is warmed up, close the generator circuit breaker by moving it into the handle up position. Move the three-way switch to the "Generator" position. The control modules and flow controllers mounted inside the control cabinet will now be powered and the indicating lamps and LED read-outs will be illuminated. The extraction wells are then re-started from the DCS computer located at the treatment facility.

To return to utility power after it is restored, first turn off the extraction wells from the DCS computer. Again, perform the following procedure at CC-2 and repeat at CC-1. Move the three-way switch from "Generator" to "Off", then to the "Utility" position. Re-start the extraction wells from the DCS computer. Move the generator circuit breaker switch to the open position and allow the engine to run an additional ten minutes unloaded to cool down. Then shut off the generator engine by moving the small control switch to the "Off" position. Prior to closing and locking the generator panel doors, check once again for fluid leaks, corrosion or any other abnormal conditions that must be corrected before the generator is operated again.

A more serious problem occurs if operating wells discharge extracted groundwater somewhere besides the double-walled piping system. An alarm system has been installed in each vault to indicate the presence of liquid, and immediate response is required to determine if it is the result of a leak that could flood the vaults and release contaminated groundwater at the surface. A leak-detection system is also installed in the double-walled piping that delivers extracted groundwater to the treatment facility. Operators should not hesitate to shut down an extraction well if release of contaminants to the environment is likely or is occurring. If this cannot be done at the individual well vault, power to the wells can be removed by opening disconnects in the control panels.

In the unlikely event extracted groundwater is released to the surface, operators should isolate the affected area with caution tape to prevent the public from being exposed. If conditions warrant a clean-up, the County Hazardous Materials Response Team may be contacted by dialing '911.'

3.2 GROUNDWATER TREATMENT SYSTEM

The entire GWTS site is surrounded by six feet high chain link fence and entrances are secured to prevent unauthorized entry. An intrusion alarm system has been installed in the front office, operator office and laboratory that notifies a security company when the alarm is activated. Operators must ensure these security devices are present and operable to both protect system equipment and the public.

Interlocks included in the operating system, and discussed in section 2, will help protect equipment and prevent contaminant release. For example, groundwater extraction and blower operations automatically stop when the TOU goes down to prevent contaminant release to the atmosphere. Most pumps will automatically shut off when level monitors indicate water is not available, to prevent damage caused by the pumps running dry. Circuit breakers and fuses on electrical supplies protect both equipment and personnel. The DCS monitoring system provided at this facility provides operator notification of unusual or potentially dangerous conditions by displaying alarms. Appendix B lists

many of the alarm conditions and the required operator responses. In addition, section 5 of this manual describes specific operational adjustments operators may make to keep system processes under control.

3.2.1 Electrical System Back-Up

Electrical service to the GWTS is supplied by Consumers Energy. To report an electrical outage or another electrical emergency, they should be contacted at 1-800-462-5774. Other emergencies requiring police or fire assistance should be reported by dialing '911.'

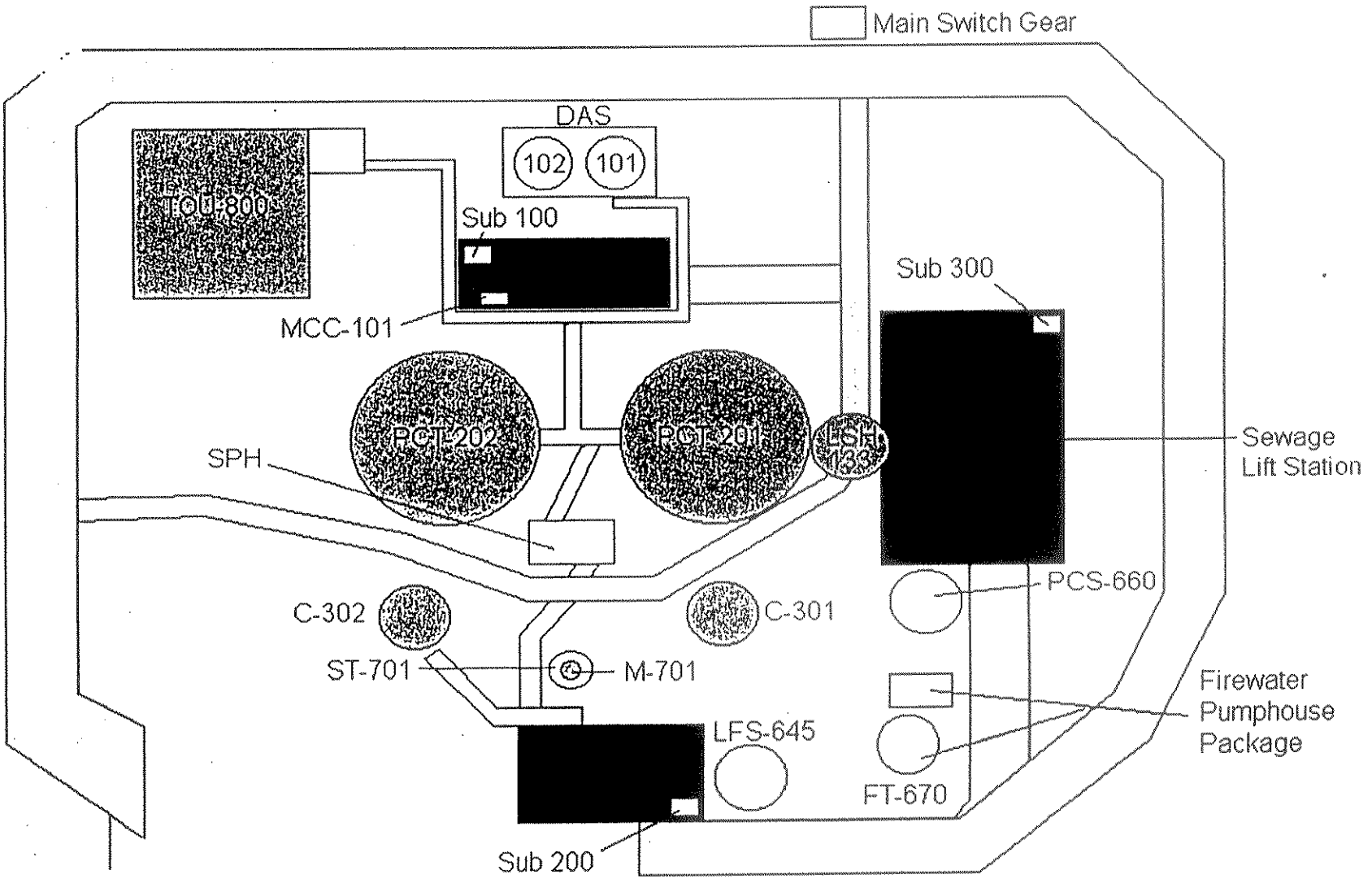
Two separate incoming power sources are provided to allow electricity to be restored to the facility if one supply source is lost. The Main Switchgear is located just outside the site in a secured area maintained by the power company. The two power lines provide electricity to duplex substations located inside treatment facility buildings. As illustrated in Figure 3.1, Sub 100 is located in the Blower Building, Sub 200 is in the Sludge Treatment Building and Sub 300 is in the Groundwater Treatment Building. Figure 3.2 is a one-line diagram showing the electricity distribution network provided at the groundwater treatment facility.

In the event electrical service is lost to the facility, operators may alternate to the second power supply available at each of the three substations. Two large switches are repositioned in sequence to affect this transfer. A single key system is used to allow only one of the switches to be in the closed (operating) position at any time. The original switch to which power has been disrupted will be in the closed position. It will be taken off line by opening the disconnect lever, which allows the key to be turned and removed. The key is then used to unlock the standby power supply which can now be closed to provide electricity to the substation. The key cannot be removed when the switch is in the closed (operating) position. This single key safety system prevents power from back-feeding the line experiencing the power loss, to protect utility workers repairing the line.

Figure 3.1

Ott/Story/Cordova GWTS

Electrical Substation Locations



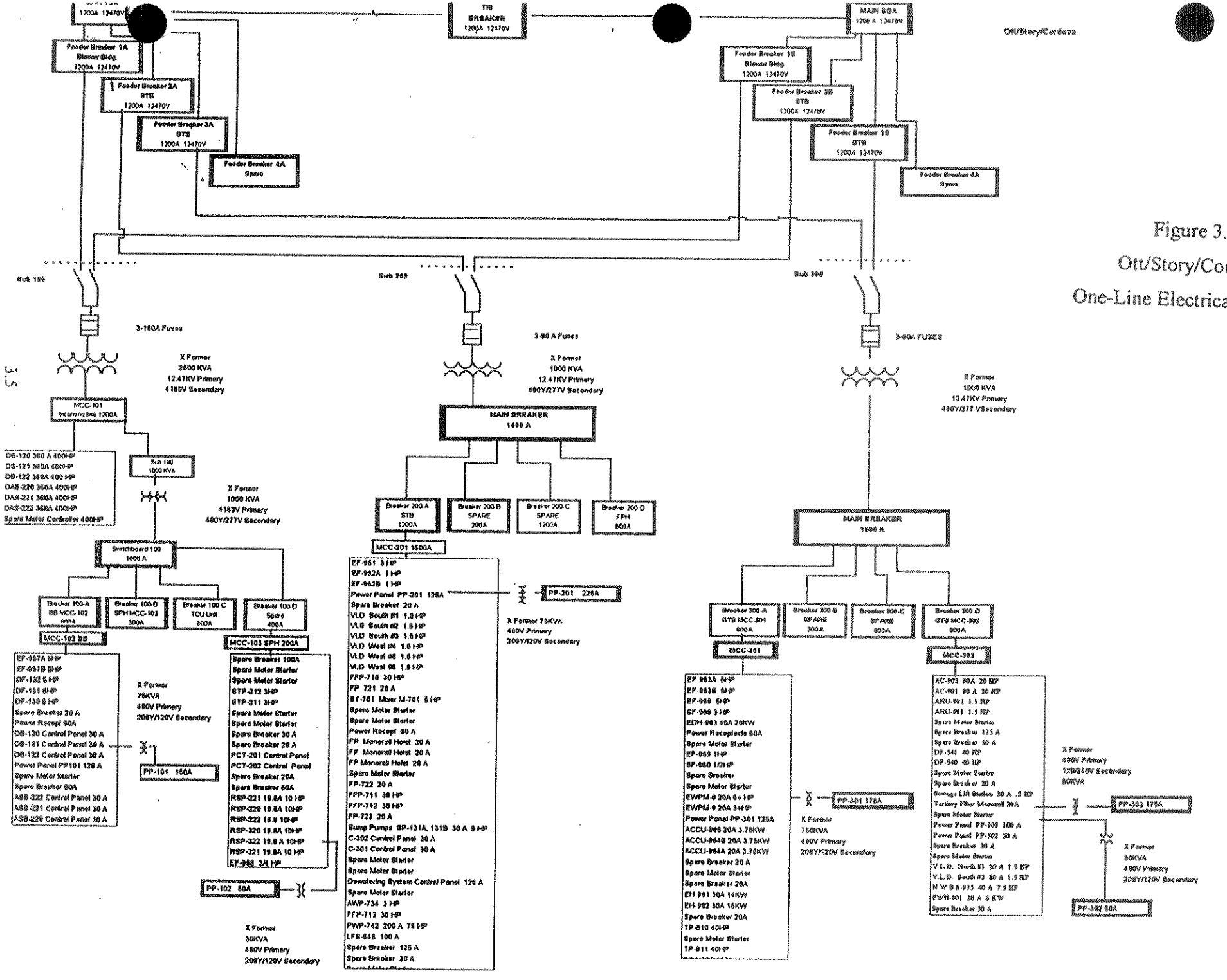


Figure 3.2

Ott/Story/Cordova

One-Line Electrical Diagram

Once power to the facility is restored by alternating power supplies at all three substations, the DCS will restart. A large number of system alarm conditions will exist, but these will be cleared as processes are restarted. First, the Thermal Oxidation Unit (TOU) is started as described in section 5.3.2.4 of this manual, followed by the facility systems start-up summarized in section 5.1.

3.2.2 Fire Alarm System

Fire alarm control at the facility is provided by ESL 1500 Series Control Panels manufactured by Sentrol, Inc. Fire alarm panels are mounted in the Groundwater Treatment Building, the Blower Building and the Sludge Treatment Building. Alarms are initiated by either smoke detectors or heat detectors connected to the control panels. Under normal operating conditions, the green 'AC Power' light is illuminated on the panel. When the alarm is activated, a red 'Alarm' light will illuminate and a continuous, steady audible signal will sound. A remote notification circuit closes under alarm conditions, signaling the Digital Control System (DCS), where the appropriate fire alarm icon is illuminated on the Site Overview screen A1. A facility-wide alarm indicating system is activated which includes an audible alarm and flashing red beacons in facility buildings. An automated dial-out system may also be activated that notifies personnel of the alarm condition by phone. The DCS and autodialer are described in detail in section 5 of this manual.

Fire extinguishers are located throughout the facility and all operators have received instruction concerning the exact location and use of these devices. Any operator responding to a fire alarm must quickly determine if it can be safely extinguished using the available equipment. Otherwise, the local fire department is contacted by phoning '911.'

The fire alarm control panels use two sealed lead-acid batteries as a secondary power source if utility power is lost during the emergency event. Typical battery life is 3 to 5 years. Testing and system checkout functions are available by following the procedures described in the ESL 1500 Installation and Operations Manual available in the operator office. The locations of fire extinguishers and fire alarm stations at this facility are illustrated in Figure 3.3.

3.2.3 Fire Water System

To ensure an adequate supply of water is available on the site to control a fire that cannot be extinguished using the available fire extinguishers, a fire water system has been provided. This system includes a 100,000 gallon water storage tank, an auxiliary pumping system to provide water pressure, and a heating/recirculation system to prevent the stored water from freezing during the winter.

The fire water storage tank is kept filled with water from the public water supply using an altitude switch that senses tank level by measuring static head pressure to maintain a level of 20 feet of water. The main water pump, controls and boiler are located in the enclosed fire pumphouse located next to the storage tank. The fire water system provides water under pressure to fire hydrants located on the site grounds. Fire water system components are listed in Table 3.1.

The fire water pump may be operated in "hand" using a switch on the control panel, however, the typical operational mode is to leave the switch in "auto" and allow the pump to start in response to reduced water pressure in system supply lines.

The boiler provided to prevent stored water from freezing also operates automatically off adjustable temperature controllers set by the operator. A small recirculation pump recirculates water from the storage tank, through the boiler and back to the tank. Operation of the pump is based on outdoor air temperature and is usually set to come on at 35-40° F. A second thermocouple installed in the recirculation line senses the water

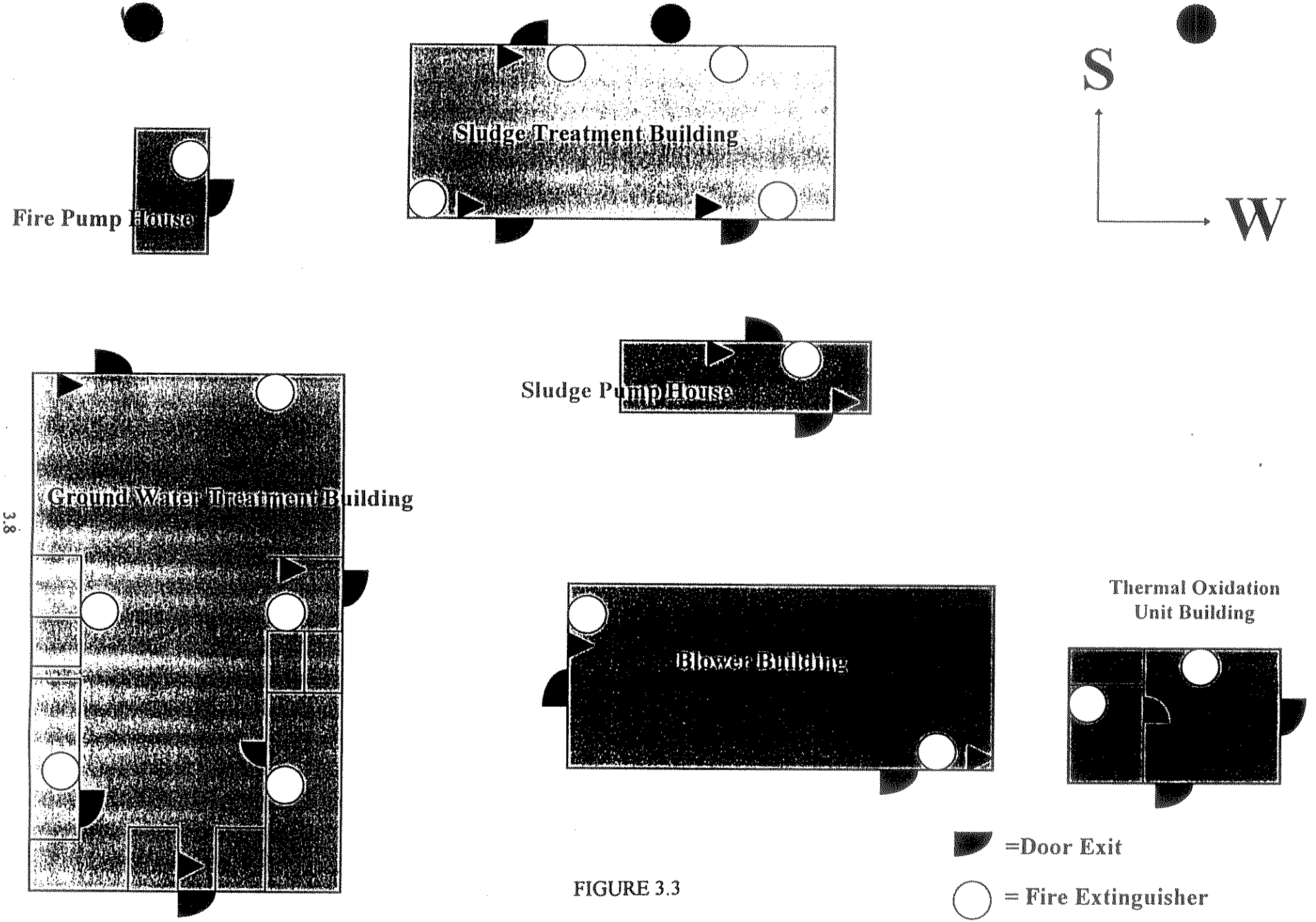


FIGURE 3.3

FIRE EXTINGUISHER & FIRE ALARM STATION LOCATIONS

temperature and a thermostat is set to make the natural gas fired boiler ignite and heat the recirculating water. The thermostat controlling the boiler should be set a degree or two lower than the outside air sensor so the recirculation pump is activated first, because the boiler will not operate unless a flow switch detects water flow through the boiler. For more information regarding the fire water system and controls, refer to the system operations manual located in the operator office.

Table 3.1

Ott/Story/Cordova GWTS

Firewater System Components

Fire Pump (FP-680)
ITT A-C Pump Series 8100 model 150
s/n 951-95252-01-01

Fire Pump Electric Motor
USEM 50 HP, 1775 rpm, 460 V/3 Ph/60Hz
ID #X07X112R079R-3

Fire Pump Electric Motor Controller
Joslyn-Clark Type C10640 Transformer/ Type C10600 Transfer Switch
Cat. #C4B174-4T12 s/n 7305230-1-1

Fire Pump Flowmeter
Gerand Model K-750-6 s/n 3006-93F

Jockey Pump and Electric Motor (JP-681)
Grundfos Model CR2-50U s/n C9523

Jockey Pump Electric Motor Controller
Joslyn-Clark Type 10661 Cat #B1B04-12

Gas-Fired Hot Water Boiler (TWH-691)
Lochinvar model CBN0745 s/n C955207

Circulating Pump and Electric Motor (CP-690)
ITT Bell & Gossett Series 60, 21T H49
ID #172563 s/n 1886883

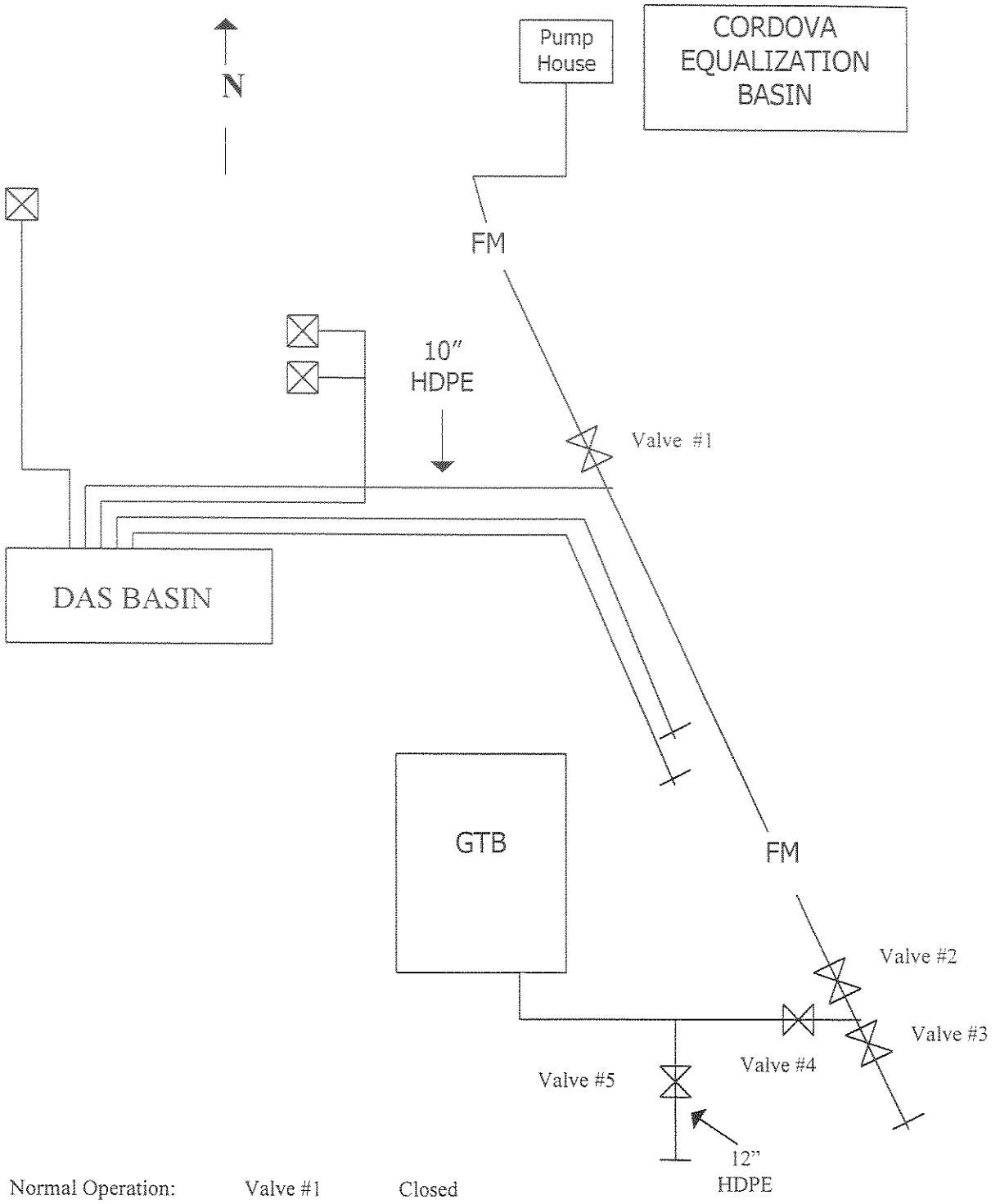
Circulating Pump Electric Motor Controller
Square D Type SBA22
s/n 5889023001

3.2.4 GWTS Recirculation Flow Pattern

Valving and piping has been provided to allow treatment system effluent to be returned to the head of plant processes. The resulting recirculation pattern helps sustain biological processes in the PACT system for up to several days without the addition of nutrients from the groundwater extraction system. Such a condition could arise if operation of all extraction wells was lost, or if the TOU was not functioning, resulting in an extraction well and diffused air stripper shutdown that prevents volatile contaminants from being released to the atmosphere.

The GWTS utilizes a 12 inch diameter high density polyethylene (HDPE) discharge line to pump treated effluent to the Muskegon River. A valve is located on this line just outside the security fence in the southeast corner of the site, up flow from where the plant effluent pipe ties into the Cordova Chemical Company's old discharge line. This valve may be closed and a valve on Cordova's force main prior to the tie-in opened to direct plant effluent to the DAS splitter box. Water is recirculated through plant processes as long as this valving arrangement is maintained. Figure 3.3 illustrates the locations of the valves and their positions for normal operation and the recirculation (bypass) operational mode.

Whenever the recirculation pattern is implemented, the activated sludge blowers must be operated, providing the minimum airflow necessary to maintain mixing and an adequate dissolved oxygen concentration in the PACT aeration tanks. Though usually inoperable due to system interlocks that keep the ASBs from running with the DAS blowers off, these compressors may be started with the control switch in the "local" position after adding a jumper wire between terminals 6 and 7a in the blower control panel.



Normal Operation:	Valve #1	Closed
	Valve #2	Closed
	Valve #3	Closed
	Valve #4	Closed
	Valve #5	Open
Plant in By-pass:	Valve #1	Closed
	Valve #2	Open
	Valve #3	Closed
	Valve #4	Open
	Valve #5	Closed

FIGURE 3.4
GWTS RECIRCULATION FLOW PATTERN

3.2.5 Emergency Response Procedures

Utility suppliers names and telephone numbers are listed on the following page. "Miss Dig" is a service that locates and marks underground utilities and should be contacted prior to any excavation at the site. The City of Muskegon provides potable water to the facility and an interruption of this service will result in an inconvenience for employees by not providing water to the sinks and restrooms. Bottled water dispensers have been provided so drinking water is always available and the laboratory usually has several days of purified water on hand, so a disruption of service should not cause many problems if it is of limited duration. The facility fire water system includes stored water to control fires, but since this system is replenished by municipal water, it is important to quickly restore this supply in the event of an interruption.

Backup electrical service to the treatment facility has already been discussed. There is, however, no alternative electrical power available to the remote extraction wells. An interruption of natural gas to the facility will render the Thermal Oxidation Unit unuseable, and result in the entire treatment system going off line. If the telephone system becomes unavailable, there is no affect on facility operations, but serious communication losses occur. In these three cases, there is little that can be done except to assure the proper utility company makes the necessary repairs and restores service as soon as possible.

Proceeding the utility suppliers phone numbers is a list of emergency equipment available on site, and phone numbers for local emergency responders. These are followed by an emergency call list of personnel familiar with the site and contacts at specific chemical suppliers.

UTILITY SUPPLIERS

MICHIGAN CONSOLIDATED GAS..... 726-4826

EMERGENCY..... 1-800-772-2800

CONSUMERS ENERGY 1-800-447-5050

EMERGENCY..... 1-800-447-5050

MISS DIG..... 1-800-484-7171

GTE TELEPHONE 1-800-483-5600

REPAIR 1-800-483-1000

MUSKEGON CITY WATER/SEWER 726-6718

MAINTENANCE 724-4100

EMERGENCY EQUIPMENT

Fire Extinguishers – Located near each Exit (see Map)

SCBA's (2) – Located in PPE area (GWTB)

First Aid Kits (4) – Located in Controller's Office GWTB, both trucks, Sverdrup Trailer

Respirators – Located in PPE area (GWTB) – All personnel

Level C Suits – Located in PPE area (GWTB) – All personnel

Ladders – Located in all buildings – Extension: 32 ft., 24 ft., step ladder: 8 ft., 12 ft.

Fire Hose in STB – Located in STB – Approximately 250 ft., 1 ½ diameter w/fitting

Air Monitoring – Located in Laboratory – PID, FID, Quad-meters

Davit Arm and Wench – Located in PPE area (GWTB)

(Note: Arm is bolted to heavy steel plate.)

EMERGENCY TELEPHONE NUMBERS

DALTON TOWNSHIP FIRE DEPT. ..... Emergency 911

Business.....766-3043

MUSKEGON POLICE ..... Emergency 911

Business 766-1666

MUSKEGON HAZMAT ..... Contact Dalton Township Fire Dept.

MERCY (MUSKEGON) GENERAL.....Emergency Services..739-3916

Business..... 733-3311

EMERGENCY CALL LIST

In case of emergency the individuals listed below have a working knowledge of the Ott/Story/Cordova groundwater treatment plant and should be immediately contacted:

Fishbeck, Thompson, Carr & Huber

Karl Jaeger..... 231-798-0276
Pager..... 231-339-0342
John Sherman..... 616-847-1673
Pager..... 231-339-0343

Department of Environmental Quality
PEAS Hot Line..... 800-202-4706
Grand Rapids District Office
Spills to Surface Water..... 616-456-5071
Spills to Soils or Groundwater..... 616-246-1720
Lisa Summerfield..... 517-335-3388
Mitch Adelman (daytime #)..... 517-373-8436

Environmental Protection Agency
John Fagiolo..... 312-886-0800
Home..... 312-871-1673
Other..... 312-203-1371

For information on an emergency dealing with a specific chemical use the number listed next to that chemical below. These numbers are also listed on the MSDSs maintained in the Operator Office.

24 Hour Spill or Transportation Emergency
Chemtrec..... 800-424-9300

Powdered Carbon
Norit..... 770-512-4610

Granular Activated Carbon
Norit..... 770-512-4610

50% Caustic Soda
Oxychem..... 800-733-3665
Or..... 716-278-7021

Ferric Chloride
Webb Chemical..... 231-733-2181

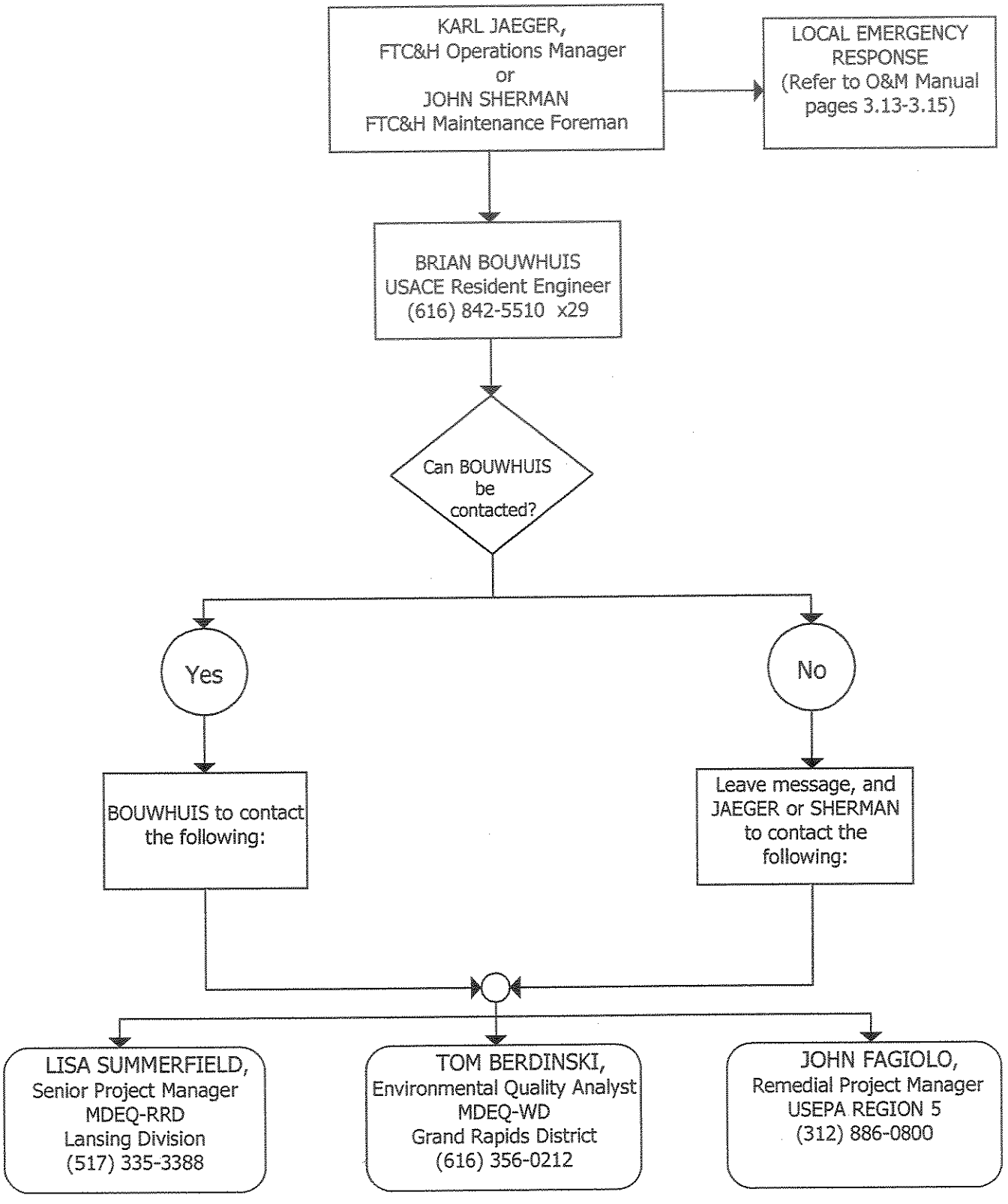
Hydrochloric Acid
DuPont (info)..... 800-441-7515
Medical Emergency..... 800-441-3637

Flocculant
Chemco Products, Inc..... 517-546-7800

Phosphoric Acid
Webb Chemical..... 231-733-2181

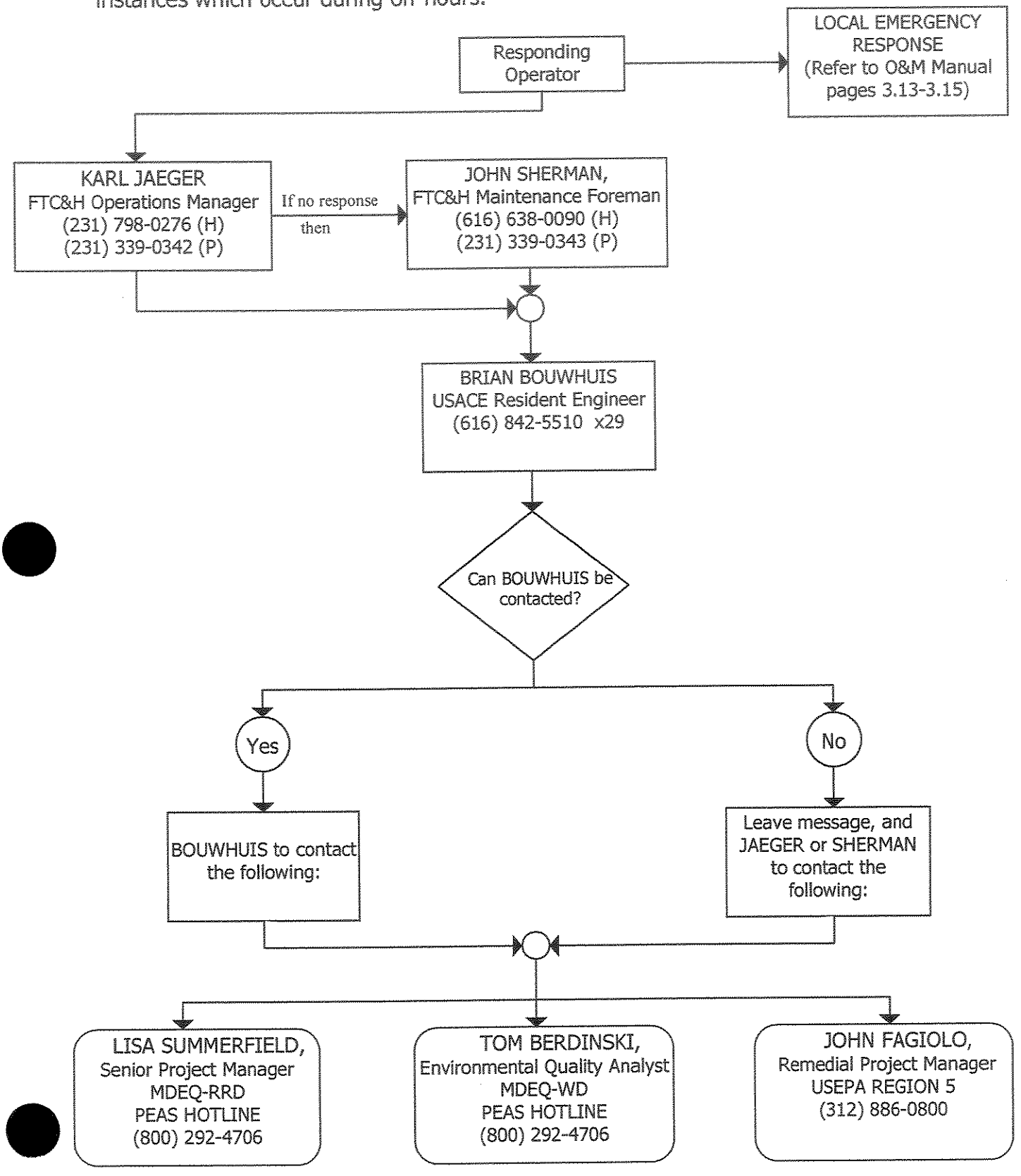
EMERGENCY SHUTDOWN NOTIFICATION LIST
BUSINESS HOURS:

An Emergency Shutdown is defined as an unscheduled plant shutdown in which there is a threat, or perceived threat, to public health or safety. This chart applies to all such instances which occur during normal business hours.



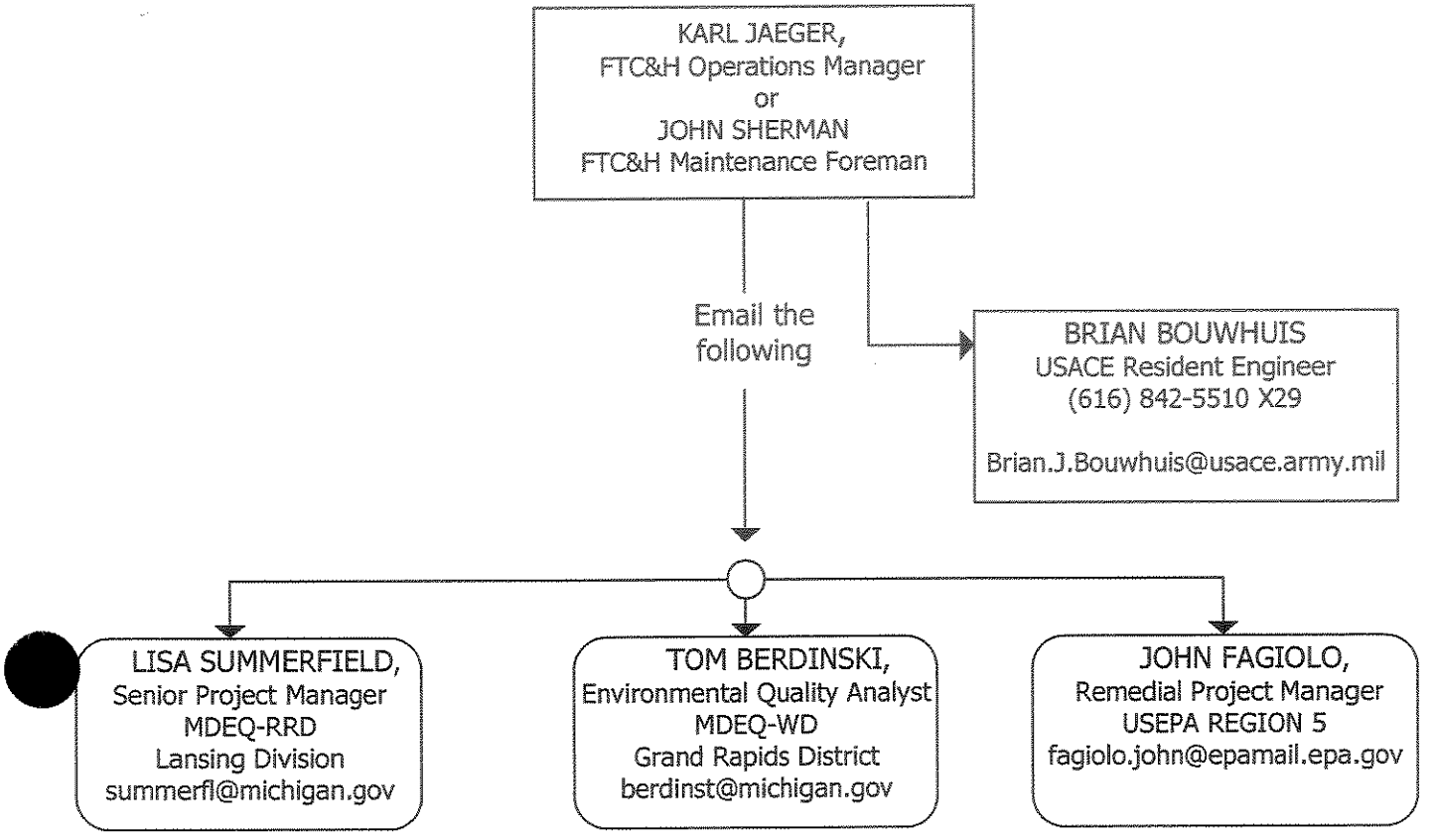
EMERGENCY SHUTDOWN NOTIFICATION LIST
OFF HOURS:

An Emergency Shutdown is defined as an unscheduled plant shutdown in which there is a threat, or perceived threat, to public health or safety. This chart applies to all such instances which occur during off hours.



NON-EMERGENCY SHUTDOWN NOTIFICATION LIST

A Non-Emergency Shutdown is defined as a scheduled and unscheduled plant shutdown in which there is no threat, or perceived threat, to public health or safety. This chart applies to all such instances that occur during normal business hours.



3.3 REPORTING UPSETS, NONCOMPLIANCE AND SPILLS

Procedures for reporting upsets, instances of noncompliance with NPDES permit requirements, and spills are provided in Part II, Section C., paragraphs 5-8 of this facility's NPDES permit No. MI0053309, which is located in Appendix I of this manual.

4.0 TROUBLE ANALYSIS PROCEDURES

This section contains troubleshooting guides for the major processes of the GWES and GWTS. The guides are intended to help diagnose the potential causes of performance-related operating problems or irregularities and identifies possible corrective actions to be selected. As operating experience increases, operators should revise and supplement the information in this section to make the guides most helpful. The information presented here was collected from manufacturer and vendor information, as well as from operational experiences with similar processes at other sites.

The troubleshooting format is divided into three sections. Observation (the problem), Potential Cause, and Corrective Action. The Observation column contains a brief statement of the observed irregularity. The Potential Cause column identifies a possible cause to the observed problem, though not every potential performance problem is identified here. The Corrective Action column lists measures to resolve the potential cause of the problem.

In addition to the observations and responses provided in Table 4.1, copies of equipment manufacturers' troubleshooting guides have been compiled in Appendix D.

Operators should be familiar with the information in these guides and procedures to minimize review time and more quickly identify potential causes of problems. Malfunctions and responsive actions should be evaluated and documented.

TABLE 4.1
GWES AND GWTS TROUBLESHOOTING GUIDE

OBSERVATION	POTENTIAL CAUSE	CORRECTIVE ACTION
Decrease in an individual well yield (flow rate).	Damaged or clogged pump.	Repair or replace pump, as necessary
	Clogged well screen or sediment buildup.	Purge sediments, chemically wash screen, redevelop as necessary
	Mechanical pump wear.	Repair or replace pump.
	Limited precipitation.	Review groundwater levels, adjust pumping rates.
Significant decrease in GWTS influent flow.	Electrical failure.	Identify problem and correct.
	Leak in above or below ground piping	Repair problem as necessary. Shutdown GWES if necesary.
Increase in individual yield.	Equipment malfunction.	Adjust PLC-controlled motor operated valve (MOV.) Repair or replace as necessary.
Erratic flow measurements or loss of flow measurement	Dirty electrodes in magnetic flow meter	Dismantle and clean electrodes with detergent or mild acid solution.
Groundwater overflow from DAS splitter box.	Excessive recycle flow from building sump pumps.	Throttle down sump pump discharge lines or temporarily turn off pumps.
	Blockage in DAS influent line(s).	Clear blockage using snake or compressed air
Groundwater flow from DAS overflow line.	Excessive compressed air supplied from DAS blowers.	Reduce air supply by adjusting system pressure on DB fan control panels.
	Blockage in DAS effluent line(s)	Clear blockage using snake or compressed air.

TABLE 4.1
GWES AND GWTS TROUBLESHOOTING GUIDE

OBSERVATION	POTENTIAL CAUSE	CORRECTIVE ACTION
Low dissolved oxygen concentrations in PACT aeration tanks. (<2.0 mg/L)	Inadequate air supplied from activated sludge blowers.	Increase air supply by adjusting system pressure on ASB control panels.
	Inconsistent air supply to aeration tanks.	Adjust air distribution through tanks using regulating disk valves.
Reduced contaminant removal in PACT process	Food to microorganism ratio is out of range.	Adjust sludge wasting rate to maintain 0.1 to 0.2 F/M ratio.
	Inadequate supply of PAC to second stage aeration tank.	Increase PAC feed by increasing feed time duration.
Air diaphragm PAC pump does not run or runs slowly.	Air inlet screen or air filter plugged.	Clean or replace screen or filter.
	Sticking air valve.	Flush valve with solvent.
	Worn out air valve as indicated by shiny piston face.	Replace air valve.
Air-diaphragm PAC pump runs but no product flow.	Pump cavitation.	Slow pumping rate to ensure product flow.
	Suction connections loose.	Tighten suction connections.
Air-diaphragm PAC pump: Air bubbles in pump discharge or product coming out air exhaust.	Ruptured diaphragm.	Replace diaphragm.
Excessive solids in secondary clarifier effluent.	Improper polymer feed rate to clarifier influent.	Adjust polymer metering pump feed rate.

TABLE 4.1
GWES AND GWTS TROUBLESHOOTING GUIDE

OBSERVATION	POTENTIAL CAUSE	CORRECTIVE ACTION
Phosphorus concentration in effluent approaching or exceeding 0.5 mg/L discharge limit.	Excessive phosphoric acid feed to PACT process.	Adjust phosphoric acid metering pump feed rate.
	Insufficient ferric chloride feed to tertiary filter pump effluent.	Adjust ferric chloride metering pump feed rate.
Excessive differential pressure across lead GAC vessel.	Accumulation of particulates or biomass in GAC vessel is restricting flow.	Isolate and backwash lead GAC vessel. Return to service as lead.
Frequency of backwash of GAC vessels is increasing over time.	Solids passing through tertiary sand filters.	Adjust ferric chloride feed rate to optimize solids removal through sand filters.
Lead GAC vessel effluent contains organic contaminants of concern.	GAC media is saturated.	Isolate vessel and change out carbon. Return to service as lag.
Very rapid increase in headloss across lead GAC after backwash.	Insufficient backwash rate.	Adjust backwash rate and evaluate performance.

5.0 OPERATION

This section provides operating instructions that include the procedural steps necessary to enable operating personnel to use GWES and GWTS equipment to accomplish its specific task. Safety precaution descriptions have been prepared and collected in the Site Safety and Health Plan (SSHP) located in the operator office in the GTB. Operators must be aware of the safety hazards present and how to properly prepare to perform work around them. Reviewing the SSHP and attending weekly safety meetings held at the treatment facility prepare operators to work around these conditions.

5.1 DIGITAL CONTROL SYSTEM (DCS)

Operational control of most GWES and GWTS processes is through the Digital Control System (DCS) computer work station located in the operator office in the GTB. When process equipment is in the preferred automatic or remote mode of operation, pumps and blowers may be turned on or off, certain valves may be adjusted, and flow metering device outputs may be observed. Operation of individual equipment components using the DCS or optional local control mechanisms is described in the following subsections.

The DCS includes a computer central processing unit (CPU), monitor, keyboard, printer, mouse, and wiring connecting the computer with controllers for all the process equipment components. This work station, called an Operator Interface Unit (OIU), is programmed with software prepared by Commerce Controls, Inc. (CCI) that allows the operator to access equipment controllers using a number of graphic screens that appear on the monitor. Process set points and normal operating criteria have been pre-programmed in the software and generally will not be changed by the operator. However, if programming changes are required, technical assistance is available in manuals kept in the operator office, or by contacting CCI.

A list of the screens available through the DCS program is provided as Table 5.1 and a copy of each screen is included in Appendix A. The default screen that appears when the DCS is started is the Site Overview. This screen serves as a menu that allows access to individual system

Table 5.1

OTT/STORY/CORDOVA TREATMENT PLANT

DIGITAL COMPUTER SYSTEM OPERATION SCREENS

Screen ID	Description
SCREEN A-1	SITE OVERVIEW
SCREEN B-1	TREATMENT FACILITY OVERVIEW
SCREEN C-1	FACILITY MISCELLANEOUS AREA
SCREEN D-1	DAS OPERATION
SCREEN D-2	PACT OPERATION
SCREEN D-3	RETURN SLUDGE PUMPS (FIRST STAGE)
SCREEN D-3	RETURN SLUDGE PUMPS (SECOND STAGE)
SCREEN D-4	ACTIVATED SLUDGE BLOWERS
SCREEN E-1	TERTIARY FILTER SYSTEM
SCREEN E-2	EFFLUENT
SCREEN E-3	PHOSPHORIC ACID FEED
SCREEN E-4	FERRIC CHLORIDE FEED
SCREEN E-5	POWDERED ACTIVATED CARBON FEED SYSTEM
SCREEN E-6	VALVE PID CONTROL (Tertiary & Effluent)
SCREEN E-7	POWDERED ACTIVATED CARBON FEED SYSTEM (pump control)
SCREEN F-1	SOLIDS HANDLING SCHEMATIC
SCREEN F-2	SOLIDS HANDLING SCHEMATIC
SCREEN F-3	POLYMER FEED
SCREEN F-4	LIME FEED
SCREEN F-5	FIREWATER SYSTEM
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-1
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-2
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-3
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-4
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-5
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-6a
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-7
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-8
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-9
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-10
SCREEN G-1	EXTRACTION WELL & VAULT EWPM-11
SCREEN H-1	POWER LOGIC BREAKER STATUS
SCREEN I-1	ALARM SUMMARY

components by clicking the mouse on the component's graphic representation. The Site Overview is a map of the groundwater extraction system network (the ten extraction wells, the groundwater collection system, and the valve vaults and control cabinets associated with the remote extraction wells) and the groundwater treatment facility. Start/stop control of the extraction wells is from this screen, as well as alarm acknowledging capability. Clicking on the Groundwater Treatment Facility graphic takes the user to the Treatment Facility Overview, a geographical layout of the GWTS. Access to the individual processes and subsequently to specific pieces of equipment is possible by clicking the mouse on the desired components and proceeding to additional screens. It is possible to place the DCS in an operational mode that allows the viewer to scroll through the screens but restricts access to any of the controls. A new operator could then familiarize himself with the system without the risk of accidentally changing any equipment operating parameters.

The Site Overview Screen includes a number of alarm indicators that turn red and flash when operating parameters exceed the normal range for the particular equipment function. There are additional system responses that notify operators of alarm conditions; namely, an alarm horn in the GTB and revolving beacons that are illuminated inside the various treatment facility buildings. The condition that initiated the alarm is described in text at the top of the Site Overview Screen and printed out on the DCS printer as well. Acknowledging the alarm by clicking on the "ACK ALL" icon on the screen will silence the audible alarm and beacons. However, if no acknowledgement is made during a programmed period of time, a phone dial out system is activated. The RACO auto dialer is programmed with a list of phone numbers and notifies operators that an alarm condition exists at the treatment facility. The dialer will continue through the call list until the call is answered and properly acknowledged. Dialer alarm acknowledgement is accomplished by either pressing the "9" digit on a touch-tone phone or waiting until the alarm message is complete, hanging up, and calling the dialer back within ten minutes. The on-call operator will then go to the treatment facility to address the alarm condition. Programming instructions for the auto dialer are available in the Raco Operations Manual located in the operator office.

Individual alarms are grouped together in a number of sets that activate alarm relays connected to different channels available on the auto dialer. The responding operator will have a general idea of what the alarm condition is based on what channel it is on. The auto dialer channels are connected to the following alarm relays:

Channel 1	General Alarm Extraction System
Channel 2	Fire Alarm GTB
Channel 3	Fire Alarm STB
Channel 4	Fire Alarm BB/SPH
Channel 5	General Alarm GTB
Channel 6	General Alarm STB
Channel 7	General Alarm BB/SPH
Channel 8	Extraction System Zone 1 Leak
Channel 9	Extraction System Zone 2 Leak
Channel 10	Extraction System Zone 3 Leak
Channel 11	Valve 401 Closed
Channel 12	DAS Tank 101 High Level
Channel 13	DAS Tank 102 High Level
Channel 14	Extraction System Zone 4 Leak

A table listing the alarm conditions that each auto dialer channel is connected to, along with typical causes and responses, is provided in Appendix B.

Generally the following procedure should be followed when starting the GWES and GWTS using the DCS. This procedure assumes that process tanks are all full at the time of start-up and process equipment controls are in the automatic or remote mode. All process system valves should be in their normal operating position. Appendix C is a valve schedule listing valve numbers, sizes, locations and normal operating positions.

- The TOU must be operating. TOU parameters are not controlled through the DCS; it has its own operating system located in the TOU Building.

- Start the four clarifier scraper drive units by depressing the "start" button on the appropriate control panel. For the first stage clarifiers, the control panels are next to the bottom of the stairs leading to PACT-201 and 202. For the second stage clarifiers, the control panels are next to the bottom of the stairs leading to C-301 and 302.

- Turn on the desired diffused air stripper blower(s) (DB-120, 121, 122) by clicking on the appropriate "start" icon on screen D1.

- If any DAS by-pass fans (DF-130, 131, 132) are to be used, turn them on by clicking on the appropriate "start" icon on screen D1.

- Initiate a sequenced start of extraction wells EW-1, 2, 3 by clicking on the "start" icon for Extraction Zone 1 on screen A1.

- After EWs-1, 2, 3 are operating (as indicated by red illuminators on the DCS screen) initiate a sequenced start of EWs-4, 5, 6, 7 by clicking on the "start" icon for Extraction Zone 2 on screen A1.

- After EWs-4, 5, 6, 7 are operating (as indicated by red illuminators on the DCS screen) initiate a sequenced start of EWs-8, 9 by clicking on the "start" icon for Extraction Zone 3 on screen A1.

- After EWs-8,9 are operating (as indicated by red illuminators on the DCS screen), start EW-10 by clicking on the "Start" icon for that well on screen G1.

- Turn on the desired activated sludge blower(s) (ASB-220, 221, 222) by clicking on the appropriate "start" icon on screen D4.

- Turn on the desired tertiary filter pump (TP-510, 511) by clicking on the appropriate "start" icon on screen E1.

- Turn on the desired effluent discharge pump (DP-540, 541) by clicking on the appropriate "start" icon on screen E2.

- Turn on the desired ferric chloride feed pump (FCP-600, 601) by clicking on the appropriate "start" icon on screen E4.

- Start the desired polymer feed pump(s) (PFP-620, 621, 622) by clicking on the appropriate "start" icon(s) on screen F3.

- Turn on the desired return sludge pumps (RSP-220, 221, 222 and RSP-320, 321, 322) by clicking on the appropriate "start" icons on screens D3A and D3B.

Flow from the GWES and through the GWTS has now been established. Additional controls are available using the DCS, including selecting feed time intervals for powdered activated carbon and phosphoric acid, and starting pumps for waste sludge transfer from the aerobic digesters to the sludge holding tank. Many system flow rates and totalized flow readings are indicated on the DCS screens as well. The following subsections describe the operation of various system components using the DCS or other alternative control methods.

5.2 GROUNDWATER EXTRACTION SYSTEM (GWES)

The extraction wells and control devices are described in section 1.1 of this Operation and Maintenance Manual. Operators must be aware of the safety precautions presented in the Site Safety and Health Plan (SSHP) concerning working around electrical equipment, including lockout/tag out procedures, particularly in well vaults and remote control cabinets where wet conditions are often present. The well and valve vaults are designated permitted confined spaces and confined space entry procedures must be followed. Air testing and monitoring must be performed prior to entry to assure the atmosphere is safe for breathing. Since physical contact with contaminated groundwater is possible, protective clothing, including a water-proof Tyvek suit, gloves and boots must be worn.

The eleven extraction wells are similar in construction, except for pumping capacities, hp, depth and size. Table 5.2 summarizes some of the extraction well specifications. Electrical power to run the extraction well pumps is provided through individual circuit breakers, which must be closed before any well can be operated. When the pump starting panel, mounted in the EW vault is powered, either the green "off" indicator lamp or the red "on" indicator lamp installed on the panel will be illuminated. To operate the well in the preferred automatic mode, the Hand-Off-Auto control switch must be in the "auto" position.

TABLE 5.2

EXTRACTION WELL SPECIFICATIONS

Well ID	Well Diameter (in.)	Well Depth (ft.)	Screen Length (ft.)	Well Pump (h.p.)	Pump Size (in.)	Design Flow Rate (gpm)
EW-1	8	85.5	60	10	3	100
EW-2	8	86.5	58	10	3	100
EW-3	8	95.0	65	10	3	100
EW-4	8	99.5	73	10	3	100
EW-5	8	95.0	68	5.0	2	85
EW-6a	8	86.0	40	5.0	2	50
EW-7	8	90.5	69	5.0	2	85
EW-8	8	75.5	60	3.0	3	40
EW-9	8	150	63	1.5	2	15
EW-10	6	76.5	30	1.5	2	40
EW-11	8	75.0	30	3.0	2	40

By using the control panel in the extraction well vault, the well pump can be turned off by moving the switch to the "off" position. The well can be turned on by moving the switch to "hand", but, when placed in "auto", the pump can only be started from the DCS work station in the operator office. Prior to starting any well pump, the operator must verify that both the motor operated valve (MOV) and manual ball valve on the discharge line in the vault are in the "open" position. As well as the sequenced well start-up procedure described in section 5.1, each EW has

its own individual screen in the DCS software program. The well pump can be turned on and off by clicking on the appropriate icon on this screen, but cannot be turned off using the DCS if the selector switch is in "hand."

When a well pump is operating, the groundwater discharge flow rate may be observed on the magnetic flow meter mounted on the discharge line in the vault. This value, along with a totalized flow reading, is also provided on the DCS graphic screen. Although using the "reset" icon on the computer screen allows the flow totalizer there to be reset to zero, the actual totalized flow value is retained on the flow meter itself.

A three-electrode level sensing system is installed in each well. The electrodes are suspended from the top of the well cover at the different depths given in Figures 1.2 through 1.10B. The uppermost electrode is set at the water high level, the second at the water low level, and the third is a reference electrode that must always remain submerged in water in the well. Before a well pump can be started in the automatic mode, all three electrodes must be submerged. During pumping, water level in the well may drop below the high level electrode without affecting operation, however, if the water level drops below the low level electrode, the Water Low Sensor (WLS) alarm is activated through the DCS and the pump shuts off. This prevents the well pump from running dry which will cause the motor to over-heat. The pump will restart when water in the well rises to the high level electrode again.

If the groundwater flow through the well screen becomes obstructed, the well pump may cycle on and off frequently. This condition will result in erratic flow rates to the GWTS which may affect treatment efficiency, and also could damage the pump and motor. Corrective action described in the maintenance section of this manual should be taken if this cycling condition occurs. In addition, if the pump is operated in the 'hand' mode, the low level alarm is still activated through the DCS, but the well pump will continue to run even under low water level conditions. The "hand" mode should, therefore, be used only temporarily when checking out the extraction well operation.

Extraction well flow is regulated using the programmable logic controllers (PLCs) for each EW that are located in the appropriate control cabinet (CC-1, CC-2, or CC-301). For EW-10 and EW-11, the PLCs are in the above-ground enclosures. The PLCs control the positioning of the MOVs on the well discharge lines. These controllers also have "hand" and "auto" modes which are selected using push buttons. When operated in hand, the PLC allows the operator to select the percentage the valve is open and observe the resulting flow rate. For example, if the valve is regulated to 50% open, the flow rate may be 65 gpm. The valve positioning is adjusted in "hand" mode to give the desired flow rate. When this value is achieved, the controller is changed to "auto" using the push buttons and the programmed flow rate is maintained as the PLC automatically regulates the MOV. If left in "hand", the MOV remains in the selected position, regardless of any flow rate changes that occur. Other programmable functions are available on the PLC, such as how quickly the MOV is adjusted in response to a change in flow, however, after initial set-up, these functions generally do not require adjustment. Operators will only affect changes in well flow rates using the PLCs when directed to do so by the facility owners, currently the USACE and MDEQ.

Each extraction well vault is equipped with float switches to detect the accumulation of water in the vault. As the water level rises, the float is elevated, closing an electrical circuit through the switch and activating the Sump Level Switch High (SLSH) alarm through the DCS. If the water in the vault continues to rise, a second, higher switch is activated that shuts the extraction well pump off. If the water in the vault is due to a broken pipe or leaking fitting in the pump discharge line, shutting the well down will prevent water from reaching electrical equipment in the vault. Often, water in a vault is the result of rainwater or melting snow entering through gaps in the cover, but operators responding to a high vault sump level alarm should come prepared to encounter contaminated groundwater. Water in an extraction well vault is removed using a portable pump and pumping into a storage tank which is brought back to the treatment facility where the water is introduced into plant processes. Responding operators inspect the EW plumbing for leaks and make any necessary repairs.

There are no vaults associated with EW-10 and EW-11, as all valving, electrical, and instrumentation components are installed at ground level. Concrete containment walls about six

inches in height are provided to prevent the release of water from piping leaks. This containment area must be visually checked at least once a week. Any accumulated water is most easily removed by using a wet vac. The space between the double-walled discharge lines exiting the containment areas are exposed to allow leaks to drain into it before the level can rise high enough to overflow the containment walls. This flow, in addition to leaks that are captured along the length of the buried double-walled piping, flow into a manhole just inside the northwest corner of the treatment facility perimeter fence. Two float switches are mounted inside the manhole. If the lower float is activated, a Zone 4 high level alarm is sent to the DCS computer and the autodialer. If the leak continues and the higher float switch is activated, a Zone 4 high high level alarm occurs that shuts down EW-10 and EW-11. All leaks, regardless of how small, must be immediately corrected to prevent exposure to contaminated groundwater.

Shutdown of the extraction wells is accomplished from the DCS by clicking on the "stop" icon for each of the three extraction zones on the site overview screen (A1). All well pumps within the selected zone will turn off simultaneously. An individual extraction well may be turned off by selecting the associated screen and clicking the "stop" icon. An extraction well can only be turned on and off at the DCS work station when the selector switch in the vault is in the "auto" position. When an individual EW is to be off for any length of time, the manual valve on its discharge line must be closed to prevent water pumped by the operating extraction wells from entering the well that is not running.

Standby electrical generators have been provided to supply power to operate the seven remote extraction wells in the event utility power is not available. The wells should only be operated using standby power when the treatment facility is running normally. Operating instructions for the standby generators are in Section 3.1 of this Manual. Electrical power to EWs 8-11 is provided by the same two sources available to the treatment facility.

5.3 GROUNDWATER TREATMENT SYSTEM (GWTS)

Descriptions of the GWTS components are provided in section 1.2 of this Operation and Maintenance Manual. The process flow diagram illustrated in Figures 5.1A and 5.1B shows the normal pattern of flow through the treatment processes. This subsection provides operating instructions to enable operating personnel to use GWTS equipment.

5.3.1 Diffused Air Strippers (DAS)

The diffused air strippers (DAS) containment area is a designated exclusion zone and must only be entered by operators properly trained in hazardous material handling. Entry into the DAS containment area is required for sample collection and to adjust manual valves or to address operational problems with the stripper basins or plumbing. Due to the potential presence of volatile contaminants in this area, an air purifying respirator (APR) must be worn with cartridges that filter out organic contaminants. Since physical contact with contaminated groundwater is possible, protective clothing, including a water-proof Tyvek suit, gloves and boots must be worn when entering this exclusion zone. Refer to the SSHP for specific safety instructions concerning working in exclusion zones.

5.3.1.1 Diffused Air Stripper Basins

Groundwater flow to the DAS basins from the extraction wells enters the flow splitter box located between the two tanks. Water elevation in the splitter box is higher than the level maintained in the basins, so flow through the strippers is by gravity. With system valves in their normal operating positions as listed in Appendix C, groundwater from the three extraction zones combine into a single inlet pipe that enters the flow splitter, then flows over concrete weirs into the two basins. Compressed air bubbles up through the tanks, stripping volatile contaminants from the water. Treated water exits the tank with flow from DAS-101 proceeding on to PCT-201 and flow from DAS-102 going to PCT-202. Process air that collects at the top of the basins is drawn into the TOU.

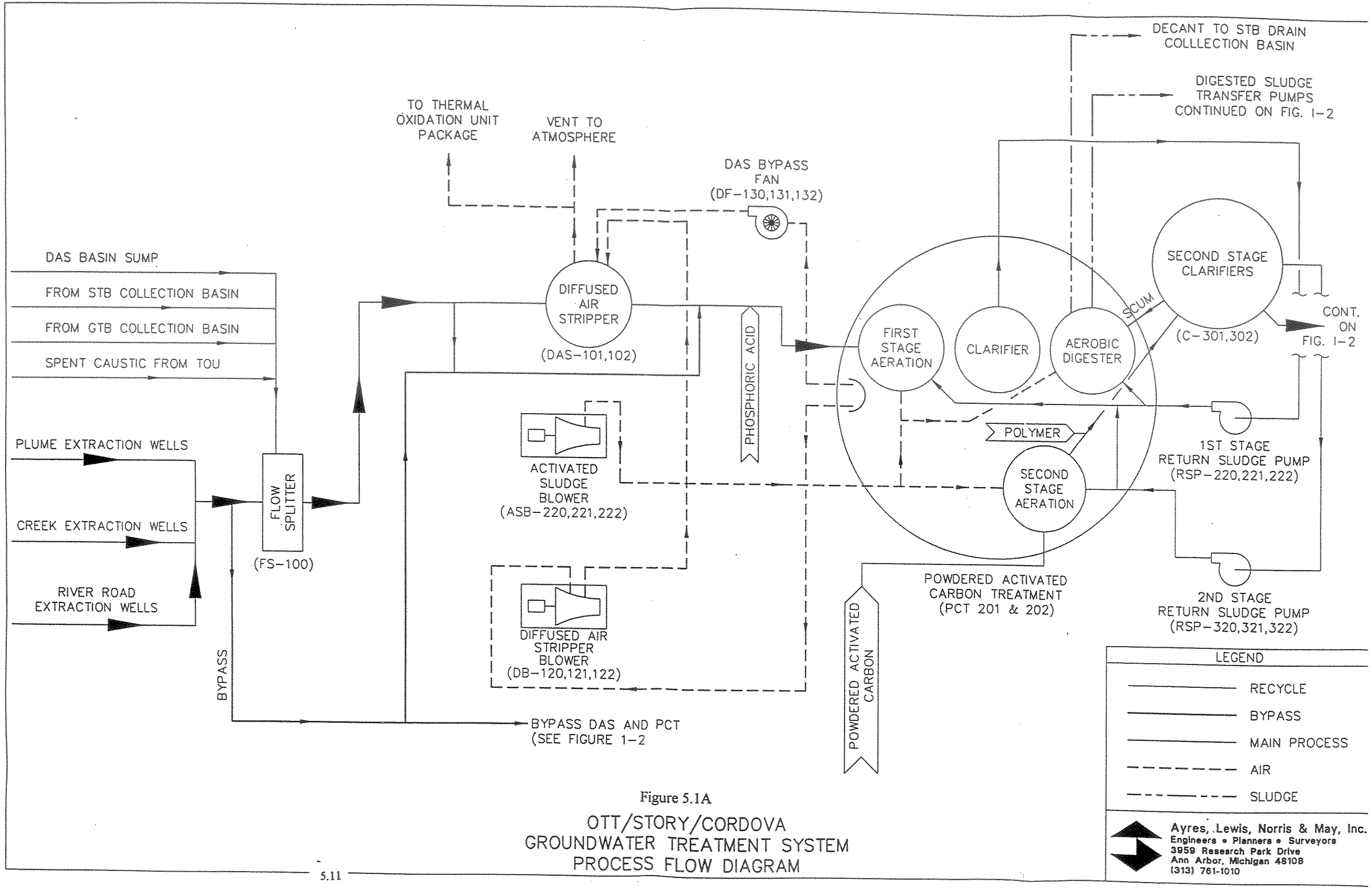


Figure 5.1A

OTT/STORY/CORDOVA
GROUNDWATER TREATMENT SYSTEM
PROCESS FLOW DIAGRAM

P:\PROJ\89289-(_OW Fri Aug 01 11:08:12 1997 AL

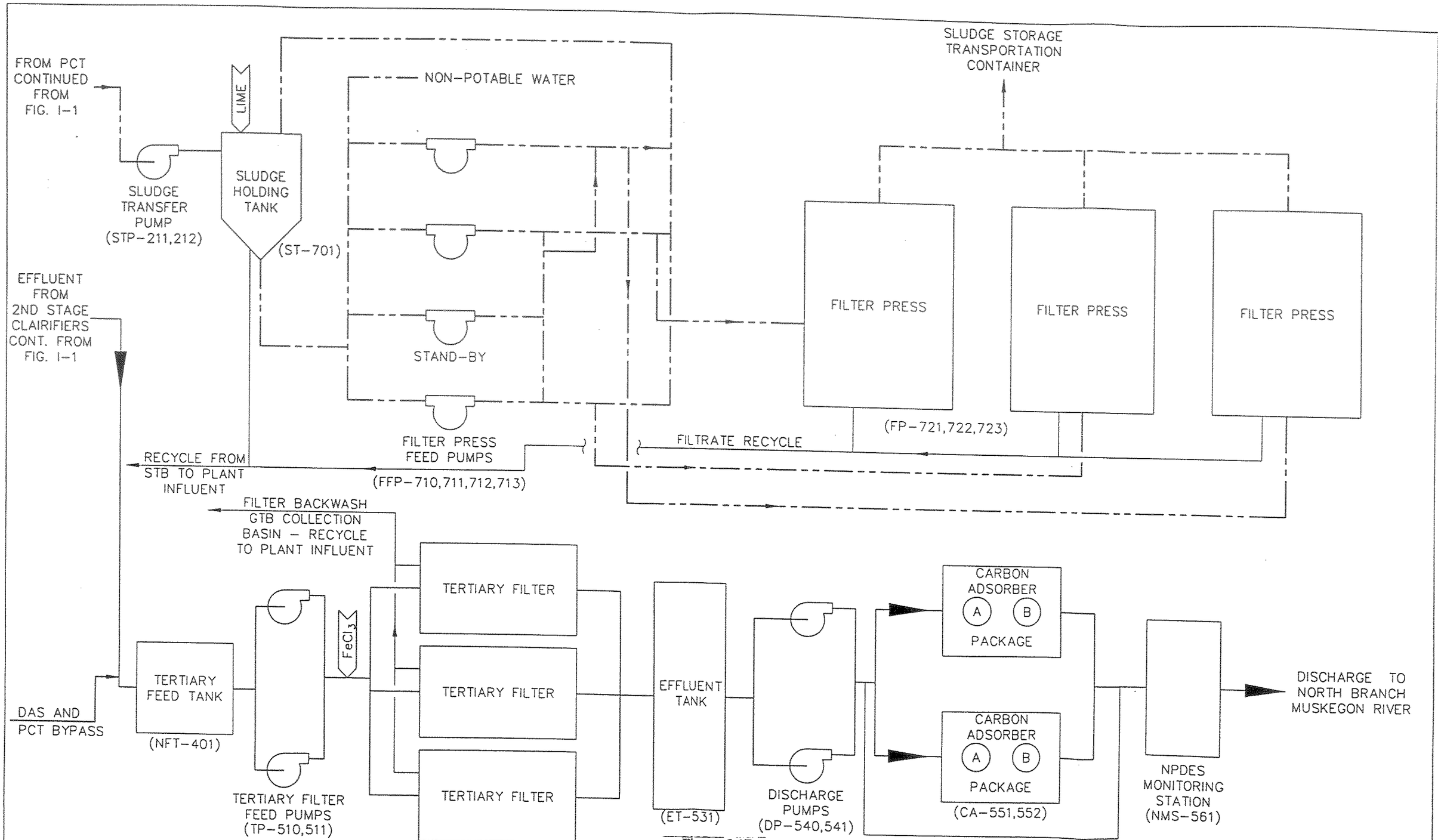


Figure 5.1B

OTT/STORY/CORDOVA
GROUNDWATER TREATMENT SYSTEM
PROCESS FLOW DIAGRAM

Ayres, Lewis, Norris & May, Inc.
Engineers • Planners • Surveyors
3959 Research Park Drive
Ann Arbor, Michigan 48108
(313) 761-1010

P:\PROJ\8 .OW Fri Aug 01 11:14:43 1997 AL

The concrete containment area enclosing the DAS basins has a sump that collects tank overflows, leaks from piping and rainwater. An air diaphragm pump located in the adjacent blower building is operated as necessary to pump out the sump. With the pump inlet and outlet valves open, the pump is started by opening the compressed air inlet valve and providing 40 psi air to the valving arrangement that causes the dual diaphragms inside the pump to stroke back and forth. Check balls serve to direct flow to the discharge line and prevent reverse flow through the pump. More information concerning operation of the Wilden air diaphragm pump is available in the manufacturer's O&M manual in the operator office. Flow from the DAS basin sump goes directly to the flow splitter box, as do discharges from the GTB and STB buildings drain collection basins.

Alternative flow patterns may be implemented using the manual valves provided in the DAS system piping. Locations of the valves are identified in the facility as-built drawings and the valves are tagged in the field to provide their ID numbers as well. The valves provided are totally enclosed butterfly valves with gear actuators and handwheels that are operated manually. Groundwater flow enters DAS-101 from the flow splitter through valve V-101A and exits through V-101B and on to PCT-201. Groundwater flow enters DAS-102 from the flow splitter through valve V-102A and exits through valve V-102B and on to PCT-202. In order to bypass the diffused air strippers, valves V-109 and V-110 are opened and valves V-101B and V-102B are closed. Volatile contaminants are still removed by air stripping in the PACT system aeration tanks, but contaminated air flow from the PCTs, through the DAS basins and on to the TOU must be maintained to prevent these contaminants from being released to the atmosphere.

Float switches have been installed in the flow splitter box and the DAS basins that are actuated when high levels develop in these system components. High flow conditions may be experienced when all wells are operating and return flows from the various sump pumps is excessive. Under these circumstances, the high water level alarm is usually only temporary, however, if the level in the flow splitter box continues to rise and activates a second high-high level switch, the extraction wells will shut off to prevent flooding in the DAS system. All alarm conditions are tied into the DCS, which illuminates the DAS icon with a red flashing indicator,

activates the facility audible alarm, initiates the dialer if the alarm is not acknowledged in the Site Overview screen, and records the alarm condition on the DCS printer.

5.3.1.2 Diffused Air Stripper Blowers

The DAS blowers, located in the blower building adjacent to the DAS basins, provide compressed air to the diffusers in the bottom of the DAS tanks. The blower building is a restricted area where ear protection is required because of the high noise level inside. High voltage electrical equipment is located here and operators must follow the lock out/tag out procedures described in the SSHP prior to working on electrical equipment. High speed rotating shafts and impellers mandate that extra caution be used in the blower building and protective eye glasses are required.

During normal operation, blower DB-121 draws air from the domed PCT-201 structure and directs it to DAS-101, while DB-122 draws air from PCT-202 and pumps into DAS 102. The blowers may be turned on by positioning a switch on the control panel mounted next to each blower in the "local" position and depressing the "start" button. However, when the blowers are operating in this mode, they do not shut off if the TOU stops running and volatile contaminants will be released to the atmosphere. For this reason, the preferred mode of operation is to position the blower control switch in the "remote" setting and then turn the blower on by clicking on the "start" icon for that blower at the DCS work station.

The DAS fans are operated and monitored from the DAS Operations screen (D1) which has graphic representations of the blowers along with totalizers that indicate run hours for each compressor. When a blower is running, it is illuminated in red on this screen. If an alarm condition exists, the red illumination flashes on and off. Only start and stop functions are available on the DCS. Additional process control features are available on the individual blower control panels. A programmable logic controller (PLC) is provided for each blower. The controller allows input for several operating parameter limits (system air pressure, air temperature, oil pressure, oil temperature, vibration, and motor current). In addition, the PLC records the hours the unit has operated and the number of times it has been started. During start-

up of the blowers, operating ranges for these parameters were entered into the controller. If any operating conditions exceed the ranges specified, an alarm is activated and the blower shuts off. Most of the parameters do not require any adjustment by facility operators, but one, the system air pressure, is used frequently to adjust air flow rates to the DAS basins.

Each blower has a compressed air-operated regulating valve on the inlet duct. A second regulating valve is mounted on the blower discharge and diverts air from the system through a pipe that runs outside and vents to the atmosphere. This process is called "unloading" and there is a switch position on the blower control panel labeled "un-load" that allows the blower to be operated without sending compressed air to the DAS system (it is all vented outdoors). The PLC maintains the programmed system pressure level by throttling or opening these two valves. Closing the inlet regulating valve decreases the air volume delivered to the blower and decreases system pressure, while opening the valve increases air flow and pressure. System pressure drops when the unloader valve opens and rises as the valve closes. The PLC operates the two valves together to maintain the desired pressure with the greatest energy efficiency.

Each DAS blower has a capacity of 5500 cfm at the design pressures expected in this system. However, it was discovered during system start-up that excessive air flow rates into the DAS basins will cause water in the tanks to overflow. The maximum air flow rate to the basins to prevent overflow is about 1800 cfm. Air flow rate to the basins is controlled by adjusting system pressure on the blower PLC. Air flow meters mounted in the ducts leading to the two DAS tanks provide a digital readout of flow rates on the blower control panels. The following steps allow the operator to set the system pressure that maintains the desired air flow:

- Turn the keyed switch on the control panel from "run" to "program".

- Use the up and down arrows to arrive at "System Pressure" on the PLC menu. The system pressure (for example, 7.5), in psi, will be displayed.

- Observe the metered air flow rate displayed on the control panel (for example, 2000) in cfm.

- Depress the button on the PLC labeled "cycle" which enables the programmer to accept input.

- Use the up and down arrows to adjust the system pressure while observing the air flow rate. In this example, system pressure is lowered by depressing the down arrow button. The desired air flow rate of 1800 cfm might be achieved by lowering the system pressure to 6.5 psi.
- When the desired air flow rate is attained, depress the "set point" button and return the keyed switch to the "run" position. The PLC will adjust the inlet and unloading valves in order to maintain the programmed system pressure set point.

Other set point values are programmed in a similar manner. Refer to the Ingersol-Rand blower operations manual (submittal numbers 583.1-15804-701 and 583.1-15804-703) for additional instructions for operating this system.

Compressed air to operate the regulating valves as well as the Wilden air diaphragm pump that pumps water from the DAS containment area sump is supplied by two Ingersoll-Rand two-stage duplex high pressure air compressors located inside the blower building. The compressors are each driven by a 20 hp electric motor and store compressed air in a 240 gallon receiver tank. These compressors are labeled BBAC-903 and BBAC-904 and provide air at 150 psi pressure. A refrigerated air drier is installed in the receiver tank outlet line to remove moisture from the air before it is used by the blower valves and pump.

Along with DB-121 and DB-122, a third blower, DB-120, is provided that may be used to send compressed air to either DAS basin. DB-120 is considered a standby blower to be used when either of the other two blowers is down for maintenance. During normal operations, air flow from DB-121 is directed to DAS-101 through valve V-126. Air flow from DB-122 is directed to DAS-102 through valve V-123. To use DB-120 to provide air to DAS-101, valve V-125 is opened and V-126 closed. To use DB-120 to provide air to DAS-102, valve V-124 is opened and V-123 is closed. Since the blower capacities far exceed the air flow requirements of the DAS basins, another acceptable operational mode is to use DB-120 to provide air to both basins.

This is accomplished by closing valves V-123 and V-126 (from DB-122 and DB-121) and opening both valves V-124 and V-125. Flow rates to both basins may not be equal, so manual adjustment of either V-124 or V-125 may be required to regulate air flow rates to the DAS tanks.

Typically, control switches for the DAS blowers will be maintained in the "remote" setting and blowers will be turned off from the DCS work station. When alternating blowers, the second blower should always be turned on before the first is shut off. The activated sludge blowers (ASBs) providing air to the PACT aeration tanks will not operate without a DB blower on, in order to prevent contaminated air from being released to the atmosphere.

5.3.1.3 Diffused Air Stripper Bypass Fans

The DAS bypass fans (DF-130, 131, 132), located outdoors south of the blower building, draw air from the domed PACT multi-purpose tanks and direct it to the air space at the top of the DAS tanks. Since the volume of air pulled out of the PACT must always exceed the volume going in (to prevent the release of contaminants to the atmosphere), the bypass fans can be used to increase PACT tank ventilation without exceeding DAS diffuser capacity. For instance, if the activated sludge blowers are providing air to the PACT aeration tanks at 2500 cfm, and the DAS blowers are operating at the highest allowable rate of 1800 cfm, the bypass fans must be used to draw off at least an additional 700 cfm to prevent contaminated air from escaping the PACT structures. Each DF fan has a capacity of about 1500 cfm, but may be regulated to provide the desired rate.

Each DF fan is equipped with an electrical disconnect and a hand/off/auto switch that allows local control of the fan. When operated in "hand", the fan cannot be turned off through the DCS. When operated in "auto", the fan can only be started from the DCS. Normal operation involves leaving the switch in "auto" and controlling the fan from the DCS DAS Operations screen (D1). A graphical representation of each DF fan is provided with "start" and "stop" icons that are clicked on using the mouse to operate. Any DF fan running is illuminated in red. Air flow meters have been installed on the bypass fan discharge lines inside the blower building. Desired

air flows are obtained by manually regulating the DF fans discharge valves (V-131B and V-132B) and observing the resulting air flows on these meters.

Typically, DF-131 draws air from PCT-201 through valve V-131A and directs it through valve V-131B to DAS 101. DF-132 draws air from PCT-202 through valve V-132A and directs it through valve V-132B to DAS-102. Regardless of which operational mode is used, emergency stopping of any DF fan can be quickly accomplished locally by turning the control switch to "off" or opening the electrical supply disconnect. DF-130 is a standby fan that can be used in place of either DF-131 or DF-132. To operate DF-130 in place of DF-131, inlet valve V-130B and outlet valve V-130D are opened, and inlet valve V-131A and outlet valve V-131B are closed. To operate DF-130 in place of DF-132, inlet valve V-130A and outlet valve V-130C are opened and inlet valve V-132A and outlet valve V-132B are closed.

5.3.2 Thermal Oxidation Unit (TOU)

Thermal Oxidation Unit (TOU) controls are not accessible using the DCS, but are located in the TOU building located next to the unit. TOU alarms, however, are connected to the work station and give the typical alarm notifications (audible, beacons, and dialer call-out if alarm remains unacknowledged). Alarm indication is provided to the DCS monitor on the Treatment Facility Overview screen (B1), where the icon labeled "TOU-800" will be illuminated in red and flash on and off if a TOU alarm condition exists. Table 5.3 lists the TOU alarms and system responses.

TOU system controllers are mounted on the face of the TOU control panels in the TOU building. Most operating parameters were input during system start-up and do not require adjustment by operators. Readouts from system monitors, including temperatures, flow rates, pressures, and scrubber water pH are available on the control panel. Deviation from normal operating ranges generally result in an alarm, but daily monitoring of these parameters allows recognition of changes or trends that can be addressed before system shutdown occurs.

Table 5.3

TOU ALARMS AND ACTIONS

ALARM	ALARM DESCRIPTION	SHUTS DOWN TOU	RESULT
1	Valves not turning	Yes	Shuts down fan
2	Main exhaust fan not running	Yes	TOU shuts down
3	Comb blower not running	No	Shuts down burner
6	Excessive exhaust temperature	Yes	Shuts down fan
6	Excessive chamber temperature	Yes	Shuts down fan
7	RTO not at temperature	No	Isolation valve closes TOU goes to standby
8	Burner ignition failure	No	Burner does not light
10	Burner low gas press	No	Shuts down burner
11	Burner high gas press	No	Shuts down burner
12	Burner low comb air	No	Shuts down burner
14	Burner flame failure	No	Shuts down burner
15	Burner failure	No	Alarm only
16	Two burner failures	No	Alarm only
17	Purge not complete	No	RTO needs to be reset and repurged
18	No flow through oxidizer	Yes	Shuts down TOU
19	Pre-start purge	No	Alarm only
20	System isolation damper malfunction	No	Alarm only
21	No water in quench	No	Alarm only
22	Quench high inlet temp	Yes	Shuts down TOU
23	Low low recycle tank liquid	Yes	Shuts down TOU
24	High high recycle tank liquid	Yes	Shuts down TOU
25	No recycle flow to scrubber packing	Yes	Shuts down TOU
26	No fresh water flow to quencher	Yes	Shuts down TOU
27	No recycle flow to quencher	Yes	Shuts down TOU
28	No recycle flow to packed bed nozzles	Yes	Shuts down TOU
29	High high caustic tank liquid	No	Alarm only
30	High high waste tank liquid	No	Alarm only

High temperatures are utilized in the TOU system processes and though most of the hot duct is enclosed in insulation, operators should take care when working around this equipment and avoid contacting hot surfaces. High noise levels in the TOU building housing the exhaust fan require that ear protection be used when entering this area. Eye protection is required due to the various moving parts of the fans and pumps, and additional personal protection (rubber gloves and face shield) should be worn when working with the caustic solution feeder and recirculation pumps to prevent chemical burns. Refer to the SSHP for specific instructions concerning protective equipment.

5.3.2.1 TOU Exhaust Fan

The TOU exhaust fan pulls air from the DAS basins, through the demister, regenerative thermal oxidizer (RTO) and caustic scrubber and exhausts the treated air to the atmosphere. To prevent the release of contaminated air prior to treatment, the entire system must be maintained under vacuum. The TOU exhaust fan air flow volume must, therefore, exceed the combined air flows into the DAS tanks from the DB and DF fans. The exhaust fan air pumping capacity is 11,000 cfm.

The exhaust fan motor is driven by a variable frequency drive (VFD) located inside the control panel. Operation of the VFD is allowed in either "manual" or "auto" control modes selected using a switch on the control panel. In manual, the exhaust fan motor speed is controlled by rotating a dial calibrated in % speed. Once adjusted, the motor speed remains constant regardless of system pressure or vacuum, so it is possible that exhaust air flow may not be high enough to prevent contaminated air from being released to the environment. On the other hand, if motor speed, and thus exhaust air flow, greatly exceeds the volume coming off the DAS basins, system efficiency declines because the electricity requirements to drive the fan motor is greater and the amount of natural gas fuel needed to maintain combustion chamber temperature increases. For these reasons, the TOU exhaust fan should be operated in the "auto" mode which provides automatic variable speed control of the motor.

Automatic variable speed control of the exhaust fan motor is accomplished using a programmable logic controller (PLC) that regulates the VFD in response to the vacuum pressure present in the TOU inlet duct. Plastic tubing extends from the inlet duct next to the demister to the PLC through a manometer which registers the vacuum pressure present. Up and down arrow keys on the PLC allow the operator to select the inlet vacuum pressure that draws off-gases from the DAS basins at a rate sufficient to prevent the release of contaminants to the atmosphere. At the current air flow rate of 3600 cfm of air entering the DAS basins from the DB blowers and no DF fans operating, a vacuum of 2.0 inches W.C. maintains the desired draw off of DAS off-gases. If air flow to the DAS tanks is increased, the vacuum may have to be adjusted upward to achieve the required DAS basin ventilation rate.

5.3.2.2 Regenerative Thermal Oxidizer (RTO)

Contaminated air drawn from the DAS basins is directed in and out of the three RTO recovery chambers according to the current position of flow control valves on the system's inlet and outlet ducts. A single drive shaft, rotated by a DC motor and attached to the valves by cams, opens and closes the valves at a rate established during system start-up. This rate was set to deliver flow through alternating recovery chambers every 40 seconds. Although the shaft rotation speed is adjustable using a DC motor speed control dial on the control panel, this parameter is usually not adjusted by operators.

As previously described in section 1.2.2.3 of this manual, contaminated air drawn through ceramic media is pre-heated in the recovery chambers on its way to the combustion chamber. The oxidized air from the combustion chamber than reheats the ceramic media on its way out through the recovery chamber when in the exhaust mode. Two natural gas burners provide the thermal energy required to maintain the desired temperature of 1800° F in the combustion chamber. Two PLCs, each one associated with one of the burners, are located on the control panel and allow adjustment of the combustion chamber temperature using up and down arrow buttons. The temperature setpoint selected is automatically maintained by the PLC by controlling the natural gas supply to the burners. Operators do not affect any changes in the combustion chamber temperature, unless directed to do so by the USACE or MDEQ. These

agencies will determine if a temperature change should be implemented based on contaminant concentrations in the TOU exhaust.

5.3.2.3 Caustic Scrubber

Thermally oxidized gases from the RTO are drawn into the caustic scrubber that removes hydrochloric acid (HCL) from the exhaust air before it leaves the system and is delivered into the atmosphere by the TOU exhaust fan. HCL is a combustion product of chlorinated hydrocarbons present in the DAS off-gas and is an environmental hazard. A sodium hydroxide (NaOH) solution is supplied to both the Venturi-type pre-quencher that saturates the exhaust gas with the solution and also cools it prior to entering the scrubber tower, and to the top of the scrubber tower media by one of two recirculation pumps. Selection of the recirculation pump to be used is made using a selector switch on the control panel. Each pump is also equipped with a disconnect switch and a hand/off/auto switch mounted next to the pump. If the selector switch is in the "off" position, the pump will not operate, even if it is the one selected at the control panel. In the "hand" position, the pump runs, even if it is not the one selected at the control panel. The preferred operational mode is to place both pumps in "auto" and control their operation from the control panel.

Caustic solution flow from the operating pump is directed through a discharge pipe that branches into lines that deliver the solution to the quencher and the scrubber tower. Manual valves on each of these lines are used to regulate the flow rates. Paddle-type flow meters are installed on these lines as well, and flow indicators mounted on the TOU control panel register current flow rates. The manual valves should be adjusted to direct a flow of 40 gpm to the quencher and 130 gpm to the scrubber tower.

Caustic solution flow is downward through the scrubber tower media, while exhaust gas enters at the bottom of the tower and is drawn upward through the media by the exhaust fan. As the reaction between the NaOH in solution and the HCL present in the exhaust gas proceeds, the solution may become saturated with the reaction product salts. These salts may precipitate out of solution, plugging pipes and meters and also reduce the HCL-removing capacity of the caustic

solution. To prevent these problems, a portion of the caustic solution is continuously drained off, referred to as "blowdown." The blowdown rate is read from a flowmeter mounted next to the scrubber, and is controlled by adjusting the manual valve located on the blowdown drain line. The current blowdown rate is 5 gpm, but if insoluble salts start to disrupt operation of the scrubber system, this rate may be increased by opening the regulating valve further.

As water is lost from the system through blowdown and evaporation, fresh make-up water is added to the system. Floats located in the scrubber tower sump operate a solenoid valve in the plant effluent pressure line that opens to allow fresh water to enter the sump when the low level float switch is activated. The flow rate for make-up water is regulated by adjusting a manual valve on the water inlet line. A flow meter is mounted next to the scrubber tower, and the current make-up rate is 15 gpm. If the blowdown rate is increased, the make-up rate should be increased also, to prevent the system from running low on water. Additional float switches are installed in the scrubber tower sump. The high-high sump level switch indicates the tank has overfilled. The most likely cause is the make-up line solenoid valve has either stuck open or the float switch that closes the valve did not operate correctly. Activation of this switch initiates an alarm and shuts down the TOU. The low-low sump level switch indicates the tank level is unusually low. The most likely cause is the make-up line solenoid valve has either stuck closed or the float switch that opens the valve did not operate correctly. Activation of this switch initiates an alarm and shuts down the TOU.

The NaOH in solution is depleted as it reacts with HCL in the exhaust gas. HCL continues to dissolve in the water solution and the solution pH level drops . A pH electrode is installed in the caustic solution recirculation line and a PLC on the control panel monitors and displays the pH on its screen. The pH set point on the PLC is 7.0 and will generally not require operator adjustment. If the pH drops below 7.0, the controller will signal the caustic chemical feed pump to start pumping NaOH into the tower sump in order to raise the pH level of the solution. In order to ensure the pH meter is measuring correctly, the pH electrode is periodically removed from the system pipe and immersed in a standard pH solution purchased from a laboratory supply company. The meter is calibrated by inputting the pH of the standards used into the PLC.

5.3.2.4 Thermal Oxidation System Start-Up

Start-up of the TOU is, for the most part, accomplished automatically by the system software program installed by the manufacturer. Prior to starting operation, however, the operator must verify the following conditions:

- All disconnects on the Motor Control Center (MCC) panel are closed,
- Combustion blower disconnects are closed,
- Purge air fan disconnect is closed,
- Main exhaust fan disconnect is closed,
- Scrubber recycle pump disconnects are closed,
- Sump pump disconnect is closed,
- Diversion valve drive motor disconnect is closed,
- Control room exhaust fan disconnect is closed,
- Each recycle pump selector switch is in "auto" position,
- TOU control panel power switch is "on",
- TOU control panel valve switch is "on",
- TOU control panel sequence start switch is in "standby",
- Scrubber system enable switch is "on",
- Caustic feed pump switch is "on",
- Either recycle pump #1 or #2 is selected,
- VFD mode selector switch is in "auto" position,
- Water supply valve to scrubber is open,
- Recycle tank drain line is closed,
- Inlet and outlet valves on recycle pumps are fully open,
- Valve on exhaust fan drain line is open,
- Manual gas valves to both burners are open,
- Combustion air blowers are running,
- Anti-backdraft dampers between combustion air blowers and burners move freely,
- The selected recycle pump is running,
- The recycle tank level is between 25 and 40 inches.

Any system conditions that are inconsistent with programmed operational ranges will be indicated by sounding an alarm. The message display on the control panel will register the condition(s) preventing system start-up. For example, the recycle tank level may not be high enough, or the recycle flow rate may not be high enough. After correction of these conditions, system start-up is initiated by depressing the "auto sequence start" button on the control panel. Fresh air flow through the RTO from the purge fan will continue for three minutes before the burners ignite. When the combustion chamber reaches operating temperature as indicated by digital readouts on the PLCs, the System Status switch is rotated to the "run" position, the isolation dampers open and the bypass dampers close to allow air to be drawn from the DAS basins.

Shutdown of the TOU system is accomplished by first rotating the system Status switch from "run" to "standby." The isolation dampers will close and the bypass dampers open. Fresh air should be allowed to purge the system for at least thirty minutes and the combustion chamber temperature allowed to drop to below 200° F before the TOU is shut down by depressing the "auto-stop" button on the control panel.

5.3.3 Powdered Activated Carbon Treatment (PACT) Process.

Wastewater flow from DAS-101 enters PCT-201 through valve V-201A and flow from DAS-102 enters PCT-202 through valve V-202A. Water flow through the entire PACT system is by gravity, first through first stage aeration, followed by first stage clarification, second stage aeration and second stage clarification.

The domed PACT structures are designated exclusion zones, and only personnel with hazardous material training are permitted to enter. Due to the potential presence of volatile contaminants inside this structure, air quality monitoring is required during entry and an air purifying respirator (APR) equipped with cartridges that filter out organic contaminants must be worn. Since physical contact with contaminated groundwater is possible, protective clothing, including a water-proof Tyvek suit, gloves and boots must be worn when entering this exclusion zone. Refer to the SSHP for specific safety instructions concerning working in exclusion zones.

5.3.3.1 First Stage Aeration and Clarification

Wastewater flow from the DAS basins first enters the first stage aeration process of the PACT system. An aerobic bacteria population maintained in the aeration tank consumes organic contaminants present in the groundwater as food. Stable system operation is achieved by controlling the food to microorganisms (F/M) ratio, providing an adequate oxygen supply for the aerobic bacteria, and adding an essential nutrient, phosphorus. The system components used to control this process are described in the following subsections.

5.3.3.1.1 Return Sludge Pumps

The microorganism population present in the first stage aeration tank is estimated by determining the volatile suspended solids concentration in the mixed liquor. Factoring in the tank volume allows the pounds of biomass in the aeration tank to be calculated. The supply of food that enters the aeration tank is estimated by determining the chemical oxygen demand (COD) concentration of the wastewater entering the tank. Factoring in the daily flow rate allows the pounds of food added to the tank each day to be calculated. A healthy activated sludge system is achieved by maintaining a food to microorganism (F/M) ratio, in pounds of COD added daily to pounds of biomass under aeration, of 0.1 to 0.2. In short, roughly five to ten times as much biomass should be present in the aeration tank than food added each day.

Since contaminated water flow through the aeration tank is continuous, the food supply is not controllable by the operator. The proper F/M ratio is, therefore, maintained by controlling the biomass concentration. Flow out of the aeration tank contains many of the organisms needed for contaminant removal, so a clarifier is provided where these organisms settle out and are then pumped back to the aeration tank. Sludge from the first stage clarifier is continuously pumped back to first stage aeration using return sludge pumps RSP-220, 221 and 222. Over time, the microorganism population will increase excessively and the F/M ratio will drop unless some of the biomass is removed from the process.

During normal operation, RSP-221 draws sludge from the bottom of the PCT-201 first stage clarifier through valve V-221A and discharges through valve V-221B to the first stage aeration tank. RSP-222 draws sludge from the bottom of the PCT-202 first stage clarifier through valve V-222A and discharges through valve V-222B to the first stage aeration tank. Operational adjustment of these valves is performed manually. RSP-220 is a standby pump provided to replace either RSP-221 or RSP-222 as necessary. To operate in place of RSP-221, RSP-220 draws sludge from the bottom of the PCT-201 first stage clarifier through valve V-220B and discharges through valve V-220E to the first stage aeration tank. To operate in place of RSP-222, RSP-220 draws sludge from the bottom of the PCT-202 first stage clarifier through Valve V-220A and discharges through valve V-220D to the first stage aeration tank.

Variable frequency drive (VFD) units have been installed on each RSP to regulate pumping rates by controlling the drive motor speed. A hand/off/auto switch is provided to select the desired operational mode. In "hand" mode, the pump is started by depressing the "start" button on the control panel and is shut off by depressing the "stop" button. Motor speed is adjusted by turning a dial calibrated in % motor speed. Magnetic flow meters installed in the pump discharge line signal PLCs mounted on the wall opposite the main control panel where the flow rates may be observed. Though the desired flow rate may be obtained initially in hand mode, the motor speed remains constant unless operator adjustment of the dial is performed. If product viscosity changes, or partial plugging of the system pump and piping occurs, the pumping rate may change or even cease altogether.

The preferable automatic operational mode, selected by moving the switch to "auto," allows the operator to input the desired flow rate, and the PLC regulates motor speed to maintain that rate. On and off functions are performed at the DCS work station when the system is operated in automatic. Along with the start/stop icons, the Return Sludge Pumps screen (D3A) on the DCS monitor also registers pump hours run, totalized flow through each meter (in 100,000 gallon increments) and current pumping rate in gpm. After starting the RSP using the DCS, pump rate is controlled by the PLC. Each PLC also has a hand and auto control mode, which are selected by depressing push buttons on the controller. Return sludge flows have typically been maintained at 200 gpm for this system. To program the PLC to regulate this flow rate, the

processor is first put into "hand" by pushing the labeled button on the face of the PLC. The % speed function is selected using the horizontal arrow keys. The % motor speed is adjusted using the up and down arrow keys until the desired pumping rate in gpm is achieved. The "auto" selector button is then depressed and the controller maintains the pumping rate set point automatically by regulating pump motor speed. Additional functions may be programmed into the PLC, such as how quickly the controller responds to changes in the flow rate, but these do not typically require operator adjustment.

The amount of biomass that must be removed from the system is determined by comparing the microorganisms mass actually present in the aeration basin (using mixed liquor volatile suspended solids (MLVSS) concentration and tank volume) to the calculated mass required to maintain the desired F/M ratio. For example, consider the following operating parameters, which are consistent with current conditions:

Influent daily flow	0.8 MGD	Aeration Tank MLVSS	2640 mg/l
Influent COD	150 mg/l	LBS of biomass	11,000 lbs
LBS COD/day	1000 lbs	F/M Ratio	.09

To balance the system at an F/M ratio of 0.1, one thousand pounds of biomass should be removed.

The in-house laboratory performs frequent analyses of the return sludge that settles in the first stage clarifier and is continuously returned to first stage aeration. Let's assume for this example that the volatile solids concentration in this settled sludge is 3%. At this concentration, each gallon of sludge contains 0.25 pounds of biomass. To waste the required 1000 lbs, 4000 gallons should be removed from the process.

Waste sludge from the first stage clarifier is pumped to the aerobic digester in the multi-purpose tank. System design allows automatic control over this function using motor operated valves (MOVs) on the RSP discharge lines. Normally, return sludge from the PCT-201 first stage clarifier passes through MOV-221F back to the first stage aeration tank. PCT-202 return flow is

through MOV-222F. During wasting, these valves are closed and MOV-221G and MOV-222G are opened to direct flow to the aerobic digesters. The MOVs may be operated locally by positioning a switch located on each MOV to either the "open" or "closed" position. However, sludge wasting is simplified by putting the switches in the "remote" position and using the DCS to control the process. The PACT systems screen (D2) on the DCS monitor displays the MOVs on the RSP discharge lines. Open valves are illuminated in green while closed valves are illuminated in red. During normal operation, MOVs 221F and 222F are open and illuminated in green, while MOVs 221G and 222G are closed and illuminated in red. Two input boxes for each PCT are provided and are accessible by clicking on them using the mouse. The top box allows input for the time of day sludge wasting is to commence. The lower box accepts input for the duration of the wasting event. For instance, let's say we want the daily wasting period to begin at 8:30 am, so 8:30 is entered in the top box. At that time, the DCS controller will signal MOV-221F (or- 222F) to close and MOV-221G (or 222G) to open.. Using the wasting volume of 4000 gallons from the previous example, and knowing the RSP pumping rate has been set at 200 gpm, duration time in the lower box is set for 20 minutes. After the specified duration, the MOVs automatically return to their original positions. The input parameters remain effective day after day. If laboratory results indicate the wasting volume requires changing, this is easily accomplished by adjusting the waste time duration.

5.3.3.1.2 Phosphoric Acid Feed System

Phosphorus is an essential nutrient for microorganisms maintained in the first stage aeration tanks, and is often not present in extracted groundwater in sufficient quantity to meet biomass requirements. A phosphoric acid feed system has been installed to inject phosphoric acid into the first stage aeration tank influent lines to both PCT systems. Phosphoric acid is highly corrosive and a severe health risk, so appropriate safety measures must be taken when working around the acid storage tank, pumps and plumbing. Personal protective equipment required includes safety glasses, splash shield, rubber gloves and rubber boots. Refer to the SSHP for specific instructions concerning protective equipment. The phosphoric acid storage tank and pumps, located in the GTB, are enclosed within a concrete retaining wall to contain leaks.

Three chemical metering pumps (PAP-630, 631 and 632) are provided to deliver phosphoric acid to the PCTs. PAP-631 is usually used to pump to PCT-201 and PAP-632 pumps to PCT-202, but manual valves on the system's discharge lines allow PAP-630 to be used in place of either of the others. Control panels for each pump are mounted just outside the containment wall and include an electrical disconnect and an on/off switch, but operation of any of these chemical feed pumps is possible only from the Phosphoric Acid Feed screen (E3) at the DCS work station.

The Phosphoric Acid feed screen on the DCS monitor illustrates the acid storage tank (PAT-635), the three metering pumps and associated system controls and alarms. A pressure gauge mounted on the bottom of the storage tank is used to estimate product volume and actuates alarms when the tank level is low (LAL-635) and acid must be ordered, and when the tank level is high (LAH-635). LAH-635 may go off during product delivery and warns that tank filling must be ceased to prevent overflow.

An additional alarm (LSH-636) is actuated by a float switch installed in the containment area sump and indicates product has leaked from the tank or piping. Phosphoric acid spills may be neutralized with bicarbonate of soda, diluted with large quantities of water and disposed of through plant processes by transferring it to the GTB sump which pumps to the DAS splitter box. Any of these alarm conditions will be indicated on the DCS monitor by a flashing red illumination of an alarm icon. The acid level in the tank is graphically represented by shading in the tank illustration and the volume in gallons, determined by a pressure gauge installed on the bottom of the tank, is registered on this screen as well.

Icons above the pump illustrations allow the pump mode, either "auto" or "manual", to be selected by clicking with the mouse. When run in manual, the feed pump is started by clicking "start" and stopped by clicking "stop".

The chemical feed pumps deliver product using a diaphragm that moves horizontally back and forth, either drawing acid into a compression chamber or pushing it out. Check balls installed above and below the diaphragm control the direction of flow. Manual adjustment of the diaphragm stroke length allows the rate of flow to be controlled. Even at the lowest feed rate

available, phosphoric acid delivery may exceed the nutrient requirements of the PACT process. Automatic control performed at the DCS work station allows intermittent feed of phosphoric acid to achieve the desired dose. Start and stop times are input using the DCS keyboard and the pump will run each day for the duration selected.

According to the Zimpro PACT System Operation Manual, located in the Operator's Office, the correct dose of phosphoric acid is being supplied when the total P concentration in the first stage clarifier effluent is 1.0 mg/L. Phosphorus analysis of this effluent is performed daily in the on-site laboratory, and phosphoric acid feed may be regulated by adjusting the feed duration time, based on these results.

A graduated cylinder incremented in .01 gallon divisions has been installed on the inlet line of each chemical metering pump. Phosphoric acid may be introduced into the cylinder from the tank by opening the valve on the bottom of the cylinder. If the valve from the tank is closed, the pumps will then draw acid from the cylinder and the pumping rate can be determined by observing the volume of acid pumped during a certain period of time. The chemical feed dose can then be calculated. For example, let's assume the feed rate was observed to be .01 gpm. The metering pump controls have been set on the DCS to run for three hours each day, making the volume pumped each day 1.8 gals. Based on the following criteria,

Phosphoric Acid Concentration	70%
Phosphoric Acid Weight	11.5 lbs/gal
Phosphoric Acid Feed Rate	1.8 gpd
Phosphoric Acid Daily Feed	14.5 lbs
Groundwater Flow	0.8 MGD

the phosphoric acid concentration introduced to the aeration tank is 2.2 mg/l. If 1.0 mg/L remains in the clarifier effluent, the microorganisms have utilized 1.2 mg/L or about eight pounds of the phosphoric acid added.

5.3.3.2 Second Stage Aeration and Clarification

Wastewater from the first stage clarifier enters the second stage aeration tank by gravity flow. An aerobic bacteria population maintained in the aeration tank consumes organic contaminants present in the groundwater as food. In addition, powdered activated carbon (PAC) is added to this aeration tank to adsorb organic substances the microorganisms cannot utilize and toxins detrimental to the biological system. Stable system operation is achieved by controlling the F/M ratio, providing an adequate oxygen supply for the aerobic bacteria, and feeding the appropriate amount of PAC to remove toxic contaminants. The system components used to control this process are described in the following subsections.

5.3.3.2.1 Return Sludge Pumps

Similar to first stage aeration, control of second stage aeration tank processes involves monitoring COD and biomass concentrations. Since many contaminants have been removed in the first stage, the food supply and thus the microorganism mass maintained in this process is much lower. One difference from first stage aeration is that powdered activated carbon (PAC) is added. Refer to the Zimpro PACT System Operation Manual, located in the Operator's Office, and Section 2.3 of this manual for a discussion of how PAC works in this process. Since the PAC added is volatile under the conditions of solids analyses, mixed liquor volatile suspended solids (MLVSS) is not an accurate estimate of the biomass in the aeration tank. Certain modifications to the analytical procedures used for determining MLVSS allows differentiation of the volatile solids that are biomass and those that are carbon.

Process control of the sludge recirculation components of the system are the same as for first stage, except the identifying labels for pumps and valves use the 300 series rather than 200. Functions are performed from the DCS work station using the Return Sludge Pumps screen (D3B). PLC adjustment of pumping rates is identical to first stage, described in section 5.3.3.1.1. Since the settled solids in the second stage clarifier, which are typically returned to second stage aeration, contain significant levels of PAC that may still be beneficial for toxic contaminant removal, these solids are "wasted" to first stage aeration rather than to the aerobic

digester. Though the wasting rate may differ from first stage aeration, operational control over the MOVs is identical to first stage.

5.3.3.2.2. Powdered Activated Carbon (PAC) Feed System

The powdered activated carbon (PAC) silo is equipped with a chemical handling and delivery system consisting of bulk storage, a dry material paddle feeder, metered dilution water and a wetting chamber. Bulk storage is provided in the upper portion of the silo and includes the piping necessary to transfer PAC from a delivery truck, a dust collection station with filter bags, an air purge system, level sensors (low, intermediate and high), a bin vibrator and the system control panel containing an electrical disconnect, level indicating lamps and switches for the exhaust fan and pulsed compressed air bag cleaning process.

PAC is transferred from a bulk trailer through a flexible hose connected to the storage tank inlet pipe. The bulk trailer is pressurized with compressed air from either the facility air compressors or a compressor mounted on the trailer. The exhaust fan located on top of the silo is operated during PAC transfer to produce a vacuum in the storage tank and facilitate the transfer. Exhaust from the fan is directed through cloth bags that capture PAC dust, preventing its release to the atmosphere. Accumulated dust on the bags' exterior surface is periodically removed by a reverse jet of compressed air and drops back down into the storage silo. The pulsed cleaning action proceeds row by row across the dust collector, while the flow of dusty air into the filter area continues uninterrupted.

Three level sensors are installed through the side of the storage silo at levels corresponding to "silo full" (high-high), "re-order" (high) and "silo low" (low). The silo tank capacity is about 3500 cubic feet and the high-high sensor is activated at nearly this volume. If the high-high alarm is activated during carbon transfer, delivery of PAC from the bulk trailer should be halted to prevent over-filling the storage tank. At the high sensor level, 1500 cubic feet of PAC remains in the tank, and at the low sensor level, 500 cubic feet. These paddle-wheel clutch-type sensors detect the presence of material by the stoppage of their rotating paddle wheels. When the rotation of the wheels are stopped, a spring/clutch combination removes power from its drive

motor and activates a switch. The high-high level sensor normally clears the top of the stored PAC, so its alarm condition is activated when the rotating paddle is stopped. The high and low level sensors are normally in the stored PAC, so their alarms are activated when carbon level drops and the paddle starts to rotate. Power is supplied to the high-high level alarm only while the tank is being filled, while the high and low alarms are always powered. When any of these alarms are activated, a carbon feed system general alarm is indicated on the DCS computer.

A manual gate valve is installed at the bottom of the coned section making up the bottom of the PAC storage tank. The valve may be closed to contain product when the carbon slurry make-up equipment is being worked on, but must be open when the system is in operation. Below this valve is a rotary paddle dry chemical feeder driven by a variable speed direct current (DC) motor. Motor speed is controlled using a dial gauge calibrated in % speed mounted on the system control panel located inside the GTB. The feeder capacity (at the 100% speed setting) is 180 pounds per hour based on a PAC density of 12 pounds per cubic foot.

The dry chemical feeder delivers PAC into a conical wetting chamber. Water flow through piping at the bottom of the cone pulls the wetted carbon by induction into a holding/mixing tank located inside the GTB. Make-up water for this system is supplied by the facility effluent pressure line. An additional booster pump is installed in the water feed line to ensure adequate water pressure and volume is available through the induction line. Water flow rate is controlled by manually adjusting valves in the supply line to both the wetting chamber and the inductor. A rotometer, calibrated in the gpm, is installed in the water supply line to meter flow rate through the induction line. The maximum flow rate indicated by this meter is 30 gpm.

The contents of the holding/mixing tank are continuously agitated with a mixing impeller to prevent PAC from settling out. Electrodes installed in the holding tank control the slurry make-up system when the operational controls are in the automatic mode. A low level electrode signals the slurry make-up system to start and a high level electrode turns the system off when the storage tank is sufficiently full. An additional electrode is provided above the high level electrode that activates an alarm warning the tank is about to overflow. A fourth electrode below the low level electrode activates an alarm indicating the tank is nearly empty. These alarms

illuminate the appropriate indicating lamps on the system control panel, sound an audible alarm, light a red beacon mounted near the PAC system control panel, and communicate the alarm condition to the DCS computer.

The truck unloading control panel located outside on the carbon silo houses controls for the dust collector, silo exhaust blower and bin vibrator. A hand/off/auto switch is provided to operate the silo exhaust blower which runs continuously when the switch is in "hand". In "auto" mode, the blower operates when an auxiliary switch is activated by connecting the delivery hose to the tank inlet pipe. When loading the silo from a bulk trailer, the blower selector switch should be in "auto." Prior to connecting the delivery hose, the auxiliary switch should be manually actuated and one hand placed over the inlet to ensure a high level of suction is present. If no suction is present, the dust collector blower may not be running and should be checked before proceeding with carbon transfer. If only a low level of suction is present, the dust collector bags may be plugged or caked with carbon dust. The bags should be cleared either manually or by using the air purge system prior to filling the storage tank.

The system operation control panel located inside the GTB houses the following switches:

- Hand/Off/Auto for carbon silo power vents
- On/Off for holding tank mixer
- Hand/Off/Auto for dilution water solenoid valve
- Hand/Off/Auto for the bin vibrator
- Hand/Off/Auto for the dry chemical feeder
- Dial potentiometer to regulate dry feeder speed

Typically, the holding tank mixer remains on constantly to prevent PAC from settling out. All other switches are set to "auto" so the make-up system operates off the holding tank electrodes. The dry feeder speed is currently set at 50% speed to feed PAC into the wetting chamber at a rate of about 90 pounds per hour.

Red indicator lamps are provided on the control panel for the following parameters and are illuminated under the listed conditions:

- Power: On
- Power Vents: Running
- Mixer: On
- Water Solenoid Valve: Open
- Bin Vibrator: Running
- Dry Chemical Feeder: Running
- Holding Tank Alarm: High Level
- Holding Tank Alarm: Low Level

Control switches are normally operated in the automatic mode, but may temporarily be run in "hand" to check out proper operation. Operating in hand mode may result in overfilling the wetting chamber with dry PAC or overfilling the slurry holding tank with water if the operator is not carefully observing the process.

PAC slurry delivery from the holding tank to the second stage aeration tanks is accomplished using one or both of the Wilden air-diaphragm carbon feed pumps (CFPs) provided. Typically, CFP-670 is used to pump to PCT-201 and CFP-671 pumps to PCT-202, but manually operated crossover valves on the discharge lines allow either pump to be used to pump to either PCT.

Table 5.4 summarizes valve positioning for PAC slurry delivery to the PCTs using the two pumps provided. "xxx" indicates the valve position does not affect the desired operation.

The compressed air lines connected to the Wilden pumps are equipped with an air filter, pressure regulator and oil lubricator system that protect internal components of the pump from particulates and reduce operating friction, minimizing the required shifting force and reducing wear. Each pump has two teflon diaphragms located opposite each other, so that when compressed air is pushing on the backside of one diaphragm during its discharge stroke, the other

is pulled in on its suction stroke. This alternating sequence is repeated at a rate dependent on the volume of compressed air provided through the manually adjusted air regulator.

Table 5.4

Valve Positions for PAC Delivery

	V-670	V-671	V-676	V-679	V-680	V-681	V-682
CFP-670 to PCT-201	open	xxx	Open	xxx	closed	open	xxx
CFP-671 to PCT-202	xxx	open	Xxx	open	closed	xxx	open
CFP-670 to PCT-202	open	xxx	Open	xxx	open	closed	open
CFP-671 to PCT-201	xxx	open	Xxx	open	open	open	closed

Even at the lowest adjusted air feed rate to the supplied pumps, which deliver carbon slurry to the PCTs through 3-inch diameter piping, the feed rate exceeds the make-up rate of the system. The result is frequent low level alarms in the slurry holding tank. To prevent these conditions, the manual valves on the pump discharge lines have been throttled down to produce a head pressure that reduces the pumping capacity.

A flush water line is connected to the Wilden slurry pump discharge lines. When the PAC delivery period ends, solenoid valves supplying compressed air to the pumps close and solenoid valves supplying pressurized facility effluent water to the feed lines leading to the aeration tanks open. A few minutes of flushing prevents PAC that remains in the feed lines from settling out and eventually plugging the pipes.

Hand/Off/Auto switches to control both the compressed air and flush water solenoid valves are mounted on a frame next to the pumping system. In "hand," the valves are open and in "off," the valves are closed. When set in "auto," the preferred operational mode, operation of the PAC

slurry pumping system is controlled from the DCS screen E7. This screen includes graphic representations of the two feed pumps, system control valves, flush water connections and the piping carrying product to the two PCT tanks. The PAC feed pumps do not need to run continuously to deliver the carbon requirement to the aeration tanks. Pump operation is regulated by inputting the start time and the interval duration time (in minutes) using the DCS mouse and keyboard. For example, CFP-670 may be set to commence pumping to PCT-201 at 7:00 for a duration of 240 minutes, and CFP-671 set to pump for 240 minutes to PCT-202 beginning at 12:00. When the flush water control switch is in "auto," the supply solenoid valve will open at the end of the PAC feed period. The flush duration time is also input on screen E7 and adequate discharge line flushing is achieved by setting this parameter to 120 seconds.

By design, the manual valving should be set, the PAC slurry delivery time adjusted as necessary to deliver the desired amount of carbon, and the system allowed to operate day after day in the automatic mode. However, during practice, it has been found that after the delivery period is over, product in the elevated discharge line frequently leaks backwards through the ball check valves in the diaphragm pumps, flows into the slurry tank and activates the holding tank high level alarm. To prevent this alarm condition, the manually actuated valves on the pump inlet lines are closed every day after the delivery period has ended and opened each day prior to the delivery period start time. The pumps are left off, with the valves closed, over weekends or during holidays when the facility is not staffed and no operators are present to actuate the valves.

A second carbon slurry feed system consisting of two rotary dip feeders, (CFP-660 and 661) is provided that delivers PAC to the first stage aeration tanks through 1-inch diameter piping. Each feeder is a packaged system that includes a control panel with an electrical disconnect, a power On/Off switch and indicating lamp, a mixer On/Off switch and indicating lamp, feeder "start" and "stop" buttons and indicating lamp, a feeder control auto/manual switch, a manual speed control dial calibrated in % speed and a speed indicating meter, and a feeder failure indicating lamp with a reset button.

The rotary dip feeder, manufactured by Chemical Metering Systems, Inc., consists of a stainless steel tank divided into two chambers. Carbon slurry from the holding/mixing tank flows into one

chamber by gravity through a float valve that opens when the chamber level is low and closes when the chamber is full. A mechanical mixer agitates the slurry to prevent PAC from settling out. A rotating wheel with eight one-ounce capacity cups attached to it dips into the slurry, filling the cups which then empty into the second chamber. Water supplied by the effluent pressure pump flows through the PAC delivery pipe that runs beneath this chamber, drawing in carbon slurry by induction and carrying it to the first stage aeration tank. The wheel is chain driven by a ¼ hp variable speed DC motor. Motor speed, and thus chemical feed rate, is adjusted using the potentiometric dial controller on the control panel.

Frequent analyses of the second stage clarifier effluent for organic compounds will show if the proper powdered activated carbon dosage is being added. Detection of trace concentrations (1-5 parts per billion) of common organic contaminants like 1,2-dichloroethane are typical in this sample and are removed in subsequent treatment processes. Concentrations greater than 10 ppb or the detection of several different contaminants in the clarifier effluent indicate the need to increase PAC feed. If these organic contaminants are consistently never detected in secondary clarifier effluent, it may mean that PAC feed is excessive. Excessive carbon feed wastes chemical, results in more solids for disposal and can cause an increase in suspended solids in the clarifier effluent.

Powdered activated carbon feed is controlled by adjusting the pumping duration interval time on screen E7 on the DCS. Though the delivery pump runs continuously during the selected interval, the PAC slurry make-up system operation is intermittent as the holding tank level alternates between high and low levels based on the electrode elevations. To allow the actual weight of product delivered during a feed interval to be determined, a meter calibrated in tenths of an hour is provided on screen E6. This meter totalizes the time the slurry make-up system runs, and, more importantly, the time the dry chemical paddle feeder delivers PAC at a known rate. For example, if the timer indicates the paddle feeder, delivering carbon at 90 pounds per hour, ran for 15 tenths of an hour during a 4-hour pumping cycle, 135 pounds of PAC was pumped to the second stage aeration tank. Next to the meter on screen E6 is a graphic illustration of the carbon feed system which is illuminated in red when the slurry make-up system is operating.

Since the organic contaminant concentration entering first stage aeration is currently significantly lower that the facility design capacity and some PAC is introduced to this aeration tank each day from the second stage clarifier during the sludge wasting cycle, the paddle feeder system is not used. If influent characteristics change, and toxic contaminants are introduced that have an observable detrimental affect on the microorganism population in the first stage aeration basin, this feed system may be operated to provide supplemental PAC to this tank..

5.3.3.2.2 Polymer Feed System

The mixed liquor that flows by gravity from the second stage aeration tank to the second stage clarifier contains a high concentration of powdered activated carbon. These PAC particles are often very tiny and very light, so they settle poorly and may be carried out of the tank in the clarifier effluent. To maximize clarifier efficiency, coagulant aids may be added. In this case, a cationic polymer is fed to the second stage aeration tank effluent that causes the tiny particles to clump together, forming a floc of larger particles that settles more readily in the clarifer.

Three chemical feed pumps are provided that discharge a polymer emulsion from a 55 gallon drum into a flash mixer that dilutes the emulsion in potable water. Flow from the potable water line then carries the solution to the second stage aeration tank effluent line. PMP-621 is usually used to pump to PCT-201 and PMP-622 pumps to PCT-202, but manual valves on the discharge lines allow PMP-620 to be used in place of either of the others. Control panels for each pump are mounted on the flash mixing tanks and include an electrical disconnect and a hand/off/auto switch for the water supply valve and mixer. Additional controllers allow automatic or manual control of the chemical metering pump. The pump stroke rate may be adjusted in either strokes/minutes or in strokes/hour and a digital readout shows the rate selected. The % stroke output of the diaphragm metering pump is adjusted with a dial controller on the face of the pump itself.

The Polymer Feed screen (F3) on the DCS monitor illustrates the three metering pumps and allows selection of "auto" or "manual" control, and the input of start and stop times if it is desired to operate the system intermittently. Since there is a continuous flow of treated

groundwater through the clarifier, polymer feed should be continuous as well. This may be accomplished by either operating the feed system in "manual" mode, or operating in "automatic", setting the start and stop times to the same time and starting the pump.

A graduated cylinder incremented in milliliters has been installed on the inlet line of each chemical metering pump. Polymer may be poured into the top of the cylinder so if the valve from the storage drum is closed and the valve at the bottom of the cylinder opened, the pumping rate can be determined by observing the volume of polymer pumped during a certain period of time. For example, let's say that chemical tests performed in the laboratory have shown that the optimum dose of the polymer emulsion in the mixed liquor (that is, the dose that provides the best observable flocculation and clarification in a jar test) is 2 mg/L. Based on the following criteria:

Desired Polymer Feed Rate	2.0 mg/L
Polymer Weight	8.4 lbs/gal
Groundwater Flow	0.8 MGD

About 13.4 lbs or 1.6 gallons per day of polymer should be fed. This is equivalent to 6,000 ml per day and results in a desired feed rate of 4.2 ml/min. If the minimum adjusted discharge volume of a single pump stroke is determined to be 0.5 mL, the stroke rate for the feed system may be adjusted to 8.4 strokes per minute to achieve the desired feed rate.

5.3.3.3 Activated Sludge Blowers

The activated sludge blowers (ASB-220, 221, 222) are located in the blower building and provide compressed air to the diffusers in the bottom of the first and second stage aeration basins and the aerobic digester of the PACT system. Operation of these blowers is identical to the diffused air stripper blowers described in section 5.3.1.2.

During normal operation, ASB-221 draws outside air through filters mounted on the roof of the blower building and discharges through valve V-226 into PCT-201, while ASB-222 discharges through valve V-223 into PCT-202. A third blower (ASB-220) is provided that delivers air to PCT-201 through valve V-224 or to PCT-202 through valve V-225. The discharge valves are manually actuated gear-driven, hand-wheel butterfly valves with chains looped over the wheel that extend to the floor. The chain allows valves located overhead to be adjusted from ground level.

Instructions for operating the controllers that regulate system pressure and thus discharge air flow rates to the PCTs are also provided in section 5.3.1.2. Once the discharge duct enters each domed PCT structure, it branches off into individual supply lines to the first stage aeration tank, the second stage aeration tank, and the aerobic digester. Each of these lines split off into separate lines through a manifold system, delivering the compressed air to a set of three diffuser racks. Manually adjusted disk valves are installed on the pipes leading to each set of diffusers that allows the compressed air feed to be distributed evenly across the entire tank. The valves allow air flow to the aerobic digester to be shut off completely during those periods when solids are allowed to settle out so the clear upper layer can be decanted off from the digester back through plant treatment processes and settled sludge may be pumped out for dewatering and disposal.

Two factors determine the proper compressed air feed rate to the aeration tanks. One is visual confirmation that adequate mixing is being provided to both keep solids in the mixed liquor in suspension and to maximize physical contact between microorganisms and their food contained in the contaminated groundwater entering the tanks. The second parameter requires an analysis

of the dissolved oxygen (DO) concentration of the mixed liquor. Microorganisms deplete oxygen as they consume organic contaminants and a minimum dissolved oxygen concentration of 2-5 mg/L is essential to maintaining a healthy biomass.

Under current conditions at the facility, oxygen demand in the aeration tanks is relatively low and an air flow rate from the ASBs of 1500-2000 cfm to each PCT provides adequate mixing and DO concentrations exceeding 5 mg/L. In fact, it has been possible to operate a single ASB and provide the necessary compressed air to the two PCTs using the system discharge valves to direct flow evenly to both systems. If contaminant concentrations entering the facility increase and the microorganisms' oxygen requirements go up, more compressed air will need to be provided to the diffusers in the aeration tanks.

5.3.4 Tertiary Filter System

Effluent from the second stage clarifiers flows by gravity into the tertiary filter storage tank (NFT-401), a 4000 gallon capacity closed vessel located inside the GTB. Two tertiary feed pumps (TP-510, 511) are provided that pump water from this tank through the three Hydrasand filters also located in the GTB. Each unit contains an 80-inch high bed of silica sand that filters out particulates from the water as it flows from the bottom of the vessel to the open top. There the water overflows a stainless steel weir and drains into another 4000 gallon closed vessel, the effluent storage tank.

Sand in the filter vessels is packed together closely enough that, though water can flow through the small spaces between the grains of sand, solid particles become trapped. As solids accumulate on the surface of the sand, even water flow becomes restricted, so a system is provided that continuously removes dirty sand, cleans it and returns clean sand to the filter bed. This backwash system includes two air lift lines connected to the bottom of each vessel where dirty sand can enter, then be transported to a sand wash chamber at the top of the tank. A portion of the filtered water rinses particulate matter from the sand as it rises through the sand wash chamber and then is directed to a drain that goes to the GTB sump. From the sump, the dirty rinse water is pumped to the DAS splitter box for treatment through facility processes.

Compressed air for the sand lift mechanisms is supplied by two Ingersoll-Rand two-stage high pressure duplex systems. Each system consists of a lead and lag air compressor with adjustable on/off pressure regulators mounted on top of a 240 gallon receiver tank. These duplex compressor units (AC-901 and AC-902) also provide the compressed air needed for the PAC dust collection system air purge, granular activated carbon transfer, and at various outlets in the GTB where compressed air may be used for cleaning equipment, inflating tires, etc. Piping from these units has also been extended to the blower building to provide compressed air if the air compressor there fails.

Compressed air is supplied to the air lift controls located on top of the filter tanks through copper tubing. These controls include a shut-off ball valve, a filter to remove particulates and moisture from the compressed air, a pressure regulator, and two rotometers with adjusting knobs to regulate the air flow rate to the two sand lift lines. Flexible hoses carry compressed air from the top of the filter to the bottom where they attach to the bottom of the sand lift lines. The location of the controllers at the top of the filters allows the effects of adjusting air pressure and flow to be observed as dirty sand is brought to the top for cleaning.

Typically, air pressure is adjusted to 25 psi and air flow rate to 2 cfm. If it appears sand cleaning efficiency is not adequate at this flow rate, air flow may be increased to as high as 4 cfm to increase how much sand is brought up to the sand wash chamber. In addition, the adjustable weir plate on the wash water discharge line may be lowered to increase the volume of water used to carry dirt from the sand. If the air pressure required to maintain the desired flow rate increases beyond 25 psi, it may indicate the screen installed in the air injection port at the bottom of the filter is plugged. This may be removed for cleaning by turning off the air supply, closing the manual gate valve on the bottom of the filter and unbolting the fasteners holding the screen. Water flow through the filter may continue while this is being done.

A small control box containing an electrical disconnect and a hand/off/auto switch is mounted next to each tertiary feed pump. Manually operated inlet and outlet valves are provided for each pump, as well as a motor operated valve (MOV) on each discharge line. In the event automatic

control of the MOV is lost, it may be manually actuated by pulling up on the hand wheel provided and adjusting the valve position by turning the wheel. Normally, the tertiary filter pump switches are placed in "auto", and the system is controlled from the DCS work station on screen E1. This screen contains graphic representations of the tertiary filter storage tank (NFT-401), the two tertiary feed pumps (TP-510, 511), the MOVs in the discharge lines of these pumps (MOV-510C, 511C), and the three sand filters (TF-521, 522, 523). Start and stop control of the pumps is available by clicking on the appropriately labeled boxes. Readouts of storage tank volume in gallons, run time for the pumps in hours, MOV position in % open, and water flow through the tertiary filters in both gpm and totalized in 100,000 gallon increments are also available on this screen.

The tertiary filter storage tank volume is also represented by shading to illustrate how much of its capacity is occupied by water. High and low alarm levels may be input, but the levels entered during facility start-up do not usually need adjustment. The low alarm shuts off the tertiary pumps to prevent them from running dry, while the high level alarm automatically closes an air-actuated valve on the influent line to prevent the tank from over-flowing. When this valve closes, any extraction wells operating in automatic will shut off and will have to be restarted after the problem causing the alarm is determined and corrected.

Flow through the tertiary filters is automatically controlled by the DCS by opening and closing the MOVs in response to the water level in the storage tank. Screen E6 allows the tank level set point to be input, as well as other process parameters, such as how quickly the MOV is adjusted in response to a change in tank level. These parameters, all input during plant start-up, generally do not require changing. Automatic and manual control selection of the MOVs is possible from this screen also, but the automatic mode of operation, where the MOVs are adjusted according to tank level, is usually desired.

Since the facility's NPDES permit includes a discharge limit of 0.5 mg/L of phosphorus in the effluent, a phosphorus removing process has been installed as part of the tertiary filtration system. Usually present as soluble phosphates, which are difficult to remove from water, phosphorus is removed by adding iron salts that react with phosphate, forming insoluble solids

which are filtered out by the sand filters. The ferric chloride feed system provided is very similar to the phosphoric acid feed system described in section 5.3.3.2.1. Like phosphoric acid, ferric chloride is very corrosive and a health risk, and requires that appropriate safety measures be taken when working around the storage tank, pumps, and plumbing. Personal protective equipment required includes safety glasses, splash shield, rubber gloves and rubber boots. Refer to the SSHP for specific instructions concerning protective equipment. The ferric chloride storage tank and pumps are located in the GTB, enclosed within a concrete retaining wall to contain leaks.

Two Wallace and Tiernan Series 44 tandem diaphragm chemical metering pumps (FCP-600 and 601) are provided to deliver ferric chloride to the 8-inch diameter discharge line from the filter feed pumps, prior to entering the sand filter vessels. In addition to manual adjustment of the pump stroke length that controls the volume of ferric chloride delivered, this system includes electronic stroke control devices. These control devices automatically adjust stroke length in response to the current wastewater flow being pumped to the tertiary filters and enable a consistent concentration of ferric chloride to be maintained. Control panels for each pump are mounted just outside the containment wall and include an electrical disconnect and a hand/off/auto switch, but the desired automatic mode of operation is controlled from the Ferric Chloride Feed screen (E4) at the DCS work station.

The Ferric Chloride Feed screen on the DCS monitor illustrates the ferric chloride storage tank (FCT-602), the two metering pumps and associated system controls and alarms. A pressure gauge mounted on the bottom of the storage tank is used to estimate product volume and actuates alarms when the tank level is low (LAL-602) and ferric chloride must be ordered, and when the tank level is high (LAH-602). LAH-602 may go off during product delivery and warns that tank filling must be ceased to prevent overflow.

An additional alarm (LSH-603) is actuated by a float switch installed in the containment area sump and indicates product has leaked from the tank or piping. Ferric chloride is highly corrosive and should not be introduced into plant processes in slugs, so the preferred cleanup method is to containerize spills, using absorbants if necessary. Small spills may be diluted with

large quantities of water and disposed of through plant processes by transferring it to the GTB sump which pumps to the DAS splitter box. Any of these alarm conditions will be indicated on the DCS monitor by a flashing red illuminated alarm icon. The ferric chloride level in the tank is represented by shading in the tank illustration and volume in gallons is registered on this screen as well.

Wording above the pump illustrations indicate whether the pumps are in the automatic or manual mode. In either case, start and stop functions are controlled from the DCS by clicking on the appropriate button on the monitor. The chemical feed pumps deliver product using a diaphragm that moves horizontally back and forth, either drawing ferric chloride into a compression chamber or pushing it out. Check balls installed above and below the diaphragm control the direction of flow. Continuous chemical feed is required in this application since the available reaction time is only the time it takes the flowing water to reach the filters from the point of application. A static mixer consisting of fins inside the delivery piping immediately following the point of ferric chloride injection helps put the iron and phosphate in contact with each other and speed the reaction.

A graduated cylinder incremented in .01 gallon increments has been installed on the inlet line of the chemical metering pumps. Ferric chloride may be introduced into the cylinder from the tank by opening the valve on the bottom of the cylinder. If the valve from the tank is then closed, the pumps will draw ferric chloride from the cylinder and the pumping rate can be determined by observing the volume of ferric chloride pumped during a certain period of time. The chemical feed dose can then be calculated.

The phosphorus concentration in the wastewater pumped from the tertiary filter storage tank is determined daily by the on-site laboratory, and may normally be around 1 mg/L. The required ferric chloride feed rate is usually three to five times the phosphate concentration in order to achieve acceptable removal, so it is expected that a 5 mg/L ferric chloride concentration will provide the necessary treatment.

Based on the following criteria,

Ferric Chloride Solution Concentration	40%
Ferric Chloride Weight	8.5 lbs/gal
Desired Ferric Chloride Feed Concentration	5.0 mg/L
Groundwater Flow	0.8 MGD

the necessary ferric chloride pumping rate is 9.8 gallons per day, and the chemical metering pumps should be calibrated to pump about 0.4 gallons per hour. Under these conditions, the phosphorus concentration in the tertiary effluent is less than the 0.5 mg/L limit. However, in practice, it has been found that, due to the very fine powdered carbon particulates present in the filter influent, suspended solids removal is poor. The carbon particles pass through the sand media along with the water, and the effluent suspended solids concentration remains the same as the influent, about 20-50 mg/L. Ferric chloride acts as a coagulant aid when added to water containing PAC, causing the tiny particles to floc together and form larger particles that can be filtered by the sand media. But to accomplish this result, a higher ferric chloride dose is required. Applying about one gallon of ferric chloride per hour, which results in a feed concentration of 12 mg/L, helps reduce suspended solids in the filter effluent to less than 10 mg/L. At this elevated dosage, total phosphorus is reduced to less than 0.1 mg/L.

5.3.5 Granular Activated Carbon System

5.3.5.1 GAC System Operation

Effluent from the tertiary sand filter system generally meets NPDES permit discharge limits for most parameters. Controlling the microorganism population and PAC feed to the PACT system, and properly regulating the chemical feed systems removes COD, BOD, ammonia nitrogen, phosphorus, suspended solids, amenable cyanide, metals and organic pollutant concentrations to the required levels. However, a number of contaminants listed in the NPDES permit have not yet been evaluated for toxicity and currently must not be detected in the facility's effluent at any concentration. Two compounds in particular, tetramethylurea and 1,1-dichloroethane, have been

detected in the past. In addition, low levels of other contaminants may, at times, pass through the GWTS components, resulting in noncompliance with permit restrictions. To ensure these trace levels of pollutants are removed prior to discharge of the treated groundwater, a final process has been included in the system – granular activated carbon (GAC).

The Ott/Story/Cordova GWTS utilizes two Calgon Corporation Model 10 carbon adsorption systems, both consisting of two vertical pressure vessels, each containing 20,000 pounds of granular activated carbon. The GAC used at the site is delivered in bulk trailers for unloading directly as a water slurry into an empty adsorber.

Effluent from the tertiary sand filters flows by gravity from the top of the filter vessels into the effluent storage tank (ET-531), a 4000 gallon capacity closed vessel located in the GTB. Two effluent discharge pumps (DP-540, 541) are provided that pump water from this tank through the carbon adsorber vessels also located in the GTB. Water that has passed through the adsorbers flows through the NPDES monitoring station and then on to the facility's surface water discharge point in the north branch of the Muskegon River, some three miles away.

A small control box containing an electrical disconnect and a hand/off/auto switch is mounted next to each effluent pump. Manually operated inlet and outlet valves are provided for each pump, as well as a motor operated valve (MOV) on each discharge line. In the event automatic control of the MOV is lost, it may be manually actuated by pulling up on the hand wheel provided and adjusting the valve position by turning the wheel.

Normally, the effluent pump switches are placed in "auto," and the system is controlled from the DCS work station on screen E2. This screen contains graphic representations of the effluent storage tank (ET-531), the two effluent pumps (DP-540, 541), the MOVs in the discharge lines of these pumps (MOV-540C, 541C), the two carbon adsorber systems (CA-551A, 551B and CA-552A, 552B), and the NPDES monitoring station (NMS-561). Start and stop control of the pumps is available by clicking on the appropriately labeled boxes. Readouts of storage tank volume in gallons, run time for the pumps in hours, MOV position in % open, and water flow through each of the adsorber units and the NPDES station in both gpm and totalized in 100,000

gallon increments are also available on this screen. Water chemistry parameters continuously monitored at the NPDES station, temperature (°F), conductivity (mMhos/cm) and pH (S.U.), are also indicated on screen E2.

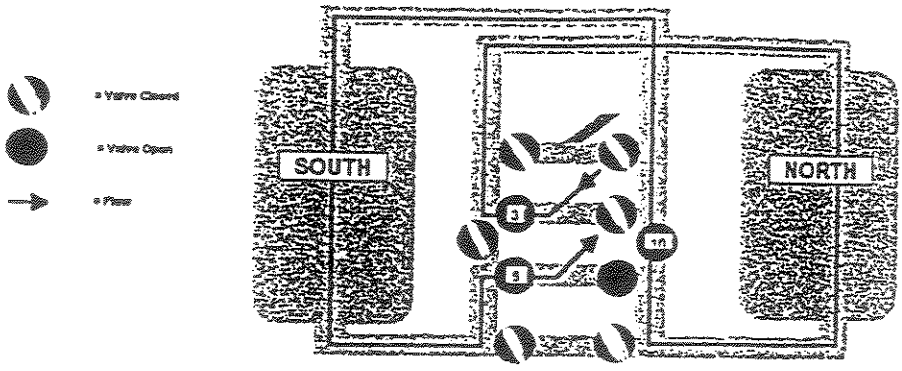
The storage tank volume is also represented by shading to illustrate how much of its capacity is occupied by water. High and low alarm levels may be input, but the levels entered during facility start-up do not usually need adjustment. The low level alarm shuts off the effluent pumps to prevent them from running dry, while the high level alarm notifies operators that corrective action is required. When the tank is full and tertiary filter effluent flow continues to enter, it overflows to the GTB sump, where it is pumped back to the DAS splitter box.

Flow through the carbon adsorbers is automatically controlled by the DCS by opening and closing the MOVs in response to the water level in the storage tank. Screen E6 allows the desired tank level set point to be input, as well as other process parameters, such as how quickly the MOV is adjusted in response to a change in tank level. These parameters, all input during plant start-up, generally do not require changing. Automatic and manual control selection of the MOVs is possible from this screen also, but the automatic mode of operation, where the MOVs are adjusted according to tank level, is usually desired.

The carbon adsorption system is operated in a downflow mode with the granular carbon beds in a series configuration at a flow rate compatible with the design capacity of the unit (500 gpm max.) Flow is directed into the top of the first vessel (lead adsorber) and flows down through the carbon. From the bottom of the lead adsorber, the water stream flows into the top of the second vessel (polish adsorber). Effluent from the polish vessel flows through the NPDES monitoring station, then on to the facility discharge point. A valving arrangement installed between the two vessels allows operator control over the direction of flow through the system. The valving arrangement used when using the north vessel as the lead adsorber and the south vessel as the polish adsorber is shown in figure 5.2. The valving arrangement used when using the south vessel as the lead adsorber and the north vessel as the polish adsorber is shown in figure 5.3.

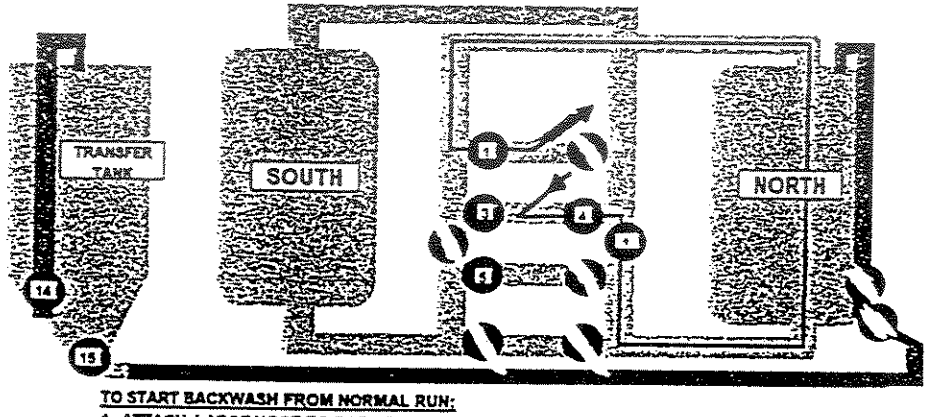
Initially, impurities in the water are adsorbed onto the carbon in the upper portion of the lead bed. As this top layer of carbon becomes saturated, adsorption takes place lower in the bed. Eventually, all the carbon in the lead adsorber becomes saturated and the contaminant concentration in the effluent from the adsorber increases until it approaches or equals the influent concentration.

1. NORMAL NORTH-LEAD GAC RUN



ONLY VALVES #3, #6, #10 ARE OPEN ...ALL OTHER VALVES ARE CLOSED

2. NORTH-LEAD GAC BACKWASH INTO SUMP

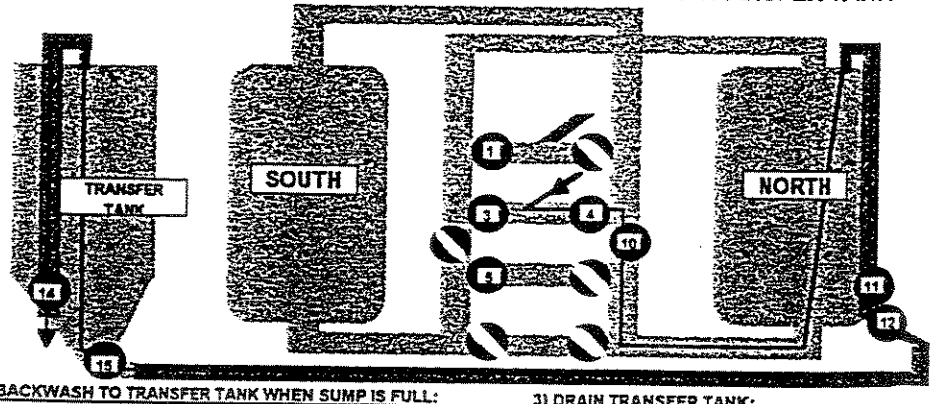


TO START BACKWASH FROM NORMAL RUN:

1. ATTACH LARGE HOSE TO BOTH THE LEAD GAC AND TRANSFER TANK
2. OPEN VALVES #14 & #15
3. CLOSE VALVE #3
4. CLOSE VALVE#5
5. OPEN VAVLE #1
6. OPEN VALVE #4 TO START BACKWASH

NOTE: BACKWASH AT 500GPM

3. NORTH-LEAD GAC BACKWASH INTO TRANSFER TANK



1) BACKWASH TO TRANSFER TANK WHEN SUMP IS FULL:

1. OPEN VALVE #11
2. CLOSE VALVE #1
3. PARTIALLY OPEN VALVE #12 AND OBSERVE SLOW DRAINING
4. WHEN THIS WATER IS CLEAR OR OVERFLOW PIPE ON TRANSFER TANK OVERFLOWS, BACKWASH IS COMPLETE

2) CHANGE VALVING BACK TO NORMAL RUN:

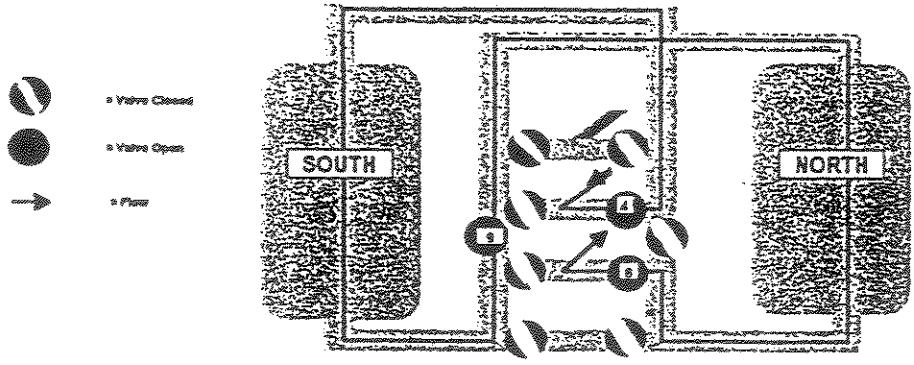
1. CLOSE VALVE #4 TO STOP INFLUENT
2. CLOSE VALVE #11
3. OPEN VALVE #5
4. OPEN VALVE #3

3) DRAIN TRANSFER TANK:

1. CLOSE VALVE #15
2. OPEN VALVE #12 TO RELIEVE PRESSURE
3. DISCONNECT LARGE HOSE, AT GAC, PLACE OR SUMP
4. PARTIALLY OPEN VALVE #15....DRAIIN SLOWLY

Figure 5.2

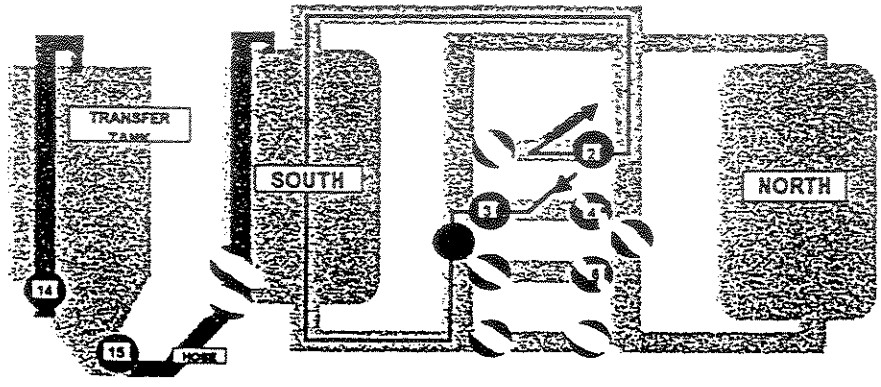
1. NORMAL SOUTH-LEAD GAC RUN



ONLY VALVES #4, #6, #9 ARE OPEN ...ALL OTHER VALVES ARE CLOSED

---

2. SOUTH-LEAD GAC BACKWASH INTO SUMP



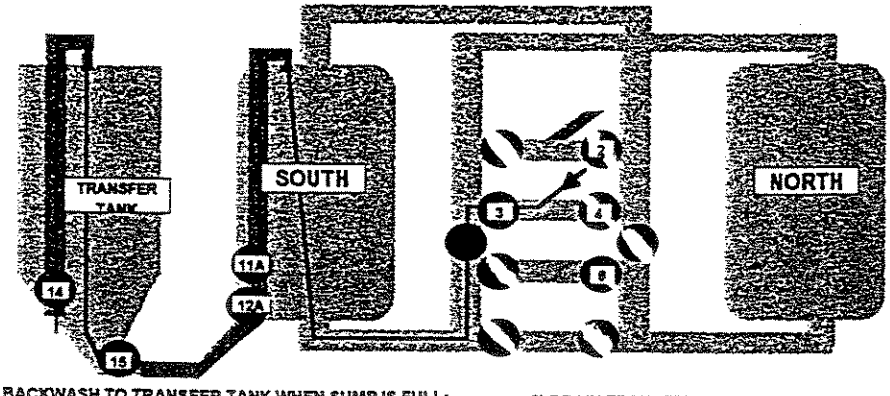
TO START BACKWASH FROM NORMAL RUN:

1. ATTACH LARGE HOSE TO BOTH LEAD GAC AND TRANSFER TANK
2. OPEN VALVES #14 & #15
3. CLOSE VALVE #4
4. CLOSE VALVE #6
5. OPEN VAVLE #2
6. OPEN VALVE #3 TO START BACKWASH

NOTE: BACKWASH AT 500GPM

---

3. SOUTH-LEAD GAC BACKWASH INTO TRANSFER TANK



1) BACKWASH TO TRANSFER TANK WHEN SUMP IS FULL:

1. OPEN VALVE #11A
2. CLOSE VALVE #2
3. PARTIALLY OPEN VALVE #12A AND OBSERVE SLOW DRAINING
4. WHEN THIS WATER IS CLEAR OR OVERFLOW PIPE ON TRANSFER TANK OVERFLOWS, BACKWASH IS COMPLETE

2) CHANGE VALVING BACK TO NORMAL RUN:

1. CLOSE VALVE#3 TO STOP INFLUENT
2. CLOSE VALVE #11A
3. OPEN VALVE #6
4. OPEN VALVE #4

3) DRAIN TRANSFER TANK:

1. CLOSE VALVE #15
2. OPEN VALVE #12A TO RELIEVE PRESSURE
3. DISCONNECT LARGE HOSE, AT GAC,PLACE OVER SUMP
4. PARTIALLY OPEN VALVE #15....DRAIN SLOWLY

Figure 5.3

5.3.5.2 GAC Transfer

When the carbon in a vessel is exhausted, indicated by contaminant breakthrough, the spent carbon must be removed and replaced with fresh, regenerated carbon. The spent carbon is transferred from the adsorber to a bulk trailer by first ensuring the adsorber is full of water. The vessel is then pressurized using compressed air to facilitate the carbon transfer to the trailer. Compressed air is supplied to the vessel using flexible air hoses from the high pressure air compressors located in the GTB. Once the spent carbon transfer operation is complete, a charge of fresh carbon is transferred from another bulk trailer into the empty adsorber. This is accomplished by first filling the bulk trailer containing the dry GAC with water and placing a water cushion in the receiving adsorber vessel. The bulk trailer is then pressurized with compressed air to facilitate carbon transfer into the adsorber. When the lead bed is taken out of service for carbon changeout, flow is directed to the polish adsorber for uninterrupted operation. After the first adsorber is emptied and then filled with fresh carbon, it can be placed on line in the polish position. At this point, the second adsorber becomes the lead bed.

To prepare for spent carbon transfer from the north adsorber vessel while maintaining groundwater flow through the south adsorber, the valves are configured as illustrated in figure 5.4. Carbon transfer from the south adsorber vessel, while maintaining groundwater flow through the north adsorber, is accomplished by configuring the valves as illustrated in figure 5.5. A triple hopper bulk trailer is used during carbon changeout. This trailer is constructed to hold 10,000 pounds of carbon in each end section and 20,000 pounds in its center section. The triple hopper trailer brings fresh carbon to the site in the two end sections. First, spent carbon is transferred to the center section of the trailer, then the fresh carbon is transferred from the end compartments to the adsorber.

The adsorber carbon outlet line, illustrated in figure 5.6, is connected to the empty compartment of the bulk trailer using 4-inch flexible hose. The vessel is pressurized with compressed air to about 15 psi and the carbon discharge valve opened to transfer spent carbon to the trailer. Septa valves on the trailer are opened as it starts to fill with carbon slurry to drain off excess water.

Figure 5.4 North Transfer South On-Line

CALGON

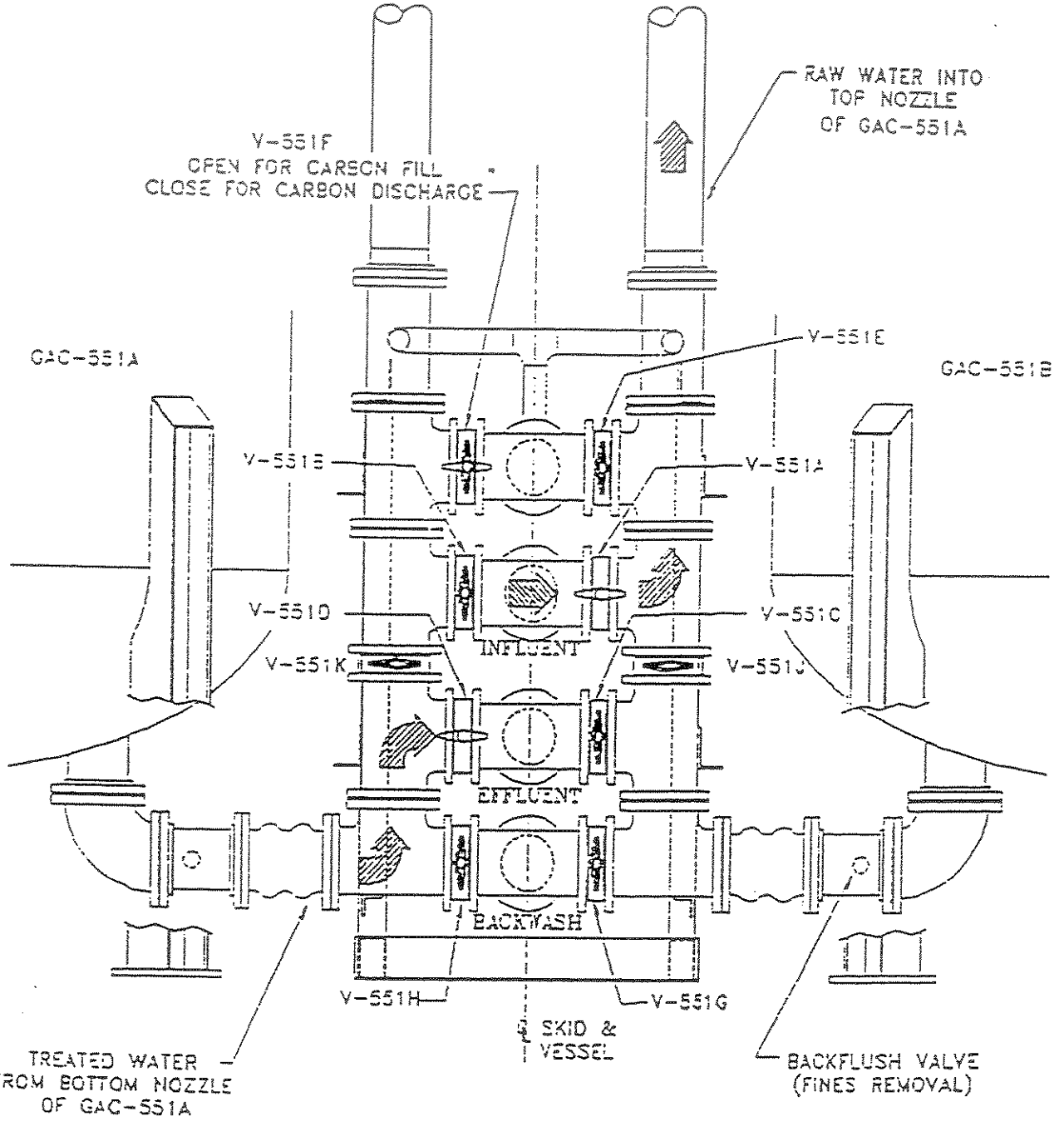
CALGON CARBON CORPORATION

SYSTEM OPERATION

VALVE DIAGRAM

Figure 5.4

VESSEL GAC-551A ON-LINE
VESSEL GAC-551B CRBN.TRANSFER



North Transfer South On-Line

CALGON

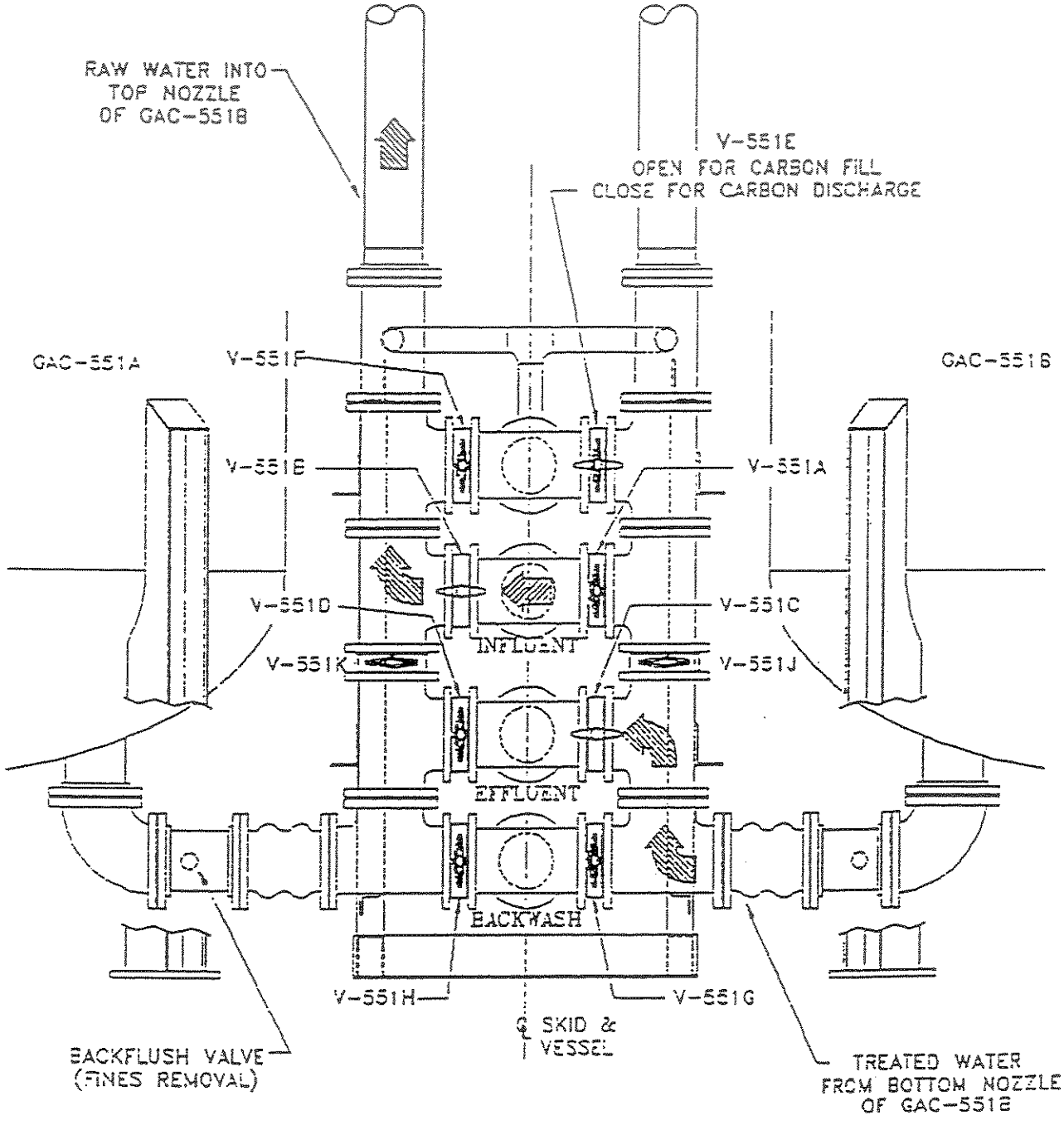
CALGON CARBON CORPORATION

SYSTEM OPERATION

VALVE DIAGRAM

Figure 5.5

VESSEL GAC-551B ON-LINE
VESSEL GAC-551A CRBN.TRANSFER



South Transfer North On-line

SYSTEM OPERATION

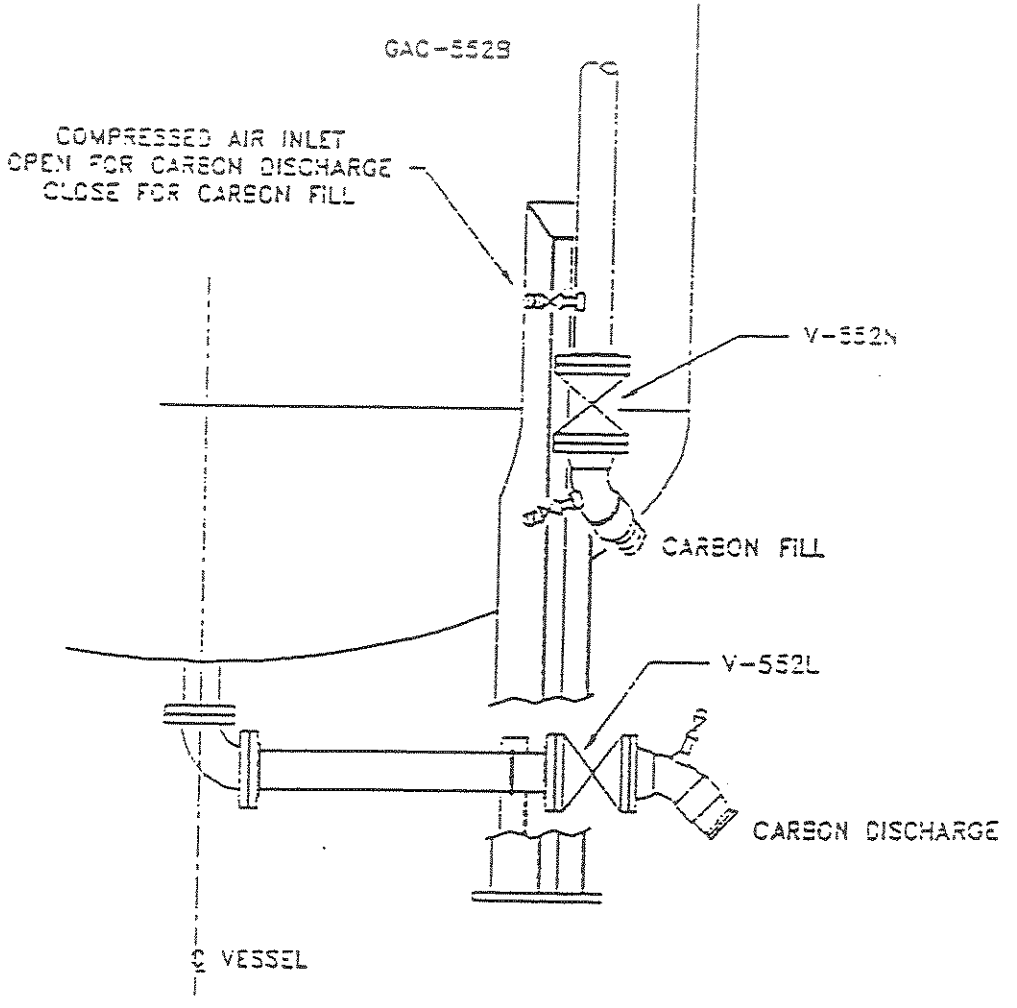
VALVE DIAGRAM

CALGON

CALGON CARBON CORPORATION

Figure 5-6

VESSEL GAC-552A ON-LINE
VESSEL GAC-552B CRBN.TRANSFER



Carbon Outlet/Fill Lines Diagram

The transfer should take about 20 to 30 minutes, and ends with a loss of pressure in the adsorber and the sound of air in the transfer line. At the end of transfer, the compressed air line valve is closed and the tank and line are vented through the trailer vent. The water from the carbon slurry must continue to be drained, and this process may be speeded up by pressurizing the trailer to about 15 psi with compressed air. When the carbon is completely drained and excess pressure is vented from the trailer, all valves should be closed and hoses disconnected. The spent carbon is returned to the manufacturer for reactivation.

Fresh carbon is transferred to the empty vessel in a slurry using compressed air. The trailer compartment containing dry granular carbon is first filled with 4000-5000 gallons of water to create the slurry. The 4-inch flexible carbon slurry hose is connected to the adsorber fill line (see figure 5.6) and the trailer carbon discharge line. A water cushion of about 3000 gallons is put into the adsorber to protect the underdrain system, then the trailer is pressurized to about 15 psi and the carbon slurry transferred to the empty adsorber by opening the delivery valves. Shortly after starting the transfer, the adsorber drain line should be opened to reduce the amount of water that overflows the vessel at the end of the transfer. Prior to disconnecting any lines, the air supply must be shut off, and the trailer and all transfer lines must be vented. The fresh carbon must be properly wetted and backwashed prior to placing the tank in service as the polishing vessel.

In a typical bed of fresh carbon, the pore volume is approximately 40% of the bed volume. The carbon, which is shipped dry, contains air in these pores. Therefore, the carbon must be properly deaerated or "wetted" prior to being placed on line. If this is not done, the air within these pores will displace into the void spaces between carbon particles during operation and cause high pressure drop and channeling in the adsorbers. This could cause premature breakthrough of contaminants, as this air will not migrate out of the bed during normal downflow operation.

The time required for wetting is a function of liquid temperature and viscosity. Generally, a minimum wetting period of 24 hours is required using water at ambient temperatures, although a period of up to 72 hours is preferred for complete wetting. After wetting, the adsorber should be backwashed to remove air and segregate the carbon by size. Alternatively, the bulk trailer

containing fresh carbon may be filled with water and allowed to stand several hours before transferring to the adsorber vessel. After the fresh carbon is transferred, the adsorber should be backwashed to eliminate any remaining air. If the unit must be placed on line before the carbon has been properly wetted, the adsorber should be drained of water and backwashed when the pressure drop becomes prohibitive to achieving desired flow rates or after two days of operation, which ever occurs first.

5.3.5.3 GAC Backwash

Backwashing is a procedure involving running clean, contaminant-free water upflow through the adsorber. Backwashing of a carbon bed can be done after fresh carbon has been transferred into an adsorber and properly wetted, or during operation to remove sediment from the top of the bed. The reasons for backwashing before placing fresh carbon on line are to: (1) size segregate the carbon so subsequent backwashing will return the carbon to the same relative position in the bed, (2) remove any remaining air from the bed, and (3) remove carbon fines which can lead to excessive pressure drop and flow restriction. Backwashing is done during operation to remove: (1) sediment which has collected on top of the bed, (2) carbon fines that may plug the underdrain nozzles, and (3) air that is binding the bed. The need to backwash is indicated by an increased pressure drop across the bed of 5 to 10 psi over its original operating value. Pressure drop across each vessel is registered on differential pressure gauges mounted on the valving arrangement located between the two tanks.

The differential pressure gauges provided measure the pressure drop across each bed. Pressure drop through an adsorber system is a function of several factors, including:

1. Pressure drop through the carbon beds,
2. Nozzle and piping pressure drop
3. Flow rate, viscosity, and density of the liquid.
4. Solids build-up on top of the bed.
5. Bacteria growth or chemical precipitation in the bed.
6. Gas build-up in the bed.

To prevent damage to the system in the event the pressure limitation of the vessels is exceeded, pressure relief devices are provided in the adsorber vent lines. The pressure relief device is a graphite disk with a burst pressure of 75 psi. The recommended maximum operating pressure is 75% of the burst pressure (57 psi) and any long-term pressure above this value will begin to stress the disk. If a pressure disk ruptures, flow through the vent line is directed to the GTB sump. The sump pumps will not be able to handle the excessive flow and a high sump level will soon be activated. The affected carbon system must be immediately taken off line, the ruptured graphite disk replaced, and the vessels backwashed to reduce the system pressure that caused the disk to rupture.

The clean external source of backwash water is provided from the effluent storage tank by the operating effluent pump. Both the lead and polish adsorbers must be taken out of service during the backwash event, however, facility effluent may continue through the other parallel Model 10 system. If the effluent flow is too high for one unit, a manually actuated valve that bypasses the GAC system and directs effluent flow directly to the NPDES monitoring station may be opened.

The valving arrangement used to backwash the north GAC vessel is shown in figure 5.2, and for south vessel backwash in figure 5.3. Typically, the backwash water flow rate is maintained at 500-650 gpm by selecting manual operation of the effluent pump MOV on the DCS monitoring screen E8. The valve % open value may then be input to achieve the desired flow rate. Effluent tank level must be observed to ensure neither high nor low levels are reached during the backwash event. All valves should be operated in a slow and even motion. Abrupt opening and closing of the valves can shock the system with the resulting pressure surges. Since complete shut-off of flow while pumps are operating may damage the pumps, the valves must only be operated in the proper sequence provided in order to always maintain flow through the system.

Backwash water enters the vessels through the effluent line and flows up through the underdrain and the carbon bed. Backwash water is normally discharged to the GTB sump, however, if storage capacity is exceeded, backwash may be directed to the empty carbon transfer tank provided as illustrated in figures 5.2 and 5.3. The transfer tank may then be drained to the GTB sump at a later time when pumping capacity is available. During backwashing, the backwash

water discharge from the vent line is observed for clarity to determine the duration required to clean the carbon bed. When normal downflow operation is restarted (by following the valve sequencing directions provided in figures 5.2 and 5.3) the initial 5 to 15 minutes of effluent flow will be dark due to the presence of a small quantity of carbon fines. Under normal operating conditions, the effluent will quickly clear up.

5.3.5.4 Alternate GAC System Operation

The series operation described in the preceding sections is the preferred operational mode, for it achieves the most efficient use of the carbon. Parallel operation is, however, sometimes used in situations where the carbon usage rate is low, the mass transfer zone is short, and/or the flow rate is high. In parallel operation, the influent flow is directed to both vessels through a common inlet line by configuring the valves as shown in figure 5.7. When contaminant breakthrough is detected from either or both vessels, the system is shut down for carbon replacement. Since uninterrupted groundwater extraction and treatment is desired at this facility, parallel operation is not desirable and should be avoided.

If the effluent from the tertiary sand filters is of a quality that meets NPDES discharge limits, flow through the GAC vessels may be reduced or eliminated altogether in order to extend bed life. A manually actuated bypass valve is provided to direct flow from the effluent pumps directly to the NPDES monitoring station. Adjustment of this valve may be used to divert a portion of the total flow, or all the flow if the inlet and outlet valves to the GAC vessels are closed. Flow through the bypass line is indicated on the DCS monitor screen E2. Operators must be very confident of tertiary effluent water quality to employ this operation mode, as any breakthrough of contaminants is likely to result in noncompliance with facility discharge restrictions.

For further information, consult the Calgon Carbon Granular Activated Carbon System O&M Manual (submittal no. 0277.0-11460-400) located in the Operator Office.

CALGON

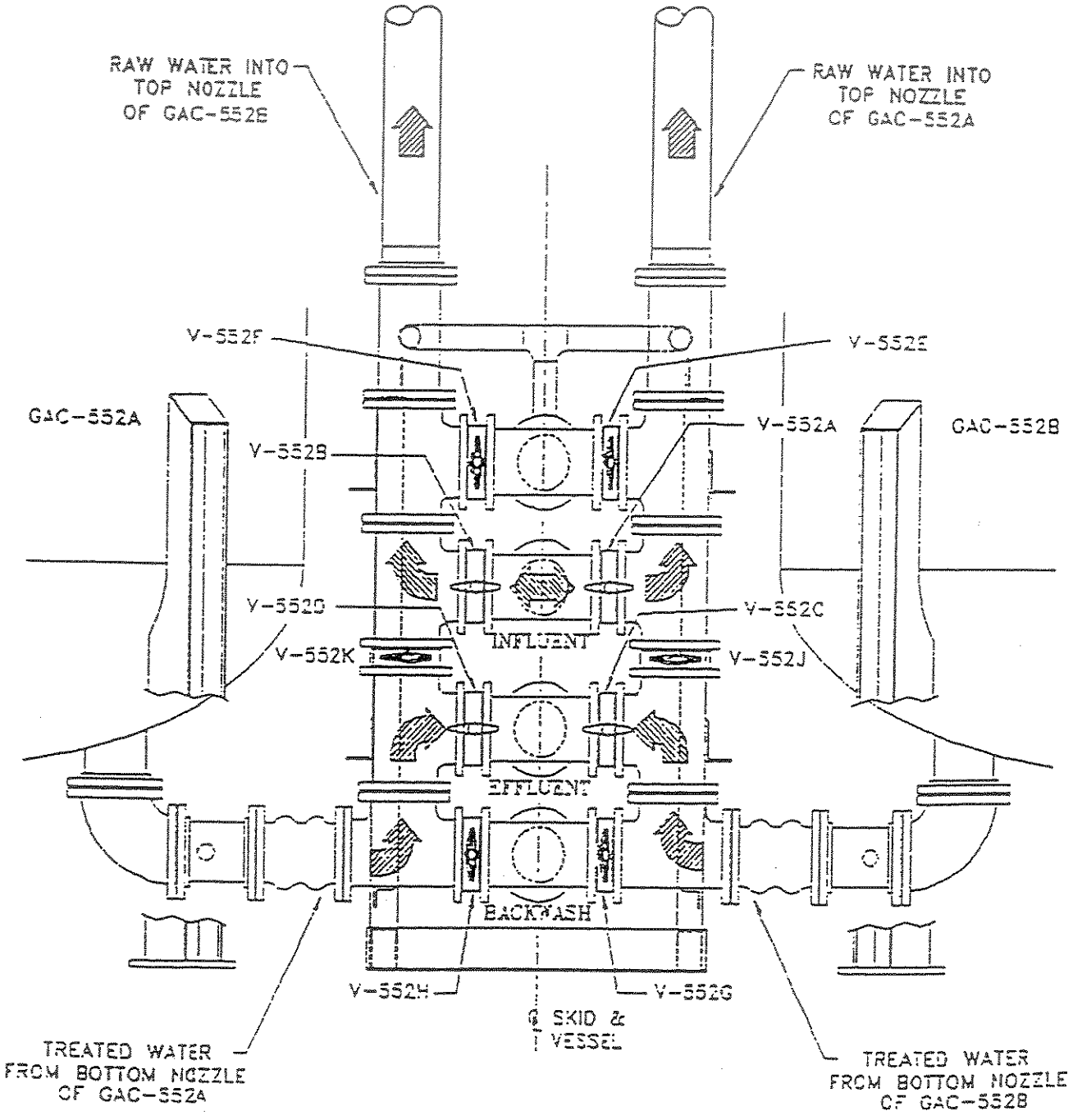
CALGON CARBON CORPORATION

SYSTEM OPERATION

VALVE DIAGRAM

Figure 5.7

PARALLEL FLOW
VESSELS GAC-552A AND GAC-552B



GAC Parallel Flow Diagram

5.3.6 NPDES Monitoring Station

The National Pollutant Discharge Elimination System (NPDES) Monitoring Station provided consists of a flow-through horizontal section of facility discharge pipe. Probes installed in this line continuously monitor effluent pH, conductivity and temperature. A chart recorder is provided to maintain a permanent record of these parameters, as well as the effluent flow rate from a magnetic flow meter. As well as displaying these values on the chart recorder readout, they may also be observed on the DCS Effluent screen E2.

A sampling port is installed on the discharge line with a ball valve that allows collection of effluent grab samples for required chemical analyses. A composite sampling system is also installed to allow the collection of composited effluent samples for the analyses that require this type of sample. The compositor may be operated to collect a sample manually, according to an adjustable time period between samples, or as a flow-proportional sample collected after a selected flow volume has passed through the meter. In any of the modes, the sample is collected by opening an air-operated cylinder that draws a small sample from the effluent discharge line and releases it into a teflon line that discharges to a five gallon glass sample jar. The sample container is housed inside a refrigerator to preserve the sample at 4° C during the sampling interval.

Control of the composite sampler is from the panel mounted next to the NPDES station. On/Off selection is possible from a switch provided on the external panel, as well as selection of the desired manual/timed/flow-proportional operational mode. The actual duration of the timed interval and the flow volume interval between samples are set by accessing controllers located inside the panel.

5.3.7 Solids Handling

Waste solids generated by treatment facility processes accumulate in the PACT system aerobic digesters. Compressed air may be provided to the digesters to prevent anaerobic conditions from occurring and facilitate volatile destruction to reduce the volume of solids requiring disposal.

Periodically, the air supply is shut off to allow solids settling and the removal of the clear water in the upper portion of the digester by lowering the decant line below the water level. Clear supernatant flows by gravity to the Sludge Treatment Building (STB) sump from where it is pumped back to the DAS splitter box to be treated by plant processes.

Solids that settle out in the aerobic digesters are pumped to the sludge holding tank (ST-701) using either of the two sludge transfer pumps provided (STP-211, 212). Manual valves on the inlet and outlet lines of these pumps allow control over which digester sludge is withdrawn from. The pumps are located in the Sludge Pump Building and control panels there allow on/off control of the pumps and selection of the automatic or manual operational mode. When operated in "manual," the pumps are operated using on and off buttons on the control panel. In "auto", the pump may be started and stopped by clicking on in the appropriate buttons on the DCS monitor PACT Systems screen D2. Start times and pumping durations in minutes may also be input on this screen to operate the pumps for selected intervals each day. In addition, a high level in the sludge holding tank, as determined by a pressure gauge at the bottom of the tank and selected using the DCS work station, will shut the transfer pumps off to prevent over-flowing the tank.

The Solids Handling Schematic screens (F1 and F2) on the DCS monitor illustrate the sludge holding tank, the four filter feed pumps (FFP-710, 711, 712, 713) the three filter presses (FP-721, 722, 723), the plate wash system and the acid wash system. Sludge volume in the tank is determined by a pressure transducer located at the tank bottom and displayed in gallons. Tank contents are also graphically represented by shading of the storage tank illustration. Contents of the tank may be kept mixed using the mechanical mixer (M-701) suspended from the top of the tank. Operation of the mixer is controlled using the on/off switch located on the panel mounted on the tank top, and an indicator provided on the DCS screen illuminates in red when the mixer is running. An hour meter is provided to show how long the mixer has been in operation, to assist in determining when maintenance in required.

5.3.7.1 Lime Conditioning System

The waste sludge generated at this facility is dewatered using pressure filters. Often, chemical conditioning of the sludge is necessary to improve its dewatering characteristics. A lime feed system (LFS-645) is provided that uses pebble lime stored in the lime silo (LS-645), mixes it with water to produce a slurry, then delivers it to the sludge holding tank (ST-701) through 3-inch piping where the sludge receives conditioning. Two lime slurry pumps (LSP-640, 641) are provided to deliver the slurry to the sludge tank. The entire lime slurry make-up system is housed inside the lime silo. Lime is transferred to the silo from a bulk delivery trailer by connecting the trailer outlet to the tank fill line with 4-inch flexible hose, then pressurizing the bulk trailer compartment with compressed air to push it into the silo. Air displaced from the silo passes through filter bags mounted on top of the silo to prevent lime dust from being released to the atmosphere during lime transfer.

A volumetric feeder (LVF-646) delivers dry lime into a lime slurry tank (LST-642) where it is mixed with water to make the slurry. A mechanical mixer is installed on this tank to keep lime in suspension and prevent it from settling out. Water is supplied from the plant effluent pressure line and, when the system is operating in the preferred automatic mode, electrodes in the tank control the on/off operation of the slurry make-up system based on the slurry level. Lime slurry is pumped from LST-642 to the sludge conditioning tank as needed. Most controls for the lime feed system are on the control panel housed in the lower level of the silo structure. Though individual components of the system may be temporarily operated using the supplied manual switches, to prevent over-feeding lime or water, these controls should be operated in "auto."

The system as a whole may be monitored from the DCS monitor Lime Feed System screen F4. Components that are operating, including the volumetric feeder, the slurry mixer and the pumps, will be illuminated in red. A system trouble indicator is provided that flashes on and off in red if there is a problem with the system, and the typical alarm sequence is generated. However, the only operational control available from the DCS work station is overall start or stop of the entire system.

Due to the high PAC content of the waste sludge, its dewatering characteristics are already very good and lime conditioning has not been required. In fact, dry lime has never been delivered to the storage silo and no slurry has been generated. The manufacturer has tested all system components, however, and determined them all to be operable. If and when lime conditioning is initiated, slurry feed adjustment must be made to balance the slurry delivery rate with the slurry make-up rate. If it is found that slurry delivery by the pumps exceeds the make-up capacity of the system, throttling valves or a recirculation line may have to be installed on the lime slurry pump discharge pipes.

5.3.7.2 Sludge Dewatering System

Graphic representations of the four filter feed pumps and the three filter presses are provided on DCS monitor screens F1 and F2. Any components in operation are illuminated in red, and only very limited operational control is possible from the DCS work station. Normally, the system will be operated from the control panel in the STB, though emergency shut-off of the filter feed pumps may accomplished using the mouse and the DCS. Alarm conditions originating in the sludge dewatering process will be indicated on the DCS monitor by flashing red icons, and the typical alarm sequence will be initiated.

5.3.7.2.1 Filter Press Operation

The JWI filter press operations manual should be referenced to obtain directions to operate this system, for the controls are fairly sophisticated. In general, the system uses hydraulically-assisted diaphragm sludge pumps to push liquid sludge through filter cloths mounted on a plate and frame press. Clear water passes through the cloths while solids contained in the sludge are trapped on the cloth surface. Since the sludge is pumped to the filter at pressures exceeding 200 psi, the press must be clamped tightly closed using a hydraulic pump and cylinder to prevent leaks. When a filter cycle is started, water passes quickly through the press and is discharged to the STP sump, from where it is pumped back to the DAS splitter box for treatment through plant processes. As solids accumulate on the cloths, the filtration rate decreases. Filtrate water from each press passes through a weir tank that maintains a certain level until flow decreases to the

point that the tank level drops far enough to clear an electrode mounted in the tank. This signals the system that the filtration cycle is complete, shuts off the filter pump and sequentially opens valves on compressed air lines that blow out the sludge remaining in the fill line and water remaining in the drain line.

When a filter cycle is complete, the operator may discharge the filter cake by opening the press plates and allowing the captured solids to fall into a container located beneath the press. Monthly analyses are performed on the sludge cake for characterization to determine if the solids are hazardous. To date, the dewatered sludge has been characterized non-hazardous and it is disposed of in a landfill by a contracted solid waste hauling company.

Again, operation of this system requires sufficient training and close observation when initiating a run. In general, the following procedural steps are followed to operate the filter presses. This example uses filter feed pump FP-712 to pump sludge from the sludge holding tank through filter press FP-721. The operator will first configure the manual valves in and out of FFP-712 to allow flow from the holding tank to enter the pump and discharge from the pump to enter FP-721.

- Ensure the FP-721 'Plate Shifter Home' light and the FP-721 'Plate Washer Home' lights are both illuminated on the filter press control panel.

- Press the FP-721 'Press Ram Open' push button.

- Press the FP-721 'Press Ram Close' push button. This will close the filter press ram and clamp the plates closed. While the press is closing, the 'Press Ram Close' push button light will flash. This light will remain steadily on when the press is clamped to the proper hydraulic pressure. Sufficient hydraulic clamping pressure is usually reached within four minutes.

- Close the drip trays below the press by first depressing the "Drip Trays Stop' button on the filter press control panel.

- Press the 'Drip Trays Closed' push button. While the drip trays are closing, the 'Drip Trays Closed' push button light will flash. This light will remain steadily on when the drip trays are fully closed and mechanically latched in place.

- Select FFP-712 by depressing the FFP-712 'Start' push button on the dewatering system control panel. The FP-721 'Feed Start' push button light will flash.

- Press the flashing FP-721 'Feed Start' push button. Air actuated valves will open directing discharge from FFP-712 to FP-721. During the filtration cycle, the FP-721 'Feed Start' push button will remain illuminated.

- The filtration cycle will proceed automatically through the sludge feed, core blow and air blow sequences.

- When the filtration period is over, the FP-721 'Cycle Complete' push button light will be on and the FP-721 'Feed Start' button will be off.

- Open the drip trays by first depressing the FP-721 'Drip Trays Stop' push button on the filter press control panel.

- Press the 'Drip Trays Open' push button. This button will flash while the drip trays are opening and be steadily illuminated when the drip trays are fully open.

- To initiate the discharge of filter cake, first depress the FP-721 'Press Ram Stop' push button on the filter press control panel.

- Press the FP-721 'Press Ram Open' push button. While the ram is opening, the 'Press Ram Open' light will flash. When the ram is fully open, this light will remain steadily on.
- Depress the FP-721 'Plate Shifter Stop' push button on the filter press control panel.

- Press the FP-721 'Plate Shifter Start' push button. The plate shifter will automatically shift filter plates one at a time to allow cake discharge. A plastic scraper is used to manually dislodge cakes that stick to the filter cloths. If the operator is unable to clean the cake off a cloth before the shifter moves to the next plate, a portable push button controller is used to pause the shifter. The plate shifter may then be restarted on the filter press control panel after the cake has been scraped off.

The volume of waste sludge currently generated at the facility is less than originally anticipated. Operation of the dewatering system is intermittent and the filter presses may not be operated for weeks at a time. Only two 20-yard containers are kept on site, under two of the filter presses. When both are full, the contracted solid waste hauler replaces them with two empties. Alternating the filter press that is not being used (since it doesn't have a container beneath it) keeps the run time hours on the presses approximately equal.

5.3.7.2.2 Plate Wash System

The filter press cloth wash system provided is used to remove solids that have accumulated in the pores of the filter cloths from prior filtration cycles and restrict the flow of filtrate water through the filter. The need for cloth washing will be recognized by increased filter cycle times and increased difficulty in getting the dewatered sludge cake to release from the filter cloths.

The cloth wash system is totally automated and is started by depressing the 'Plate Wash Start' button. The operator must first close the drip trays that collect dirty wash water and direct it to the STB sump. The press ram must be in the open position prior to starting the wash cycle. The operating system consists of a 1000 gallon clean water storage tank located on the floor of the STB, a high pressure water pump mounted next to the storage tank, and piping that carries this water to special high pressure spray nozzles attached to a bar that moves up and down between filter plates. As the plates shift during the cleaning cycle, the spray bar is repositioned to line up with the next plate opening. Proximity switches indicate the location of the bar to the pump so that high pressure (1500 psi) water is only directed through the nozzles when the sprayer is actually between two plates. Brushes along each side of the spray bar help minimize overspray.

Float switches inside the clean water storage tank regulate the water level maintained there. When the low level switch is activated, a solenoid valve opens, directing water from the plant effluent pressure line into the tank. This solenoid valve closes when the high level switch is activated. If the solenoid valve fails to close, a high-high level alarm is activated that signals operators the water inlet must be manually closed to prevent tank overflow. If the solenoid valve fails to open when called for and the tank level continues to drop during a wash cycle, a low-low level switch activates an alarm and shuts the washwater pump off to prevent it from running dry.

An additional selector switch is provided on the control panel that allows the operator to choose how many passes the pressure wash arm makes between two plates before shifting to the next pair. The options available are 1, 2 or 3 passes. If care is taken to make sure no spray nozzles are plugged, a single pass generally provides sufficient cloth washing. In practice, using plant effluent as wash water caused some problems with the solenoid valve on the pressure pump discharge line. Fine PAC particles in the water caused the valve to sometimes stick open after the spray arm had cleared the filter plates (spraying wash water all over the STB), or sometimes to stick closed so that the cloths were not washed as the spray arm moved up and down between plates. Using cleaner potable water to fill the washwater tank has eliminated this problem.

5.3.7.2.3 Acid Wash System

After a long period of use, the filter cloth pores may become so badly plugged that pressure washing does not alleviate the condition. An acid wash system has been provided that allows a hydrochloric acid solution to be recirculated through the press and dissolve solids from the cloths.

The acid wash system is not as automated as the pressure wash. The solution must be prepared by first opening a water valve to nearly fill the acid wash tank (AWT-731). Then concentrated hydrochloric acid is delivered from a 55 gallon drum to the acid wash tank using a hand plunger pump. The actual acid concentration required will have to be determined by practice, but a 1-2%

solution should probably be used initially. A mechanical mixer (ATM-732) is installed in the acid wash tank to thoroughly mix the diluted acid.

The filter press to be acid washed must be clamped closed using the ram closing procedure described for running a filtration cycle. Manual valves on the press discharge line are configured to direct filtrate flow back to the acid wash tank rather than to the STB drain. After ensuring the inlet and outlet valves on the acid wash pump (AWP-734) are open, this pump may be started from the filter press control panel and the acid solution recirculated through the filter press. Though start and stop functions for both the plate wash pump and the acid wash pump are controllable from the DCS workstation on the Solids Handling Schematic screen F2, this is not good practice. An operator should be present, controlling these functions in the STB, to make certain the systems are operating properly.

Consult the JWI Sludge Dewatering System O&M Manual (submittal no. 274.2-11430-1300), located in the Operator Office, for more information concerning pressure filter operation.

5.3.8 Static Aerator

Treated groundwater from the Ott/Story/Cordova Groundwater Treatment Facility is discharged to the north branch of the Muskegon River. To prevent this discharge from having a detrimental effect on aquatic life in the receiving stream, it is desirable to maintain a dissolved oxygen (D.O.) concentration greater that 6 mg/L in the effluent. During normal operation, plant effluent D.O.'s typically exceed this value; however, under certain circumstances, dissolved oxygen levels may drop. This can occur during periods of very warm weather, when process flows are lower than normal, and when fresh granular activated carbon has been put on-line.

To ensure appropriate D.O. concentrations are always present in the facility's effluent, a Parkson Corporation OxyCharger Model OC-184 static aerator has been installed in the effluent line several hundred yards before the outfall. Flow through the OxyCharger results in considerable turbulence and agitation, raising the D.O. levels beyond 6 mg/L. Since the system has no power

requirements, continuous flow through the OxyCharger is maintained, even when additional oxygenation is not needed. D.O. concentrations at the outfall are typically near saturation, greater than 9 mg/L.

Three subsurface valves are provided in the effluent line, on the east side of the OxyCharger structure, to regulate flow through the static aerator. To initiate flow through the OxyCharger, all three valves should be open. These are 12 inch diameter gate valves labeled EFF-TRD-37 (OxyCharger influent), EFF-TRD-38 (OxyCharger bypass), and EFF-TRD-39 (OxyCharger effluent). Valve number 38 should then be closed slowly, and the gradual flow of water through the static mixer observed to ensure the structure does not over-flow. When the valve is completely closed, all effluent flow is passing through the OxyCharger, which is the normal operating condition.

If it becomes necessary to take the OxyCharger out of service for cleaning, repair or other maintenance procedures, bypass valve number 38 is first fully opened, then influent valve number 37 is closed and, finally, effluent valve number 39 is closed. Water remaining in the OxyCharger can damage the thin walls of the unit if it freezes, so this must be removed with a portable pump if the system is taken off-line during cold weather conditions. In general, the OxyCharger Static Aerator is designed to operate with minimal operator attention, and no routine adjustments are necessary.

6.0 MAINTENANCE

6.1 INTRODUCTION

Interruption of process operation can be avoided by proper maintenance of equipment, structures and other facilities. Adhering to a specific maintenance program schedule is essential to ensure that equipment not frequently observed in operation is not neglected.

Four types of maintenance are performed by operations personnel. The first, preventive maintenance, is performed to prevent breakdown, reduce wear and extend the life of equipment and structures. This important part of the maintenance program is performed while the plant is in operation and includes routine inspection of equipment, lubrication, and minor adjustments. Predictive maintenance involves oil analyses, vibration testing of rotating equipment and infrared testing of electrical switchgear to determine if service is needed. Corrective maintenance consists of repair and non-routine maintenance tasks, including changing drive belts, pump packing, and replacing worn bearings, and can generally be performed while the process is in operation or with a minimum of down time. Finally, major equipment repair or alteration may be required and usually takes place when a process unit is out of operation. This maintenance may require hiring outside contractors to complete the work and may be very costly.

The goal of the maintenance program at this facility is to perform the proper preventive and predictive maintenance so that the need for corrective and repair maintenance is minimized. Accurate record-keeping and tracking allows reoccurring corrective maintenance tasks to become more predictable, so that operators will be prepared to make repairs with minimal disruption of facility operations.

6.2 GROUNDWATER EXTRACTION SYSTEM

6.2.1 Safety

Many maintenance tasks performed on the groundwater extraction system involve working in confined spaces, near electrical components, with hazardous chemicals, and may likely result in contact with contaminated groundwater or hazardous air spaces. Discussion concerning appropriate safety procedures to be followed when working in these areas is provided in Operations Section 5 and in the Site Safety and Health Plan, part of this manual, by reference, in section 11.

Public safety is a concern, as well, when performing maintenance at remote extraction well locations and valve vaults, due to their close proximity to residential housing. Prior to performing any procedures using chemicals or whenever contaminated groundwater is being brought to the surface, notification of affected homeowners is required. Scheduled maintenance at these sites is only performed during hours when the residents are not typically home. If any procedures are being performed that could potentially expose neighbors to contaminated water or gases, or if work cannot be completed during the period they are not home, temporary relocation of the residents may be provided for the duration of the event.

6.2.2 GWES Maintenance

General maintenance at well and valve vault locations and remote control cabinets include ensuring that security measures (padlocks and intrusion alarm systems) are present and operable. The areas are kept free of debris, weeds and grass are mown in the summer months, and accesses are plowed in the winter. Surface water that leaks into the vaults is pumped regularly; the need for this is indicated by high vault sump alarms. Electrical boxes and metal piping surfaces are monitored for corrosion, and rusty surfaces are promptly sanded and repainted. Every three months, valves are exercised to ensure they remain operable. Electrodes in the magnetic flow meters installed on the discharge line of all extraction wells are cleaned with a

soap solution every three months, or sooner if unusual or erratic flow measurements are observed.

All wells are subject to biofouling. This is especially true of those placed in a nutrient rich environment such as that found at Ott/Story/Cordova. Once a well has been turned on, nutrients, organisms and metals required for metabolism begin to concentrate across the cone of influence. Within a short period of time the bacteria begin to establish and produce biomass. This biological slime accumulates the organics and metals along with the dead bodies of the organisms and fines moving toward the well. As the biofilm develops, it begins to retard flow and eventually will clog the well. Once this has taken place, well rehabilitation is required. To allow the wells to operate at a high level of efficiency for an extended period of time, a preventative maintenance (PM) program has been prescribed for the extraction wells at O/S/C.

The USACE has developed an extraction well preventative maintenance schedule based on specific pumping capacity measurements calculated as described on the following page. Table 6.1 illustrates the preventative maintenance schedule form which is completed to determine whether PM for a particular extraction well is required.

There are three satellite wells associated with each extraction well, drilled in the same aquifer about six feet away from the extraction well. Cleaning solutions added to these satellite wells can be drawn through the biofouled formation and gravel pack by operating the extraction well. The acid blend used for extraction well PM consists of 535 gallons of clean potable water, 55 gallons of 70% hydroxyacetic acid, 10 gallons of ARCC Sperse CB-4 polymer and 50 lbs of 99% sulfamic acid. This solution is utilized to perform the typical Blended Chemical Heat Treatment (BCHT) process on a single extraction wells.

An acid cleaning unit has been constructed to facilitate preparing and dispersing the acid blend. The unit consists of a 750 gallon elliptical polyethylene tank mounted on a trailer that allows transport of the solution to the extraction wells. Flexible hosing and valving connected to a corrosion-resistant pump allow the solution to be thoroughly mixed prior to its injection into the satellite wells. Ingredients must be added to the tank in the order given above. The pump is then

operated to recirculate the solution until the powdered sulfamic acid dissolves. The chemical heating and pumping system is designed to be completely self-contained to allow the process to be performed at remote locations. A 16 HP gasoline-fueled engine is mounted on the trailer and drives both an electrical generator that provides 120 volt, 18.75 amps at 3600 rpm, and a stainless steel corrosion-resistant gear pump capable of delivering the chemical solution at about 3 gpm. The blended chemical is pumped first through a diesel-fueled heat exchanger that raises its temperature to between 130° and 170° F, and then into the well being treated through a ¾" hydraulic feed hose. The trailer and equipment are hauled to the extraction well site and the following steps taken to perform the required PM:

1. After measuring and recording groundwater levels in the three satellite wells, the extraction well and its rehabilitation well, and the designated monitoring well, turn off the extraction well pump and close the manual valve to the collection system.

2. Insert the hydraulic delivery hose into the first satellite well and add 100 gallons of acid blend from the top of standing water to the bottom. The pump delivers solution at about 3 gpm, but if the rate is too fast for the well to take and it begins to over-flow, a manual valve on the discharge line can be throttled to slow the flow, or a bypass valve may be opened to return a portion of the flow back to the holding tank. Repeat this process on the other two satellite wells.

3. Deliver the remaining 300 gallons of the blended chemical solution into the rehabilitation well, from the top to the bottom of the well screen.

4. Open the valve to the collection system.

5. Turn the extraction well pump on for 15 to 30 seconds, collect a sample from the well sampling port and check pH using litmus paper. Repeat until a 1.0 log drop in pH occurs to ensure acid solution has been drawn into the extraction well.

6. Leave extraction well off overnight. On the following morning, measure and record static water levels in the three satellite wells, the extraction well and its rehabilitation well, and the designated monitoring well. Restart the extraction well at the desired pumping rate.

7. Record the same water level measurements 24 hours after restarting the extraction well to determine any improvement in pumping capacity realized from the BCHT process.

United States Army Corps of Engineer personnel use the data from the PM Schedule Form to direct operators which extraction wells are to be cleaned and when. When the wells to be cleaned are near residential areas, the USACE will also contact neighbors to inform them that cleaning activities are planned and the area should be avoided. Operators involved with extraction well PM must wear proper protective attire, including acid-resistant coveralls, rubber boots and gloves, and face shield. Refer to the SSHP for a discussion concerning the use of personal protective equipment.

PREVENTIVE MAINTENANCE SCHEDULE

ALL WELLS	Specific Capacity Measurements[1]	Every Two Weeks
EW-1 to EW-5, EW-7, EW-9 to EW-11	Preventive Maintenance	Every Six Months
EW-6a, EW-8	Preventive Maintenance	Every Two Weeks[2]

**Note that declines in specific capacity of 10-20% require BART test kit evaluation of biofouling. If specific capacity declines more than 20%or the BART test kit indicates significant biofouling growth, the wells will immediately undergo preventive maintenance.

[1]Specific capacity (SC) is calculated by dividing the well pumping rate in gallons per minute (GPM) by the drawdown in the pumping well and it is expressed as gallons per minute per foot of drawdown. Drawdown is the difference between the non-pumping or static water level (SWL) in the extraction well and the pumping water level (PWL). [GPM / (SWL-PWL] = SC.

As a practical matter the extraction wells will not be turned off to measure the static water levels used to calculate specific capacity. To compromise and get good data, the water level measured at a nearby monitoring well will be used as the static reference groundwater elevation. The wells to use for each extraction well are listed in the table below.

[2]The biweekly schedule may be increased to four weeks for one or more of these wells after measuring specific capacity data for two to three months and analyzing the results.

BASELINE SPECIFIC CAPACITIES

Well No.	Average Specific Capacity [3] (GPM/ft)	Observation well
EW-1	15.89	W-105i
EW-2	6.52	W-106i
EW-3	9.87	W-107i
EW-4	5.65	W-111i
EW-5	5.14	W-115i
EW-6a	3.9	W-119i
EW-7	4.8	W-121i
EW-8	3.0	W-125i
EW-9	4.0	RW-9NW
EW-10	5.6	W-101i
EW-11	5.35	W-101i

[3]These values are derived from performance data collected from 11/97 to 03/02. Some anomalous readings have been omitted from the averages due to interferences of line back pressure.

TABLE 6.1

OTT/STORY/CORDOVA EXTRACTION WELL PREVENTATIVE MAINTENANCE SCHEDULE FORM

DATE:

Well No.	Average Specific Capacity (ASC) (GPM/FT)	Static Well Number	Extraction Well Rehab Well Static	SWL	PWL	SWL-PWL	GPM	SC [SC = GPM/ (SWL-PWL)]	% of ASC (SC/ASC x 100%)	Corrective Action Required *	Remarks
EW-1	15.89	W-105i									
EW-2	6.52	W-106i									
EW-3	9.87	W-107i									
EW-4	5.65	W-111i									
EW-5	5.14	W-115i									
EW-6a	3.9	W-119i	NONE								
EW-7	4.8	W-121i									
EW-8	3.0	W-125i									
EW-9	4.0	RW-9NW									
EW-10	5.6	W-101i									
EW-11	5.35	W-101i	NONE								
					Total Plant Flow						

* Corrective Action Required

ASC = Average Specific Capacity
SWL = Static Water Level or non-pumping well level (taken from the Static Well Number)
PWL = Pumping Water Level (taken from Extraction Well)
GPM = Extraction well pumping rate in gallons
SC = Specific Capacity = [GPM/(SWL-PWL)]

REVISION: # 9, (13 March 02)

6.3 GROUNDWATER TREATMENT SYSTEM

6.3.1 Safety

Many maintenance tasks performed at the groundwater treatment facility involve working in exclusion zones, confined spaces, with electrical components, with hazardous chemicals, and may likely result in exposure to contaminated groundwater or hazardous atmospheres. Discussion concerning appropriate safety considerations when working in these areas is provided in Operations Section 5 and in the Site Safety and Health Plan, part of this manual, by reference, in Section 11.

6.3.2 GWTS Maintenance

General maintenance at the groundwater treatment facility includes housekeeping and grounds maintenance, including lawn mowing and snow plowing. Leaks and spills are promptly cleaned up and the cause quickly resolved to prevent injury and exposure to hazardous chemicals and contaminated groundwater. Exterior surfaces of structures, tanks, piping and control boxes are monitored for corrosion and rusty surfaces are sanded and repainted. Tools and spare parts are maintained in an orderly fashion in their designated storage areas to make them readily available when needed. Shelving has been provided in the north end of the electrical room in the GTB to store replacement parts. This area is also used as a work area and includes work benches and stocked tool boxes.

6.4 COMPUTERIZED MAINTENANCE PROGRAM

The maintenance program utilized at this facility is installed on a computer work station located in the operator office. The program, called "Maintain It", is comprehensive and includes all the maintenance components required by the project contract documents.

The computerized maintenance program contains all system equipment in a Master Equipment List (MEL). A printout of the MEL is provided in Appendix F. Each system component sheet lists all required scheduled maintenance procedures by frequency and maintenance action. At the beginning of each week, the program is accessed to generate work orders for lubrication and preventive maintenance tasks that have become due based on component operating hours. Work orders are distributed to operators who complete the maintenance task, document their actions on the work order, then turn them into the Maintenance Foreman. The Maintenance Foreman files the hard copy of the closed work order (in a file cabinet in the operator office reserved for this purpose) and also closes the completed work order in the computer program, which starts the time interval for the next maintenance period. An example Work Order is provided as Figure 6.1.

FIGURE 6.1

Work Order

10/20/98 SVERDRUP ENVIRONMENTAL 1

WO No.	9807-126	(PM)	Task No.	EF-951
EXHAUST FANS FOR BUILDINGS				

Equip No.	EF-957-A	EXHAUST FAN IN BLOWER BLD. WEST	
Location	BLOWER BUILDING	Department	OTHER
Sub-location 1		Cost Center	
Sub-location 2		Warranty Exp. Date	
Sub-location 3		Meter Reading	_____

Originator		Phone No.	
Request Date		Ext.	

Start Date	9/14/98	Craft	
Finish Date		Crew Size	
Priority		Est. Labor Hours	
RFO Code	_____ ( )		
Downtime	_____		

Labor

Employee	Craft	Name	Hours

Comments and Notes

Task Instructions

Most of the motors have sealed bearings and need no maintenance. There are a few motors and fans that have grease zerts which needs to be greased yearly.
Make a visual inspection of the fans and of the air intake louvers.

Parts

Item No.	Qty Reqd.	Description	Qty Used

Each work order describes the maintenance task to be performed, the tools required to complete the work, and any lubricants or replacement parts needed. When necessary, specific repair and maintenance instructions are included, and if unusual circumstances were encountered when previously performing the work, these are noted as well. The Maintain It program keeps track of corrective maintenance required on the system components, making it possible to predict future equipment failure and the need for repair or replacement. Use of the maintenance program allows a complete history of operation for each piece of equipment to be compiled.

The Maintain It program provides links between the equipment data sheets and manufacturer and vendor information. This allows quick access to contact names, addresses and telephone numbers of each specific component. The vendor list for this facility is provided as Appendix G, the lighting and lamp inventory is listed in Table 6.2, and a lubricant inventory sheet is attached as Table 6.3.

SPARE PARTS: LIGHTS

AROUND SITE:	USING	Approx. Yr. Usage
All Exterior Entrance Door: Philips 70 Watt C70S62	20	2
All Exterior Standing Floods: Philips 150 Watt USA 5B-2 C150556	2	2
All MCC/Switch Stations: GE-755	120	50
Well Breaker boxes: GE-757	18	18
All Alarm Beacons: GE High Intensity 40 Watt Bulbs	6	18
Exit Sign Lights: Regular Bulb: F7BXSPX27/F7BX827	14	14
Emergency Back-up Bulb: General Electric L4 909	12	0
Emergency Back-up Lights: No Numbers	0	0
Heat Tracing Boxes: Neon glow indicator 240V	25+	5
GWTB		
Large Ballast Lights: Philips 400W C400S51	19	3
Small Ballast Lights: Philips100W C100S54/M	7	2
Carbon Silo: GE-Rough Service 75 Watt	4	2
Cabon Feed Panel(inside) GE-755	15	15
SyncroFlo: GE- 120MB	5	5
Phos/Ferric Pumps-GE-120MB	10	10
Sump Pump Alarm Beacons: 40 Watt Clear Bulb	1	1
All ceiling fluorescents: 48" 34 Watt	35 x 6	10
Bathroom: U shaped	1	1
STB		
Large Ballast Light: Philips 400W (C400S51)	18	2
Small Ballast Lights: Philips 100W C100S54/M	16	2
Sludge Press Control Panels: GE- 757	200	50
Polyer pumps: GE-949	3	3
Overhead Fluorescent: 48" Fluorescent 34 watt	24	10
Freeze Protection Panels: GE-755	2	2
Sump Pump Alarm Beacons: 40 Watt Clear Bulb	1	1
CLARIFIERS/PCT/701 Tank:		
Inside/outside: 100WS54	13	2
Rake Drive Panels for 200/300 Tanks: GE- 755	12	6
SPH		
Small Ballast Lights: C100WS54/M	5	2
Pump Control Panels: GE- 757	36	18
TOU		
Control Room Ceiling: 96" 110 Watt F9CT12/CW/HO	8	4
Fan Room Large Ballas Ballast: M59/400W BU/MH	4	1
Above VFD Fan: 48" fluorescent F32T8-SP41	4	2
Inside Control Panel: 48" Fluorescent 40W	1	1
24" Fluorescent 20W	1	1
Tou Control Panels: GE- 755	25	12
Freeze Protection Panels: GE-755	2	2
NaOH fill port light: GE-755	1	1
BLOWER ROOM		
Small Ballast Lights: Philips 100W C100S54/M	12	5
Flourence Ceiling Lights: 4ft. 34 watt	32	16
Blowers Control Panels: GE- 120MB	10	20
Freeze Protection Panels: GE-755	2	2

TABLE 6.3

LUBRICANT INVENTORY

SPARE PARTS: OIL/GREASES

SITE EQUIPMENT	OIL/GREASE/HYDRAULIC	APP. GALLONS USED PER YEAR	STOCK NOW
Blower Building			
Centac Compressors	Mobil DTE 797 Light	63-126	55
	Cenlube	5 Tubes	5
T.O.U. Building/Pad			
Recycle Pumps	Regal R&O 100	5	2
Sludge Pump House			
RSP&STP Pumps	Regal R&O 100	10	2
Sludge Treatment Building			
Filter Feed Pumps			45
Gear Oil	Meropa 220	5	0
Hydraulic Oil	1515 Transformer Inhibited	36	0
Pressure Wash Pump	Meropa 320	3	0
Filter Press	HD46	80	7
701 Tank Gear Drive	Regal R&O 150	32	5
All Sumps	1515 Transformer Inhibited	4	0
Ground Water Bldg.			
Tertiary/Effluent Pumps	Rando HD68	15	20
All Clarifyers			
Gear Drives	Mobil Gear 636	11	12
All Air Compressors			
All compressors	Aeon 500	25	15
All other greases			
Common	Starplex #2	20	20
Motor	Polystar RB2	10	10
All Diaphram Pumps	Rando HDZ-15	1	0
All other equipment:			
Tractor			
Gear Oil	API Serv Class. GL-5	0	0
Engine Oil	SAE10w30/15w30	2.25 Quarts	0
Hydrualic Oil	Low viscosity Hy-guard	6 Quarts	0
Fork Lift			0
Engine Oil	SAE10w30/15w30	5 Quarts	
Hydraulic Oil	Low viscosity	7.3 Quarts	0
Transaxle Oil	TA-30/H-200	15 Quarts	0
Small Engines:	15-40 Synthetic	5 Quarts	5

6.5 COMPONENT AND EQUIPMENT TESTING

6.5.1 Vibration Testing.

Testing is performed, on an annual basis, to confirm equipment is performing in accordance with the normal application of the equipment. The testing will show that the equipment operates free of excessive noise or vibration. This test will be performed by a testing service with the experience and necessary equipment to test, analyze and report on the equipment tested. A report will be submitted indicating the results of the test, including; all tests performed, the results of the tests and suggestions for remedying problems, if noted. The following is a list of equipment to be tested:

Tertiary pumps: TP-510 & TP-511; Discharge pumps: DP-540 & DP-541; Return Sludge Pumps: RSP-220, RSP-221, RSP-222, RSP-320, RSP-321 & RSP-322; Return Transfer Pumps: STP-211 & STP-212; Differential Fans: DF-130, DF-131 & DF-132; Activated Sludge Blowers: ASB-220, ASB-221 & ASB-222; Diffused Air Stripper Blowers: DASB-120, DASB-121 & DASB-122; RTO-Exhaust Fan REF-1 & Chamber Purge Fan: CPF-1.

6.5.2 Flow Meter & Level Indicator Calibration.

Flow meters and level meters are to be calibrated annually to ensure they are recording accurately. The testing will be performed by a company with the experience and equipment to accurately calibrate the meters. A report will be submitted which documents the conditions prior to and after the calibration. The following flow meters will be calibrated: All ten (10) flow meters from each extraction vault and FE-515, FE-524, FE-551, FE-552, FE-553, FE-561, FE-221, FE-222, FE-321 and FE-322. The following level indicators shall also be calibrated: LE-401, LE-531, LE-602, LE-635 and LE-701.

6.5.3 Infrared Testing.

Testing is performed to ensure that equipment is properly wired and connected. The purpose of the testing is to scan the electrical system and search for abnormal heating conditions. This testing is performed on an annual basis and shall be performed by a business that specializes in this type of inspection. A report will be submitted which includes: equipment being tested, results of each inspection, probable causes of problems and recommendations for repairing deficiencies. The report consists of a written document of all work performed with photographs of areas which require work. The following equipment shall be tested:

Control Cabinets:

LOCATION	EQUIPMENT INDENTIFICATION
Blower Building	DB-120
	DB-121
	DB-122
	ASB-220
	ASB-221
	ASB-222
	CC-101
	AC-902
	AC-903
	MCC-102
	AC-902
	AC-903
	Freeze Protection System
	Air Condensing Unit
T.O.U. Building	Wheelabrator Clean Air Systems - outside panel
	Wheelabrator Clean Air Systems - inside panel
	Wheelabrator Clean Air Systems - HCL Scrubber
	Regenerative Thermal Oxidizer
	VFD Fan
	Main VFD Fan
	Purge Fan
PCT-201	Rake Drive
PCT-202	Rake Drive
C-301	Rake Drive
C-302	Rake Drive
Sludge Pump House	

LOCATION	EQUIPMENT INDENTIFICATION
Sludge Treatment Building	AC-901
	CC-201
	MCC-201
	AC-751/AC-752
	Freeze Protection System Panel
	Return Sludge Pumps Flow Control Panel
	Filter Press Main Control Cabinet (mezzanine)
Sludge Pumphouse	PP-102
	MCC-103
	Sludge Pump Control Panel
Groundwater Treatment Building	PCS-660
	Ferric Chloride Metering Pumps FCP-600, FCP-601
	Ferric Chloride Tank Level
	Phosphoric Metering Pumps: PAP-630, PAP-631,
	PAP-632
	Phosphoric Acid Tank Level
	Sump Pump Control Panel
	NFT Tank Inlet Valve 410
	Emergency Lighting Equipment
	Telephone System
	NWBS-935
	MCC-301
	MCC-302
Fire Pumphouse	All control cabinets.

Power Panels:

LOCATION	EQUIPMENT INDENTIFICATION
Blower Building	PP-101
Sludge Pumphouse	PP-102
Groundwater Treatment Building	PP-301
	PP-302
Laboratory	PP-303

Disconnects:

LOCATION	EQUIPMENT INDENTIFICATION
Blower Building	EF-957A
TOU Building	VFD Fan
Outside	DF-130, DF-131, DF-132
Sludge Treatment Building	AWP-734
	PWP-742

LOCATION	EQUIPMENT INDENTIFICATION
Sludge Treatment Building (con't)	EF-951
	EF-952A
	EF-952B
Groundwater Treatment Building	TP-510
	TP-511
	PCS-660
	DP-540
	DP-541
Extraction Wells	EW-1 to EW-10

Motors:

LOCATION	EQUIPMENT INDENTIFICATION
Sludge Pumphouse	RSP-221
	RSP-222
	RSP-321
	RSP-322
TOU Building	VFD Fan
Groundwater Treatment Building	TP-510
	TP-511
	DP-540
	DP-541

6.5.4 Air Compressor Preventative Maintenance

Preventative maintenance and inspection shall be performed on a quarterly basis for the Ingersoll-Rand compressors. The compressors to be serviced are as follows: DB-120, DB-121, DB-122, ASB-220, ASB-221 and ASB-222. A service contract will be set up with the Ingersoll-Rand Company or an authorized I-R dealer to provide this service. The service will undertake a program which integrates diagnostic testing with a preventative maintenance program. It will include as a minimum:

- Testing shall be performed on each compressor to aid in determining its condition.
- The controls of the equipment will be calibrated to keep efficiency at the highest possible level.

- Deficient components will be noted and recommendations for their replacement will be recorded.
- A written report will be provided with each inspection. It will include a thorough description of the inspections performed and recommendations to enhance the current preventative maintenance program.
- The compressor's operation will be reviewed with plant operators to assure they are operating the equipment as to provide the best performance.
- This item shall include all costs of labor, equipment, travel and perdiem, required to perform maintenance inspection on the air compressors.

6.5.5 Mass Spectrometer and Gas Chromatograph Maintenance.

A service contract shall be obtained for the mass spectrometer and the gas chromoatograph. The contract shall be an all inclusive contract which will cover all costs associated with calibration, cleaning and repair of the equipment. This contract will be set up with the Hewlett-Packard Company and will cover as a minimum:

- Two site visits per year where a preventative maintenance service is performed. These visits will require that all hardware be examined, cleaned, tested, adjusted and replaced and/or repaired as needed on both the mass spectrometer and the gas chromatograph.
- Cleaning of the mass specrometer ion source shall be performed once annually.
- Documentation will be provided for all inspections, repair and tests performed during the site visits. These reports will also include any recommendations suggested to optimize the equipoment's performance.
- All costs for consumables, parts, labor, travel and perdiem shall be included.
- Telephone support will be available to access product specialists during the hours of 0800 to 1700, Monday through Fridays.
- The repair, servicing, etc. of the personal computer, Chem Station software and purge and trap auto sampler will not be included in this maintenance contract.

7.0 LABORATORY TESTING

7.1 INTRODUCTION

The on-site and off-site laboratories provide analytical testing services for the Ott/Story/Cordova Groundwater Treatment Facility. Data generated and reported by the laboratories is used in optimization of plant treatment processes, in compliance with National Pollutant Discharge Elimination System (NPDES) Permit regulations, and in toxicity and risk assessment. A copy of the current NPDES permit MI0053309 is provided in Appendix I. Both the on-site and off-site Quality Assurance policies are built around the premise that all data must be scientifically valid.

7.2 SAMPLING AND PURPOSE

7.2.1 Sample Type and Frequency

Four types of samples are collected at the Ott/Story/Cordova site: wastewater, groundwater, air and sludge samples. Influent and effluent wastewater samples are collected at various locations throughout the plant for the purpose of NPDES permit compliance and to provide plant process information. Monitoring well and extraction well groundwater samples are collected to assess how the remediation process is progressing. Air samples are collected to verify that volatile contaminants are not escaping to the atmosphere, to determine air stripper efficiency, and to assess the concentration of volatile substances entering and exiting the thermal oxidation system, expressed as a destruction percent. Sludge samples undergo TCLP analysis for waste disposal purposes.

The plant effluent sample is collected as either a grab or composite sample as required by the NPDES permit. A grab sample is taken at any time and the results represent the conditions at that particular moment. A composite sample is composed of a mixture of flow proportional grab samples collected every two thousand gallons in a glass container over a 24 hour period. Samples are collected on either a daily, weekly, monthly, quarterly or semiannual basis. Table 7.1, Sampling Plan for Ott/Story/Cordova GWTF, provides a comprehensive list of both sample type and frequency of collection, and analytical testing.

Table 7.1 Sampling Plan for Ott Story GWTF

Laboratory Analysis schedule Cordova GWTF Revision Date 09/17/03	Identification	Alkalinity	CBOD	Carbon - Biomass	COD	Hardness	NH3-N	TKN	NO3-N	NO2-N	Dissolved O2	pH	Total Phosphorus	Total Solids	Suspended solids	Suspended Ash	Temp	Specific Conductance	TOC	624,8260 (volatiles)	625, 8270B (semivolatile	608, (pesticides)	Mercury	Amen CN	Metals (Copper)	Oxygen Uptake Rate	Dissolved O2 Profile	TCLP	Settleability	Microscope Exam
Sample Location	#																													
DAS Influent	1																					Qc	Qg							
DAS Influent	1				5D	M	5D				5D	5D			W		5D			W	M									
PACT PCT-201	2	W	W		5D		5D	BW	BW	BW		5D	5D		W					W	M									
PACT PCT-202	3	W	W		5D		5D	BW	BW	BW		5D	5D		W					W	M									
1st stage aerat. PCT 201	4			W							5D	5D			5D	W	5D									5D	W		5D	5D
1st stage aerat. PCT 202	5			W							5D	5D			5D	W	5D									5D	W		5D	5D
2nd stage aerat.PCT 201	6										2D	2D			2D		2D													
2nd stage aerat.PCT 202	7										2D	2D			2D		2D													
PCT 201 1st clarif ovrflo	25				5D		5D					5D	5D		5D					W	M									
PCT 202 1st clarif ovrflo	26				5D		5D					5D	5D		5D					W	M									
Clarifier eff. C-301	8	W	W		5D		5D	BW	BW	BW		5D	5D		5D					W	M									
Clarifier eff. C-302	9	W	W		5D		5D	BW	BW	BW		5D	5D		5D					W	M									
Filter influent	10					M									2D															
Filter efluent	11														2D					W	M									
Lead GAC CA 551	12																			W	M									
Lead GAC CA 552	13																			W	M									
NPDES Station	14		Wc		5Dg	M	4Dc				5D	C/5Dg	4Dc		4Dc		C	C		Wg	Mc									
NPDES Station	14																		SA			Qc	Qg	SMg	Qc					
DAS offgas	15																			M										
TOU exhaust	16																			M										
Site Boundary Air	17																			SA										
PACT PCT 202 offgas	18																			SA										
PACT PCT 201 offgas	19																			SA										
Digestor PCT 201 eff.	20													R																
Digestor PCT 202 eff.	21													R																
Filter press filtrate	22													R																
Filter press cake	23													R														R		
Stream Discharge	24										W	W																		
RSP -221 discharge	31														5D															
RSP -222 discharge	32														5D															
RSP -321 discharge	33														5D															
RSP -322 discharge	34														5D															
Monitoring wells											Q	Q					Q	Q		Q	Q									
Monitoring wells																					Q									

Shaded indicates offsite test for contractor.

C	=CONTINUOUS WITH DCS	Q	=QUARTERLY	R	= AS REQUESTED
W	=ONCE PER WEEK	SA	= TWICE A YEAR	4Dg	= 4 DAYS/WEEK GRAB
Wc	= WEEKLY COMPOSITE	SM	= TWICE A MONTH	4Dc	= 4 DAYS/WEEK COMP
Wg	= WEEKLY GRAB	5D	= 5 DAYS/WEEK	5Dg	= 5 DAYS/WEEK GRAB
M	= MONTHLY	BW	= EVERY TWO WEEKS	Qc	= Quarterly comp
Mc	= MONTHLY COMPOSITE			Qg	= Quarterly grab

7.2.2 Analysis Type and Methods

7.2.2.1 Off-site Laboratory Testing

The off-site laboratory is responsible for the analysis of wastewater, groundwater, air and sludge samples. The off-site laboratory performs semimonthly, quarterly, or semiannual testing on both the plant influent and effluent samples. The influent sample is analyzed for mercury and pesticides. The plant effluent sample is tested for several parameters (amenable cyanide, total organic carbon, copper, and pesticides) to verify that the discharge limitations set forth in the NPDES permit are not exceeded. Duplicate samples are collected for the effluent and influent samples, once every 10 events or once a year, whichever occurs first.

The off-site laboratory is currently testing a maximum of 82 monitoring well samples for a select list of semivolatile analytes on a quarterly basis. Duplicate samples are analyzed once for every 10 samples. A client specified matrix spike and matrix spike duplicate are analyzed once for every 20 samples. In addition, sludge samples are analyzed by TCLP and air samples are analyzed for volatile constituents by the off-site laboratory. Method T014 volatile air analysis is performed monthly on the DAS offgas and TOU stack exhaust, and on the PCT offgases and site boundary semi-annually. Hydrochloric acid analyses are performed annually on the TOU stack exhaust, and dioxin/furan testing of the exhaust is performed as directed by the USACE. Table 7.2, Off-Site Laboratory Testing provides a list of select parameters, methods, detection limits and typical results.

Table 7.2 Off-Site Laboratory Testing

PARAMETER	METHOD	REPORTING LIMIT	UNIT	DAS INFLUENT	PACT/TOU EFFLUENT	MONITORING WELL
TOC	EPA 415.1	0.50	mg/L	-	2.0	-
Amenable Cyanide	EPA 335.1	0.010	mg/L	-	0.030	-
Copper	EPA 200.7	10	ug/L	-	<10	-
Mercury	EPA 1631	0.0005	ug/L	0.0010	0.0005	-
Pesticides, PPL	EPA 608	Variable	ug/L	<0.010	<0.010	-
Benzene	EPA TO14	0.5	ppbv	1200	32	-
1,2-Dichloroethane	EPA TO14	0.5	ppbv	150	5.4	-
n-Ethylaniline	8270C	5.0	ug/L	-	-	400,000
n,n-Dimethylaniline	8270C	5.0	ug/L	-	-	40,000

7.2.2.2 On-Site Laboratory Testing

The on-site laboratory performs tests on plant influent, plant effluent, and several other sampling locations throughout the plant. The stream discharge is analyzed for pH and dissolved oxygen and the effluent is analyzed for ammonia, total phosphorus, CBOD, total suspended solids, volatiles, and semivolatiles to verify that discharge limitations set forth in the NPDES permit are not exceeded. Several parameters (i.e., COD, microorganism evaluation, NO_2/NO_3) are analyzed on a daily or weekly basis to provide information necessary to optimize plant process operation.

Several influent and effluent sample points within the plant are monitored for volatile and semivolatile compounds to assess the reduction of these contaminants as the wastewater flows through various plant processes. Analysis of the lead granular activated carbon vessel effluent allows early detection of contaminant breakthrough so fresh carbon can be ordered to prevent the discharge of compounds such as 1,2-dichloroethane and tetramethylurea.

The on-site laboratory is currently testing at a maximum 85 monitoring well and eleven extraction well samples for a select list of volatile and semivolatile analytes on a quarterly basis. Duplicate samples are analyzed once for every 10 samples. A client specified matrix spike and matrix spike duplicate are analyzed once for every 20 samples. Table 7.3, On-Site Laboratory Testing, provides a list of select parameters, methods, detection limits and typical results.

Table 7.3 On-Site Laboratory Testing

PARAMETER	METHOD	REPORTING LIMIT	UNIT	DAS INFLUENT	PACT/TOU EFFLUENT	MONITORING WELL
Ammonia	EPA 350.3	0.10	mg/L	2.5	<0.10	-
$CBOD_5$	EPA 405.1	2.0	mg/L	-	<2.0	-
COD	EPA 410.4	20	mg/L	50	<20	-
Dissolve Oxygen	EPA 360.1	-	mg/L	2.5	8.5	-
Hardness	HACH	20	ug/L	120	120	-
pH	EPA 150.1	-	s.u.	8.1	7.4	-
Total Phosphorus	EPA 365.2	0.020	mg/L	-	0.040	-
TSS	EPA 160.2	4.0	mg/L	0-10	<4.0	-
Benzene	EPA 624	5.0	ug/L	300	<5.0	-
1,2-Dichloroethane	EPA 624	5.0	ug/L	150	1.5	-
Tetrachloroethane	EPA 624	5.0	ug/L	100	<5.0	-

Table 7.3 On-Site Laboratory Testing, Cont'd

PARAMETER	METHOD	REPORTING LIMIT	UNIT	DAS INFLUENT	PACT/TOU EFFLUENT	MONITORING WELL
Toluene	8260B	5.0	ug/L	-	-	100,000
1,2-Dichloroethane	8260B	5.0	ug/L	-	-	2000
Tetrachloroethane	8260B	5.0	ug/L	-	-	60,000
n-Ethylaniline	EPA 625	5.0	ug/L	400	<5.0	-
n,n-Dimethylaniline	EPA 625	5.0	ug/L	900	<5.0	-
n-Ethylaniline	8270C	5.0	ug/L	-	-	1,000
n,n-Dimethylaniline	8270C	5.0	ug/L	-	-	10,000

7.2.3 Purpose of Analyses

Proposed testing of analytes was based on plant design, known site contaminants, and NPDES effluent discharge limitations. Table 7.4, Purpose of Analyses, provides a brief description of the relevancy of each parameter.

Table 7.4 Purpose Of Analyses

Parameter	Description
Alkalinity	Alkalinity as $CaCO_3$ measures the acid-neutralizing capacity of the wastewater sample and is a potential cause of increasing pH.
Amenable Cyanide	Permit prohibited toxin.
Ammonia, Nitrogen	Biomass requires nutrients to reproduce. The nutrient nitrogen (as NH_3-N) is naturally present in wastewater. Ammonia has a permit discharge limitation.
Biochemical Oxygen Demand (BOD_5)	Oxygen is required to convert organic matter to a more stable form. BOD measures the wastewater's ability to biodegrade organic substances. BOD can not measure the level of toxins in the wastewater, since bacteria will not consume all toxic substances. Bacteria to food population must be maintained at a certain ratio. High BOD indicates increased food and requires reduced wasting of sludge. Wasting sludge eliminates excess microorganisms to prevent them from increasing beyond the food supply.

Parameter	Description
Biomass and Carbon	Biomass determination is a quantitative measurement of the amount of bacteria (microorganisms) present in the aeration tanks where biodegradation of organic matter occurs. Carbon determination is a quantitative measurement of the amount of carbon added by plant operators to the aeration tanks to adsorb organic toxins.
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	A natural process (nitrification) takes place in wastewater that uses oxygen to convert ammonia and organic nitrogen to nitrates. The difference between $CBOD_5$ and BOD_5 is that a nitrification inhibitor is added to allow for a more accurate assessment of the bacteria's oxygen requirements.
Chemical Oxygen Demand (COD)	COD analysis measures the amount of food (BOD) and organic toxins present in a sample that deplete oxygen. High COD indicates increased food and toxins in wastewater, and signals that powdered activated carbon (PAC) should be added to the aeration tanks to adsorb organic toxins. Low COD in plant effluent indicates that oxygen depleting substances are not being released to surface waters.
Dissolved Oxygen (DO)	The available oxygen for bacteria (biomass) is measured as dissolved oxygen. Low DOs result in unwanted filamentous bacteria that hinder the biodegradation process.
Hardness	Hardness as $CaCO_3$ is a potential cause of increasing pH and often results in the undesired deposition of insoluble salts (minerals) in plant piping and process tanks.
Metals: Hg, Cu	Permit prohibited toxin.
Microscopic Evaluation Of Organisms	Microscopic evaluation is a qualitative measurement of the types of indicator microorganisms present in the aeration tanks (mixed liquor) where biodegradation of organic matter occurs. Indicator organisms do not consume BOD as food. Good indicators confirm that bacteria (food consumers) are present. Bad indicators are higher life forms that consume bacteria and disrupt the biodegradation process.
Nitrate/Nitrite	Nitrate verifies that nitrification is occurring naturally. Nitrite is an intermediate step in nitrification when ammonia is oxidized to nitrate. $NH_3 \rightarrow NO_2 \rightarrow NO_3$
Pesticides (chlorinated)	Permit prohibited toxins.
pH	The acidity – basicity of wastewater, measured by pH, has a permit discharge limitation for the plant effluent. Microbial growth in aeration tanks is dependent on the wastewater pH.
Settleable Matter	Settleable matter is the mg/L of total suspended solids minus the mg/L of nonsettleable solids. This test determines the concentration of non-floating solids.
Total Kjeldahl Nitrogen (TKN)	This analysis is performed to determine the concentration of Organic Kjeldahl Nitrogen compounds of biological origin, such as amino acids and proteins. The difference between TKN and ammonia is the Organic Kjeldahl Nitrogen.

Parameter	Description
Total Phosphorus	Biomass require nutrients to reproduce. The nutrient phosphorus is added to the wastewater. Phosphorus (as total P) has a permit discharge limitation for the effluent.
Total Solids (TS)	This analysis is used to determine the solid content (dissolved and filterable) of return and waste activated sludge.
Total Suspended Solids (TSS)	Total suspended solids (filterable) data generates information vital to process optimization, such as, wasting, solids residence time, and carbon and biomass content.
Semivolatiles	Known site contaminants.
Volatiles	Known site contaminants.
Volatile Suspended Solids (VSS)	Volatile suspended solids (filterable, minus grit and ash content that remains after burning at 550° C) data quantitatively determines bimass and carbon content.

7.3 QUALITY CONTROL SAMPLES

To ensure that the data produced is of known accuracy, precision, completeness, comparability, and representativeness, both the on-site and off-site laboratory's QC programs include the analysis of quality control samples. These are defined as follows:

- Blanks (Field Blanks, Trip Blanks, Method Blanks) are used to assess the presence and level of contamination contributed to an analytical measurement by field procedures, sample transport, and/or the analytical system.

- Surrogates are used to assess the accuracy of a method to recover specific non-target analytes for a given matrix and sample. Surrogates have properties similar to the analytes of interest, but are not usually found in environmental samples. The use of surrogates is applicable to semivolatile and volatile analyses.

- Laboratory Control Samples are used to assess the accuracy of a method by measuring the recovery of a known spike in reagent-grade water.

- Laboratory Control Sample Duplicates are used to assess both the accuracy and precision (relative to the laboratory control sample) of a method by measuring the RPD and recovery of a known spike in reagent-grade water.

- Matrix Spikes are used to assess the accuracy of a method by measuring the recovery of a known spike in a sample matrix.

- Matrix Spike Duplicates are used to assess both the accuracy and precision (relative to the matrix spike) of a method by measuring the RPD and recovery of a known spike in a sample matrix.

- Laboratory Duplicates are used to assess the precision (relative to a sample) of a method in a sample matrix.

- Initial Calibration Verification (ICV) standards are used to assess the validity of an initial calibration. The use of an ICV is limited to inorganic parameters and volatile and semivolatile analyses that require Method 8260B or Method 8270C. The initial calibration curve shall be verified as accurate with a standard prepared from the same source for all inorganic parameters or a standard purchased from a second source for volatile and semivolatile analyses. In addition to an ICV, inorganic parameters are verified with a second source standard.

Table 7.5 summarizes the minimum frequency for the analysis of quality control measures. A batch consists of a maximum of 20 samples or is based on time. Depending on the type of inorganic parameter, a laboratory duplicate is provided rather than a matrix spike and matrix spike duplicate. Furthermore, a laboratory control sample is inappropriate for some inorganic parameters.

Table 7.5 Quality Control Minimum Frequency Summary

Type	Description	Frequency	Off-Site Inorganics	Off-Site Organics	On-Site Inorganics	On-Site Organics
Blank	Method of preparation	One per prep or analytical batch	√	√	√	√
Surrogate	Method of preparation	All organic QC and samples	NA	√	NA	√
Laboratory Control sample	Analyte-fortified Blank	One per prep or analytical batch	√	√	√	√
Laboratory Control Sample Duplicate	Duplicate of analyte-fortified blank	One per prep or analytical batch	√	√	NA	√
Matrix Spike	Analyte-fortified sample	One per prep or analytical batch	√	√	√	√
Matrix Spike Duplicate	Duplicate of analyte-fortified sample	One per prep or analytical batch	√	√	NA	√
Laboratory (Matrix) Duplicate	Duplicate of sample	One per prep or analytical batch	√	NA	√	NA
Initial Calibration Verification	According to parameter SOP	One per prep or analytical batch	NA	√	√	√

7.4 PROCEDURAL GUIDELINES, DATA REDUCTION, and VALIDATION

Both the on-site and off-site laboratories are required to meet similar specific minimum requirements for data reduction, review and validation. These procedures may vary slightly from on-site to off-site and from inorganic to organic laboratories, based on differences in instrumentation and methods used to generate analytical data.

7.4.1 Procedural Guidelines

A detailed Quality Assurance Project Plan (QAPP) must be provided by the contractor and be accessible to the appropriate staff. A general list of documents and topics contained in the QAPP and Appendices is provided below.

Quality Assurance Project Plan: Project Description, Organization, and Responsibility, Chemical Data Quality Objectives, Training, Sample Collection, Handling and Preservation Procedures, Sample Analysis Plan, Calibration Procedures and Frequency, Analytical Procedures, Internal Quality Control Checks, Data Reduction, Validation, and Reporting, Document Management, Assessment of Accuracy and Precision, Performance and Internal Audits, Preventative Maintenance, and Corrective Action.

Appendices:

Standard Operating Procedure for Organic Analyses: Traceability of Standards, Volatile Methods 5030B, 624, and 8260B (Compliant to USACE App. 1 Shell), Semivolatile Methods 3500B, 3510C, 625, 8270C (Compliant to USACE App. 1 Shell), Air Sampling, Operation of the GCMS Systems, Preparation of Trip Blanks, Verification of Water Quality, and Cleaning Sample Bottles and Glassware.

Standard Operating Procedure for Inorganic Analyses: Traceability of Standards, Operation and Maintenance of the General Chemistry Instrumentation, Low Level Mercury Sampling, Analysis of Alkalinity, Biomass, Carbon, $CBOD_5$, DO, Hardness, Biological Activity,

Ammonia, Nitrate, Nitrite, pH, Settleable Matter, TKN, Total Phosphorus, Total Solids, TSS, and VSS.

Off-Site Laboratory Quality Assurance Manual and Laboratory Procedures

7.4.2 Initial Analyst Data Reduction and Review

Prior to the analysis of samples, the analyst completes the logbooks associated with equipment and instrument conditions, and standard and sample preparations. All logbooks are periodically reviewed by either the Off-Site Group Leader or the On-Site Laboratory Manager to verify that they are kept up to date and that the procedures followed are consistent with standard operation procedures.

The analyst performing the test records all appropriate sample information, calibration data, sample results, and quality control sample results on the general chemistry laboratory bench sheets or organic analysis forms. The analyst checks to verify that all method and quality control criteria have been met, followed by completion of the associated review checklist. The data is then entered into the computerized database for report generation and proofed for correctness.

7.4.3 Final Data Review

All data undergo final review performed by either the Off-Site Group Leader or the On-Site Laboratory Manager. The reviewer ensures that all required forms are present, the calculations and reported data are correct, evaluates quality control data against QC acceptance limits, verifies method compliance, and that appropriate corrective action has been taken, if necessary. If errors exist, the reviewer will discuss and pursue resolution of the problem with the analyst.

7.4.4 Final Report Review

Both the On-Site Laboratory Manager and Facility Operations Manager perform a final review of the completed report containing the on-site data. The Off-Site Project Manager or Laboratory Manager, who is familiar with the site, conducts the final review of the off-site analytical data

package. The On-Site Laboratory Manager performs a final review of the completed report containing the off-site data. The final review consists of a comparison with historical data, a cross-check of client sample information, a transcription error check, and a final assessment that standardized data conventions have been employed. The On-Site Laboratory Manager generates a laboratory narrative. The narrative provides a written summary of the important aspects of the sample analysis and includes an evaluation of sample collection, transportation and receipt, sample analysis, quality control results, and any corrective action if taken.

7.5 PROCEDURAL BASIS AND METHOD REFERENCES

All off-site and on-site laboratory methods are based upon several of following documents:

- Appendix I Shell for Analytical Chemistry Requirements, EM 200-1-3, February 2001, USACE, Omaha, NE.

- Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 2, June 2002, Department of Navy, Lead service.

- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods; Third Edition and its updates; U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response, Washington, DC, 1992; EPA SW-846.

- Methods for Chemical Analysis of Water and Wastewater; U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH, 1983; EPA-600/7-1-93 Edition.

- Handbook for Analytical Quality Control in Water and Wastewater Laboratories; U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH, 1983; EPA-600/7-1-93 Edition.

- Standard Methods for the Examination of Water and Wastewater; 19th Edition; American Public Health Association, et al., Washington, DC, 1995.

- Competency Requirements for Calibration and Testing Laboratories: International Standards Organization, ISO/IEC Guide 25.

- USEPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review, February 1994. Office of Solid Waste and Emergency Response, Washington, DC, 1992.

- General Process and Operation Manual for the Groundwater Treatment System Ott/Story/Cordova Site, Muskegon, Michigan, 1995, Zimpro Environmental Inc.

8.0 RECORD KEEPING

8.1 INTRODUCTION

An efficient wastewater treatment system maintains operational, laboratory, and financial records. Record keeping is divided into four sections: Data Reporting, Reports, Operating Costs, and Documents, Forms, and Storage. Data reporting offers a guideline for presenting information in a consistent and cohesive format by establishing data requirements and reporting conventions. Four major reports are discussed: Daily Log Report, Monthly Operating Report, Groundwater Monitoring Report, and the Monitoring Well Static Water Levels Report.

All records produced and stored at this facility must be legible, accurate, complete, and archived in such a way that they may be easily retrieved or regenerated. All original hardcopy results are a combination of computer generated and handwritten information produced using indelible ink. All computer media records are stored on diskettes, labeled, and referenced to a hardcopy record which defines the operating system, programs, and file names.

8.2 DATA REPORTING

8.2.1 Minimum Data Reporting Requirements

Analytical and monitoring device data can be presented in a number of formats. Regardless of the format, a minimum amount of information (Table 8.1) is provided in the Groundwater Monitoring Report (GMR), Monthly Operating Report (MOR), and Daily Logs.

TABLE 8.1 DATA REPORTING

CHECK LIST	GMR	MOR, off site	MOR, on site	Daily
Report date	√	√	√	√
Sample identification	√	√	√	√
Process monitoring device identification.			√	√
Date of sample collection	√	√	√	√
Date of device reading			√	√
Date of sample prep. (if applicable)	√			
Date of sample analysis	√		√	
Analyte list	√	√	√	
Process monitoring parameter list			√	√
Analytical quantitation limits	√	√	√	
Units of measurement	√	√	√	√
Analytes detected	√	√	√	
Monitoring device readings			√	√
Report-specific data flags	√	√	√	
Regulatory limits (if applicable)		√	√	
Quality control results	√			

8.2.2 Reporting Conventions

Reporting conventions have been created to assure that analytical data and quality control results are presented in a consistent and correct fashion. Both the off-site and on-site laboratories use certain flags to qualify reported analytical data. Each report contains a flag definition page and/or footnotes that include one or more of the following:

- A dash (" - ") indicates the analysis was not performed on the sample date.

- An asterisk (" * ") indicates the result does not meet QC acceptance criteria and a discussion is provided in the narrative.

- U Flag – This flag is used when the analyte is not detected at or above the reported quantitation limit, with exception to the Discharge Monitoring Report (DMR). All analytical results below the reporting limit are entered on the DMR as zero. In addition, averages for all analytes are calculated using a value of zero for results of less than the reporting limit.

- D Flag – This flag indicates that the sample is diluted due to high levels of target or non-target analytes.

- Dilution Factor – When all positive results are followed by a "D" flag for a specific sample, it can usually be assumed that the detection limits are raised by a dilution factor for any analyte reported as undetected and flagged with "U". The Groundwater Monitoring Report includes a table of dilution factors for samples initially analyzed at a dilution. The Monthly Operating Report includes the following statement: "For all volatile results flagged with a "D", the reporting limits are raised by an unspecified dilution factor. All DAS semivolatile results were obtained from diluted samples and the listed reporting limits should be elevated by a factor of ten."

- E Flag – This flag is used when the analyte is detected at concentrations greater than the calibration range; value is estimated.

- B Flag – This flag is used when the analyte is present in the laboratory method blank at or above the reported quantitation limit.

- J Flag - This flag is used when the analyte is detectable but below the reporting limit and cannot be quantified; GC/MS data only.

The Ott/Story/Cordova facility is not staffed on weekends and holidays. The convention for reporting data for these days is as follows. Data obtained from continuous measurements (generally water and air flows) are recorded as the previously read measurement, unless a known shutdown or discontinuation of service occurred during the unstaffed period. Data obtained from totalizing or level measurements (generally total flows and chemical use) are calculated by averaging the values over the unstaffed period.

8.2.3 Report Authorization

Reports are authorized for release by individuals in the following positions:

- Operations Manager
- Laboratory Manager

8.3 REPORTS

Reports are produced in accordance with this facility's data requirements and reporting conventions, and site and permit specifications. Four major reports are generated at the Ott/Story/Cordova site: Daily Log Report, Monthly Operating Report, the Quarterly Groundwater Monitoring Report, and the Monitoring Well Static Water Levels Report.

8.3.1 Daily Log Report

A plant Daily Log is maintained to report current operating conditions and parameters. Selected information from the daily logs is compiled for presentation in the Monthly Operating Report. The Daily Log is reduced to a three page Access report presented in Figure 8.1. The daily logs are assembled and submitted to the United States Army Corp of Engineers (USACE) every two weeks.

The nine pages of the handwritten Daily Log contain the following information:

1. Blower Building and Return Sludge Building

    - Equipment hours of operation
    - Flow rates and totalized flows

2. Groundwater Treatment Building

    - Equipment hours of operation
    - Flow rates and totalized flows
    - Chemical feed rates and dosages

- Tank levels and valve positions

3. Sludge Treatment Building and Wells

- Equipment hours of operation
- Flow rates and totalized flows
- Chemical feed rates and dosages
- Tank levels

4. Blower Building, Sludge Pump House and TOU Building

- Operational Parameters

5. Plant Walk-Through Data

- Meter and tank readings
- Safety inspections
- Operational Parameters

6. Laboratory

- Samples Collected
- Microscopic examination data

7. Alarm, Shipments, and Safety Summaries

8. Air Monitoring Readings, Operator Hours, and Exclusion Zone Entry

9. Task Summary by Employee

FIGURE 8.1
OSC Superfund Site Daily Log

OTT/STORY/CORDOVA SUPERFUND SITE DAILY LOG

Date 05/01/04
Time 8:30 AM
Day Saturday

Extraction Wells

Well No.	EW Run Time (Hrs)	Totalizer (x 1000 gal)	Daily Flow (MGM)	Flow Rate (gpm)	EW Comment
1	0	0	0.000	0	
2	0	0	0.000	0	
3	0	0	0.000	0	
4	0	0	0.000	0	
5	0	0	0.000	0	
6a	0	0	0.000	0	
7	0	0	0.000	0	
8	0	0	0.000	0	
9	0	0	0.000	0	
10	0	0	0.000	0	
11	0	0	0.000	0	
				0	=Total Flow Rate (gpm)

Blower Building

BB Category	ASB-222	ASB-220	ASB-221	DF-132	DF130	DF-131	DB-122	DB-120	DB-121
Air Flow (cfm)	-	-	-	-	-	-	-	-	-
Motor Current Amps	-	-	-	-	-	-	-	-	-
Oil Pressure (psi)	-	-	-	-	-	-	-	-	-
Run Time (hrs)	-	-	-	-	-	-	-	-	-
System Pressure (psi)	-	-	-	-	-	-	-	-	-
Vibration (MLS)	-	-	-	-	-	-	-	-	-

Total Air Flow to PCTs (cfm)	?	Total Air Flow to DASs (CFM)	?
Total Daily Air Flow to PCTs (KCF)	?	Total Daily Air Flow to DASs (KCF)	?
Total Air Flow Rate to TOU (cfm)	?		
Total Air Flow to TOU (kcf)	?		

TOU Building

Burner 1 Temp (deg F):	?	Vacuum across RTC (in. H2O):	?
Burner 2 Temp (deg F):	?	pH (SU) - TOU:	?
Inlet Water Temp (deg F):	?	Scrubber Flow (gpm):	?
Outlet Water Temp (deg F):	?	Quench Flow (gpm):	?

FIGURE 8.1
OSC Superfund Site Daily Log

OTT/STORY/CORDOVA SUPERFUND SITE DAILY LOG

Date	05/01/04
Time	8:30 AM
Day	Saturday

DAS and PCT System

	PCT-201	PCT-202	DAS Basin
Digested Sludge to 701 (gals)	-	-	-
Organisms/ml	-	-	-
PID/FID Readings (ppm)	-	-	-
Supernatant (gals)	-	-	-

Groundwater Treatment Building

	TERTIARY FILTER		EFFLUENT SYSTEM			NPDES STATION
	FIT-515	FIT-524	FIT-551	FIT-552	FIT-553	FIT-561
Conductivity (uMhos)	-	-	-	-	-	-
Daily Flow (MGD)	-	-	-	-	-	-
Flow Rate (gpm)	-	-	-	-	-	-
pH (SU	-	-	-	-	-	-
Temperature (Deg F)	-	-	-	-	-	-

	West Inf	West Lead	West Lag	East Inf	East Lead	East Lag
Differential Pressure (psi)	-	-	-	-	-	-
VAC Pressure (psi)	-	-	-	-	-	-

Sludge Handling

	FIRST STAGE TREATMENT			SECOND STAGE TREATMENT		
	RSP-222	RSP-220	RSP-221	RSP-322	RSP-32	RSP-321
Daily Run Time (hrs)	-	-	-	-	-	-
PCT-201 RAS (gpm)	-	-	-	-	-	-
PCT-202 RAS (gpm)	-	-	-	-	-	-
Total Run Time (hrs)	-	-	-	-	-	-
VFD Setting (HZ)	-	-	-	-	-	-
Waste Sludge (lbs)	-	-	-	-	-	-
Waste Solids (%)	-	-	-	-	-	-
Waste Volume (gals)	-	-	-	-	-	-

Sludge Dewatering

	Run Time (hrs)	Loads (#)	Volume (CY)	Feed Solids (%)	Cake Solids (%)	Filtrate Solids (%)
FP-721	0	0	0	-	-	-
FP-722	0	0	0	-	-	-
FP-723	0	0	0	-	-	-

FIGURE 8.1
OSC Superfund Site Daily Log

OTT/STORY/CORDOVA SUPERFUND SITE DAILY LOG

Date 05/01/04
Time 8:30 AM
Day Saturday

Sump Pumps

	Run Time (hrs)	Pump Rate (gpm)	Volume (gals)
GTB 1	0	80	0
GTB 2	0	80	0
STB 1	0.0	140	0
STB 2	0.0	125	0

Utilities

BB Incoming Electric (MWH):	?
BB Switchboard Electric (MWH):	?
STB Electric (MWH):	?
GWTP Electric (MWH):	?
Natural Gas (CCF):	?

Chemicals Applied

	GPM	GALS	LBS	Concentration (ppm)
Carbon to PC-201			0	0
Carbon to PCT-202			0	0
Ferric Chloride	0.0000	0	0	0
Phosphoric Acid to PCT-201	0.0000	0	0	0
Phosphoric Acid to PCT-202	0.0000	0	0	0
Polymer to 301	0.0000	0	0	0
Polymer to 302	0.0000	0	0	0
TOU Caustic		0	0	0

Operators Hours

Operations:	0.0	Safety Program:	0.0
Preventative Maintenance:	0.0	Administration:	0.0
Corrective Maintenance:	0.0	Custodial:	0.0
Laboratory Work:	0.0	Oivertime:	0.0
Well Sampling:	0.0	Comp./Sick/Vacation Time Used:	0.0
Sludge Management:	0.0	Total Hours Worked:	0.0

8.3.2 Monthly Operating Report

Influent and effluent wastewater samples are collected daily or weekly during a given month at various locations throughout the plant for the purpose of NPDES permit compliance and to provide plant process information. The accumulated data is presented in a report containing five sections. Section two of the report includes the Discharge Monitoring Report (DMR) and the off-site analysis results. The DMR is signed by the Operations Manager or authorized agent. Section two of the Monthly Operating Report is mailed by the 10th day of the following month to:

MDEQ, Water Division
PCS/NMS Data Entry
P.O. Box 30273
Lansing, Michigan 48909-7773

The Monthly Operating Report is assembled and submitted by the 15th day of the following month to the United States Army Corp of Engineers (USACE) for distribution to all associated federal and state agencies and responsible parties. An example of a section of the Discharge Monitoring Report is present in Figure 8.2.

The five sections of the report contain the following information:

1. Introductory Information

- Abbreviations
- Operations Narrative
- Off-Site Laboratory Narrative
- On-Site Laboratory Narrative
- Footnotes
- Sample Collection Points
- Sampling Plan
- Process Flow Diagrams

2. Discharge Monitoring Report (DMR) and Off-Site Analytical Results.

3. On-Site Laboratory Results

- Extraction Well Flow Rates
- Inorganic Analysis Results
- Monitoring Device Readings
- Power Consumption
- Applied Chemicals
- Time Breakdown by Task

4. Plant Operation and Maintenance Summary

5. Materials Delivery Summary

Fig. 8.2 Discharge Monitoring Report

PERMITTEE NAME AND ADDRESS (Include Facility Name/Location if different)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004

NAME: MDEQ-ERD-OTT/STORY SF
Fishbeck, Thompson, Carr, and Huber

ADDRESS: 453 Agard Rd
North Muskegon, MI 49445

FACILITY: DEQ/Ott/Story Superfund Site

LOCATION: North Muskegon, MI 49445

ATTN: Karl Jaeger

MI0053309	001 A
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	2004	2	1	TO	2004	2	29

MINOR
(SUBR GG)
F- FINAL
001 GROUNDH20-N. Channel Muskegon

NOTE: Read instructions before completing this form.

PARAMETER		QUALITY OR LOADING AVERAGE	QUALITY OR LOADING MAXIMUM	QUALITY OR LOADING UNITS	QUALITY OR CONCENTRATION MINIMUM	QUALITY OR CONCENTRATION AVERAGE	QUALITY OR CONCENTRATION MAXIMUM	QUALITY OR CONCENTRATION UNITS	NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
PH	SAMPLE MEASUREMENT				7.5		7.6		0	1 x wk	G
00400 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT				6.5 DAILY MIN		9.0 DAILY MAX	12 SU		ONCE/GRAB MONTH	
TOTAL SUSPENDED SOLIDS	SAMPLE MEASUREMENT					0	5.0		0	4 x wk	24 HC
00530 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT					REPORT MO AVG	REPORT DAILY MAX	19 MG/L		THREE/COMP 24 WEEK	
NITROGEN, AMMONIA TOTAL AS N	SAMPLE MEASUREMENT					0	0		0	4 x wk	24 HC
00610 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT					REPORT MO AVG	REPORT DAILY MAX	19 MG/L		THREE/COMP 24 WEEK	
PHOSPHORUS, TOTAL AS P	SAMPLE MEASUREMENT	0.47		26		0.051			0	4 x wk	24 HC
00665 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT	7 MO AVG		LBS/DAY		0.5 MO AVG		19 MG/L		THREE/COMP 24 WEEK	
CYANIDE, FREE AMEN. TO CHLORINATION	SAMPLE MEASUREMENT						20		0	2 x mo	G
00722 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT						REPORT DAILY MAX	28 UG/L		TWICE/GRAB MONTH	
COPPER, TOTAL AS CU	SAMPLE MEASUREMENT						0 *		0	4 x yr	24 HC
01042 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT						REPORT DAILY MAX	28 UG/L		QUARTERLY	
CARBON TETRACHLORIDE	SAMPLE MEASUREMENT						0		0	1 x wk	G
32102 1 0 0 EFFLUENT GROSS VALUE	PERMIT REQUIREMENT						5 DAILY MAX	28 UG/L		TWICE/GRAB MONTH	

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE		DATE		
rl Jaeger	I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. 1001 AND 33 U.S.S 1319. (Penalties under those statutes may include fines up to $ 10,000 and or maximum imprisonment of between 6 months and 5 years.)		231 766-9227		2004	3	10
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA CODE	NUMBER	YEAR	MO	DAY

OMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

Quarterly reporting for this parameter was performed in January, 2004.

SCAN RESULTS MUST BE SUBMITTED WITH DMRS

8.3.3 Groundwater Monitoring Report

Up to eighty-four monitoring well and eleven extraction well groundwater samples are collected and analyzed quarterly, for organic analytes, to assess how the site remediation process is progressing. A follow-up report containing five sections is assembled and submitted (within 45 days from sample collection) to the United States Army Corp of Engineers for distribution to all associated federal and state agencies and responsible parties. An electronic diskette deliverable is E-mailed to Black and Veatch by the on-site Laboratory Manager. Examples of a Volatile Data Reporting Form, Chain-of-Custody, and Groundwater Sampling Field Data Form are presented in Figures 8.3, 8.4, and 8.5 respectively.

The five sections of the report contain the following information:

1. Case narrative

    - Sampling Event Summary
    - Sample Handling and chain-of-Custodies
    - Sample Analysis
    - Quality Control Summary

2. Volatile and Semivolatile Results

    - Samples
    - Duplicates
    - Trip Blanks
    - Method Blanks
    - MSs, MSDs, LCSs

3. Sample Log-In Sheets

4. Chain-of-Custodies

5. Field Data Reports

Fig. 8.3 Volatile Data Reporting Form

E 1

OTT/STORY/CORDOVA SUPERF[illegible]TE NORTH MUSKEGON, MICHIGAN

SEPTEMBER, 2003

MONITORING WELLS-VOLATILES

Date Sampled: / Date Analyzed:	DETECTION LIMITS	09/26/03 10/03/03 W-26s-0903	09/26/03 09/30/03 W-26d-0903	09/26/03 09/30/03 W-7s-0903	09/26/03 10/02/03 W-7d-0903	09/29/03 10/02/03 K-28d-0903	09/29/03 10/02/03 W-17d-0903	09/29/03 10/02/03 W-17s-0903	09/29/03 10/06/03 UW-1-0903	09/29/03 10/03/03 W-18s-0903	09/29/03 10/03/03 W-101d-0903	09/29/03 10/06/03 W-101i-0903	09/29/03 10/03/03 W-101s-0903
Dichlorodifluoromethane	1.0	U	U	U	U	U	U	U	U	U	U	U	U
Chloromethane	5.0	U	U	U	U	U	U	U	U	U	U	U	U
Vinyl Chloride	1.0	U	100 D	U	130 D	28	20	U	60	U	110 D	36 D	U
Bromomethane	5.0	U	U	U	U	U	U	U	U	U	U	U	U
Chloroethane	1.0	U	U	U	U	U	U	U	U	320 D	U	73 D	U
Trichlorofluoromethane	1.0	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethene	1.0	U	17 D	U	43	6.2	5.6	U	17	U	U	21 D	U
Acetone	10	U	U	U	U	U	U	U	U	U	U	370 D	U
Carbon Disulfide	5.0	U	U	U	U	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	1.0	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethane	1.0	U	25 D	U	26	8.8	7.0	U	15	150 D	U	1100 D	53 D
cis-1,2-Dichloroethene	1.0	U	16 D	U	1.4	U	U	U	1.3	80 D	400 D	U	100 D
Chloroform	1.0	U	U	U	U	U	U	U	U	260 D	U	6.7 D	1200 D
Tetrahydrofuran	5.0	U	U	U	6.9	U	5.5	U	11	U	U	160 D	U
1,1,1-Trichloroethane	1.0	U	U	U	U	U	U	U	U	400 D	U	310 D	730 D
Carbon Tetrachloride	1.0	U	U	U	U	U	U	U	U	U	U	U	U
1,2-Dichloroethane	1.0	U	760 D	U	1300 D	200 D	540 D	U	680 D	U	U	17 D	U
Benzene	1.0	U	28 D	U	41	21	9.1	U	37	34 D	U	160 D	330 D
Trichloroethene	1.0	U	37 D	U	5.3	U	U	U	26	U	880 D	U	350 D
1,2-Dichloropropane	1.0	U	U	U	U	U	U	U	U	U	U	U	U
Bromodichloromethane	1.0	U	U	U	U	U	U	U	U	U	U	U	U
cis-1,3-Dichloropropene	1.0	U	U	U	U	U	U	U	U	U	U	U	U
Toluene	1.0	U	310 D	U	440 D	4.5	U	U	100 D	140000 D	73 D *	160 D	5300 D
s-1,3-Dichloropropene	1.0	U	U	U	U	U	U	U	U	U	U	U	U
2-Trichloroethane	1.0	U	U	U	U	U	U	U	U	25 D	U	17 D	U
achloroethene	1.0	U	7.9 D	U	4.9	1.1	U	U	220 D	66 D	37000 D	U	55000 D
romochloromethane	1.0	U	U	U	U	U	U	U	U	U	U	U	U
Chlorobenzene	1.0	U	16 D	U	27	U	U	310 D	14	67 D	U	U	48 D

Rev. 04/26/04

8.13

Samples Collected and Analyzed by: Fishbeck, Thompson, Carr, and Huber
Additional QA/QC filed on site

all units in ug/l

Fig. 8.5 Volatile Data Reporting Form (cont'd)

OTT/STORY/CORDOVA SUPERF[illegible]E NORTH MUSKEGON, MICHIGAN
SEPTEMBER, 2003
MONITORING WELLS-VOLATILES

Date Sampled:		09/26/03	09/26/03	09/26/03	09/26/03	09/29/03	09/29/03	09/29/03	09/29/03	09/29/03	09/29/03	09/29/03	09/29/03
Date Analyzed:	DETECTION LIMITS	10/03/03	09/30/03	09/30/03	10/02/03	10/02/03	10/02/03	10/02/03	10/06/03	10/03/03	10/03/03	10/06/03	10/03/03
		W-26s-0903	W-26d-0903	W-7s-0903	W-7d-0903	K-28d-0903	W-17d-0903	W-17s-0903	UW-1-0903	W-18s-0903	W-101d-0903	W-101i-0903	W-101s-0903
Ethylbenzene	1.0	U	U	U	1.5	U	U	3.9	4.4	56 D	U	U	610 D
Xylenes (total)	3.0	U	U	U	U	U	U	U	20	200 D	U	U	4300 D
Styrene	1.0	U	U	U	U	U	U	U	U	U	U	U	U
Bromoform	1.0	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	1.0	U	U	U	U	U	U	U	U	U	U	U	U
1,3-Dichlorobenzene	2.0	U	U	U	U	U	12	25	9.5	U	U	U	68 D
1,4-Dichlorobenzene	2.0	U	U	U	12	U	66	130 D	96 D	U	110 D	U	1100 D
1,2-Dichlorobenzene	2.0	U	U	U	82	3.9	330 D	1100 D	820 D	88 D	4300 D	U	11000 D

D=Quantified from a dilution,
*See Narrative

Surrogates	Spike	Percent Recoveries											
1,2-Dichloroethane-d4	50	98	101	102	100	98	99	100	97	96	97	99	98
Toluene-d8	50	97	96	93	99	97	97	98	98	98	98	97	97
4-Bromofluorobenzene	50	101	101	101	101	99	101	100	100	98	100	99	101
1,2-Dichlorobenzene-d4	50	91	92	90	108	93	151 *	230 *	220 *	93	129 *	91	164 *

Rev. 04/26/04

Samples Collected and Analyzed by: Fishbeck, Thompson, Carr, and Huber
Additional QA/QC filed on site

all units in ug/l

TRACE
Assurance
Accuracy
Accountability

phone 231.773.5998
toll-free 800.733.5998
fax 231.773.6537

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-26
www.trace-labs.com

CHAIN-OF-CUSTODY RECORD AND WORK AUTHORIZATION

Fig. 8.4 Chain-of-Custody

TR[illegible]D NO.

Page 1 of 1

Report Results To:

Client Name: FTC & H
Contact Person: Cathy Jaeger
Mailing Address: 453 Agard Rd
City, State, Zip Code: Muskegon MI 49441
Phone: (231) 766-9227 Fax: (231) 766-9247
Email Address:
Project Name: Ott/Story PO #: Trace Quote #:
Project #: Sampled by: LC/SV

For Use by TRACE Personnel Only

Logged By: Checked By:
Received on ice: Yes No Cooler Temp (°C)
Preservative Checked: Yes No
Volatiles Preserved: HCl MeOH En Core No Low Level

Regulatory Requirements
- MERA TMDL's ☐
- RCRA ☒
- NPDES ☐
- USACE ☐
- Special ☐

Turnaround Requirements
- Standard (2 wk) ☒
- * 5 Day ☐
- * 2-4 Day (RUSH) ☐
- * 24 Hour (RUSH) ☐
- * Requires prior approval

Matrix Key
- S = Soil
- W = Water
- SE = Sediment
- OI = Oil
- SO = Solid Waste
- WI = Wipes
- L = Liquid Waste
- A = Air
- D = Drinking Water

ANALYSIS REQUESTED

SAMPLE NO.	DATE TAKEN	TIME TAKEN	METALS FIELD FILTERED	CLIENT SAMPLE ID	MATRIX	NUMBER OF CONTAINERS	8260	8270								REMARKS	Possible Health Hazard
	03/06/03	10:00a	N/A	K-4sR-0303	W	5	3	2									
		11:35a	N/A	mw-38i-0303		13	7	6								ms/msD	
		1:45p		W-6d-0303		5	3	2									
		2:40p		W-13d-0303		5	3	2									
				Dup-1-0303		5	3	2									
				Trip Blank 03/06/03		5	2										

Item #	RELEASED BY	RECEIVED BY	DATE	TIME	Item #	RELEASED BY	RECEIVED BY	DATE	TIME
	1) [signature]	[signature]	03/07/03	9:00a		3)			
	2)					4)			

Sample Identification / Request for Analytical Services

Rev. 04/26/04

Please Sign

ecuting this agreement, the client acknowledges acceptance of the terms of the agreement as listed on the reverse side.

Fig. 8.5 Groundwater Sampling Field Data Form

Groundwater Sampling
Field Data Form

Project name: Ott Story Cordova
Sampling point: EW-5-0303
Sampled by: KC/SX

Date: 3-10-03
Time: 10:49 AM
Weather: Snow

Top of casing elevation:	634.9	feet
Depth to static water level:	Not applicable	feet
Depth to well bottom:	89.6	feet
Height of water column, H:	Not applicable	feet
Diameter of well casing, D: (approx. diameter)	8	inches
Volume of water column:	Not applicable	gallons
Volume of water evacuated:	5	gallons

Depth to static water level after purging: NA
Did well recover? YES NO

Method of evacuation: Sample Port Purge Flow Rate: NA gpm

Method of sampling: Sample Port

Readings:

	1	2	3	4	5	
Sample temperature:	9.5					°C
Sample pH:	7.21					S.U.
Sample DO:	4.35					mg/L
Sample specific conductance:	699					Microseimens per centimeter

Sample color: LT. AMBER

Sample turbidity: HIGH / MODERATE / (LOW)

Sample odor: (YES) NO PID reading: N/A

Other observations: NA Comments: NA

Additional comments on methodology, etc.: DUPLICATE #3

Signature: [signature]

Rev. 04/26/04

8.16

EW-5-0303.xls

8.3.4 Monitoring Well Static Water Levels Report

Every month, water level measurements are obtained from a list of monitoring wells selected by the United States Army Corp of Engineers (USACE). These measurements are recorded on a table titled "Static Water Levels" provided as Figure 8.6 and submitted to the United States Army Corp of Engineers (USACE). The Top-of-Casing (TOC) is a known reference elevation. The water elevation is the difference between the TOC and the measured distance from the TOC to the water surface. The engineering firm responsible for monitoring remediation progress uses this data to track capture of the contaminant plume.

8.4 OPERATING COSTS

The Operations Contractor maintains detailed records of all operating costs, including information on unit costs, total costs, and amounts or quantities used. The major categories of operating costs are:

- Salaries, wages, and benefits,
- Employee training,
- Insurance,
- Safety expenditures and first aid supplies,
- Office supplies,
- Laboratory supplies,
- Sludge and garbage disposal,
- Utilities-includes electricity, natural gas, water, and telephone,
- Fuels-includes oil, propane, and gasoline,
- Chemicals-includes sodium hydroxide, ferric chloride, polymer, phosphoric acid, powdered, and granulated activated carbon, and lime,
- Maintenance-includes maintenance contracts, spare parts, service calls, special tools, and cleaning equipment and supplies,
- Shipment and deliveries.

Fig. 8.6 Static Water Levels

Ott/S[illegible] Cordova

STATIC WATER LEVELS

November, December 2003, March 2004

Number	Type	Well Id	TOC	11/3/03	Elevation	12/1/03	Elevation	3/3/03	Elevation		Elevation
1	M	w101s	**650.08**	14.08	636.00	12.80	637.28	12.34	637.74		650.08
2	M	w101i	**650.25**	13.56	636.69	12.23	638.02	11.74	638.51		650.25
3	M	w101d	**649.68**	11.69	637.99	10.34	639.34	9.85	639.83		649.68
4	M	w102s	**646.80**	17.50	629.30	15.59	631.21	16.11	630.69		646.80
5	M	w102i	**647.04**	13.98	633.06	12.77	634.27	12.23	634.81		647.04
6	M	w102d	**645.63**	11.09	634.54	9.78	635.85	9.25	636.38		645.63
7	M	ow9d	**644.64**	11.81	632.83	10.60	634.04	10.01	634.63		644.64
8	M	w124d	**644.38**	11.22	633.16	9.93	634.45	9.28	635.10		644.38
9	M	w124s	**644.06**	14.98	629.08	14.06	630.00	13.63	630.43		644.06
10	M	mw34s	**629.99**	21.38	608.61	21.16	608.83	21.11	608.88		629.99
11	M	mw34i	**630.30**	20.20	610.10	20.03	610.27	19.78	610.52		630.30
12	M	mw34d	**630.48**	8.01	622.47	7.26	623.22	6.80	623.68		630.48
13	M	mw16s	**626.53**	17.33	609.20	17.21	609.32	17.06	609.47		626.53
14	M	ow16i	**626.84**	15.67	611.17	16.43	610.41	16.17	610.67		626.84
15	M	mw16d	**626.33**	5.75	620.58	4.93	621.40	4.53	621.80		626.33
16	P	w111s	**638.43**	29.65	608.78	29.16	609.27	28.95	609.48		638.43
17	P	w111i	**638.35**	31.62	606.73	31.20	607.15	30.60	607.75		638.35
18	P	w108s	**639.94**	31.34	608.60	30.80	609.14	30.50	609.44		639.94
19	P	w108i	**639.98**	33.26	606.72	32.87	607.11	32.33	607.65		639.98
20	P	w109s	**638.14**	29.70	608.44	29.09	609.05	28.91	609.23		638.14
21	P	w109i	**638.17**	31.04	607.13	30.66	607.51	30.19	607.98		638.17
22	M	w110s	**637.98**	29.93	608.05	29.17	608.81	29.03	608.95		637.98
23	M	w110i	**636.08**	30.22	605.86	29.84	606.24	29.35	606.73		636.08
24	P	w112s	**638.32**	29.10	609.22	28.54	609.78	28.51	609.81		638.32
25	P	w112i	**638.11**	28.48	609.63	28.69	609.42	28.05	610.06		638.11
26	P	w113s	**637.72**	28.87	608.85	28.47	609.25	28.35	609.37		637.72

Fig. 8.6 Static Water Levels (Cont'd)

Ott/S Cordova

STATIC WATER LEVELS

November, December 2003, March 2004

Number	Type	Well Id	TOC	11/3/03	Elevation	12/1/03	Elevation	3/3/03	Elevation		Elevation
27	P	w113i	**637.68**	29.70	607.98	29.58	608.10	28.50	609.18		637.68
28	M	w114s	**637.02**	28.29	608.73	27.83	609.19	27.72	609.30		637.02
29	M	w114i	**636.92**	29.67	607.25	29.21	607.71	28.50	608.42		636.92
30	M	w116s	**635.60**	27.11	608.49	26.24	609.36	26.21	609.39		635.60
31	M	w116i	**635.30**	26.88	608.42	26.42	608.88	25.97	609.33		635.30
32	P	w115s	**639.37**	30.97	608.40	30.77	608.60	30.75	608.62		639.37
33	P	w115i	**639.37**	33.03	606.34	32.22	607.15	31.34	608.03		639.37
34	M	mw23s	**641.90**	32.23	609.67	32.05	609.85	31.84	610.06		641.90
35	M	ow23s	**640.91**	33.11	607.80	32.90	608.01	32.83	608.08		640.91
36	M	mw23d	**641.45**	15.42	626.03	14.50	626.95	14.06	627.39		641.45
37	M	w107s	**641.96**	31.34	610.62	31.20	610.76	31.00	610.96		641.96
38	M	w107i	**641.67**	29.91	611.76	29.65	612.02	29.31	612.36		641.67
39	M	w106s	**642.64**	29.48	613.16	29.23	613.41	28.88	613.76		642.64
40	M	w106i	**642.04**	27.82	614.22	27.51	614.53	27.04	615.00		642.04
41	M	w105s	**642.88**	27.02	615.86	26.72	616.16	26.20	616.68		642.88
42	M	w105i	**642.57**	26.46	616.11	26.11	616.46	25.58	616.99		642.57
43	M	w104s	**642.83**	24.92	617.91	24.52	618.31	23.97	618.86		642.83
44	M	w104i	**642.50**	24.68	617.82	24.27	618.23	23.72	618.78		642.50
45	M	mw12s	**644.50**	30.30	614.20	29.98	614.52	29.52	614.98		644.50
46	M	ow12s	**644.98**	30.79	614.19	30.52	614.46	30.05	614.93		644.98
47	M	mw12d	**644.22**	14.08	630.14	13.01	631.21	12.62	631.60		644.22
48	P	ow8	**644.71**	33.93	610.78	33.36	611.35	32.92	611.79		644.71
49	P	b1 (k1d)	**646.74**	32.66	614.08	32.00	614.74	31.34	615.40		646.74
50	P	w118s	**640.86**	31.70	609.16	31.48	609.38	31.15	609.71		640.86
51	P	w118i	**640.91**	32.52	608.39	31.86	609.05	31.00	609.91		640.91
52	M	w117s	**641.04**	31.68	609.36	31.43	609.61	30.91	610.13		641.04

Fig. 8.6 Static Water Levels (Cont'd)

Ott/S[illegible] Cordova

STATIC WATER LEVELS

November, December 2003, March 2004

Number	Type	Well Id	TOC	11/3/03	Elevation	12/1/03	Elevation	3/3/03	Elevation		Elevation
53	M	w117i	**641.03**	33.55	607.48	32.93	608.10	32.50	608.53		641.03
54	P	w119s	**642.71**	29.40	613.31	29.24	613.47	28.40	614.31		642.71
55	P	w119i	**642.63**	31.00	611.63	30.43	612.20	29.83	612.80		642.63
56	M	w120s	**642.18**	30.52	611.66	30.23	611.95	29.39	612.79		642.18
57	M	w120i	**642.32**	32.85	609.47	32.21	610.11	31.66	610.66		642.32
58	M	w121s	**643.28**	27.15	616.13	26.85	616.43	25.98	617.30		643.28
59	M	w121i	**643.31**	28.46	614.85	27.68	615.63	27.10	616.21		643.31
60	M	w122s	**642.48**	23.91	618.57	23.30	619.18	22.61	619.87		642.48
61	M	w122i	**642.53**	24.94	617.59	24.13	618.40	23.63	618.90		642.53
62	M	ow3	**641.40**	15.30	626.10	14.24	627.16	13.90	627.50		641.40
63	M	w123s	**641.68**	15.58	626.10	14.44	627.24	14.08	627.60		641.68
64	M	w123d	**641.34**	13.00	628.34	12.03	629.31	11.50	629.84		641.34
65	M	w103s	**646.97**	14.22	632.75	13.13	633.84	12.67	634.30		646.97
66	M	w103i	**646.30**	12.33	633.97	11.08	635.22	10.54	635.76		646.30
67	P	w125s	**646.13**	15.61	630.52	14.67	631.46	14.30	631.83		646.13
68	P	w125i	**645.98**	14.73	631.25	13.51	632.47	12.89	633.09		645.98
69	P	w125d	**646.11**	13.10	633.01	11.85	634.26	11.24	634.87		646.11
70	M	k4sR	**642.26**	18.08	624.18	17.20	625.06	16.45	625.81		642.26
71	M	k5dR	**641.99**	18.52	623.47	17.55	624.44	17.00	624.99		641.99
72	M	k32s	**643.55**	14.04	629.51	12.75	630.80	12.37	631.18		643.55
73	M	K31D	**644.64**	15.04	629.60	13.90	630.74	13.51	631.13		644.64
74	M	k12s	**641.49**	21.05	620.44	20.05	621.44	18.31	623.18		641.49
75	M	k13d	**641.24**	23.21	618.03	22.51	618.73	21.17	620.07		641.24
76	RW	RW1	**636.14**	25.90	610.24	25.46	610.68	24.98	611.16		636.14
77	EW-1	Sounding T.	**635.82**	26.01	609.81	25.67	610.15	25.28	610.54		635.82
78	RW	RW2	**637.30**	32.79	604.51	32.49	604.81	30.54	606.76		637.30

Fig. 8.6 Static Water Levels (Cont'd)

Ott/S[illegible] Cordova

STATIC WATER LEVELS

November, December 2003, March 2004

Number	Type	Well Id	TOC	11/3/03	Elevation	12/1/03	Elevation	3/3/03	Elevation		Elevation
79	EW-2	Sounding T.	**637.20**	43.46	593.74	41.77	595.43	41.68	595.52		637.20
80	RW	RW3	**634.65**	35.80	598.85	36.38	598.27	31.90	602.75		634.65
81	EW-3	Sounding T.	**634.44**	41.82	592.62	41.96	592.48	41.62	592.82		634.44
82	RW	RW4	**632.71**	33.00	599.71	30.98	601.73	28.85	603.86		632.71
83	EW-4	Sounding T.	**632.34**	46.72	585.62	46.07	586.27	47.02	585.32		632.34
84	RW	RW5	**635.13**	37.57	597.56	38.37	596.76	40.95	594.18		635.13
85	EW-5	Sounding T.	**634.90**	55.20	579.70	53.54	581.36	51.28	583.62		634.90
86	EW-6	West Rehab.	**641.32**	35.88	605.44	35.26	606.06	34.71	606.61		641.32
87	EW-6a	Sounding T.	**641.23**	76.40	564.83	72.01	569.22	76.03	565.20		641.23
88	RW	RW7	**638.29**	41.59	596.70	40.57	597.72	39.73	598.56		638.29
89	EW-7	Sounding T.	**637.80**	42.51	595.29	41.44	596.36	40.51	597.29		637.80
90	RW	RW8	**642.61**	16.28	626.33	14.30	628.31	13.35	629.26		642.61
91	EW-8	Sounding T.	**642.62**	45.18	597.44	39.52	603.10	33.14	609.48		642.62
92	RW	RW9	**642.68**	12.53	630.15	10.53	632.15	9.83	632.85		642.68
93	EW-9	Sounding T.	**642.62**	12.94	629.68	11.36	631.26	10.68	631.94		642.62
94	EW-9	N.W. Satellite	**647.76**	13.51	634.25	11.98	635.78	11.30	636.46		647.76
95	EW-10	Sounding T.	**649.98**	21.30	628.68	21.93	628.05	22.60	627.38		649.98
96	EW-11	Sounding T.	**646.88**	19.15	627.73	17.93	628.95	17.69	629.19		646.88
97	P	w126s	**647.36**	12.13	635.23	10.90	636.46	10.52	636.84		647.36
98	P	w126i	**646.93**	12.16	634.77	10.91	636.02	10.50	636.43		646.93
99	P	w127s	**647.41**	12.15	635.26	10.92	636.49	10.54	636.87		647.41
100	P	w127i	**647.42**	12.26	635.16	11.02	636.40	10.58	636.84		647.42
101	M	TW-F	**643.23**	8.61	634.62	7.50	635.73	7.20	636.03		643.23
102	M	W17s	**650.70**	16.78	633.92	15.59	635.11	15.30	635.40		650.70
103	M	W17d	**650.66**	16.67	633.99	15.46	635.20	15.11	635.55		650.66
104	M	UW1	**648.30**	15.42	632.88	14.15	634.15	13.57	634.73		648.30

8.5 REPORTING FORMS AND LOG BOOKS

8.5.1 Work Orders

Routine preventative maintenance procedures have been incorporated into the Maintain-It software program. Work orders are printed out weekly, assigned by the Facility Supervisor, and filed once the listed task has been completed. The form contains the following information: work order, task, equipment and parts number and task instructions. The Labor and Comment sections of the form are completed by the Operator. An example of a Work Order is provided in Figure 8.7.

8.5.2 Laboratory Bench Sheets

On-Site laboratory bench sheets provide a consistent and systematic guide for performing routine laboratory analyses. In addition, the sheets offer a convenient place to record and compute data, and supply a record of results for future reference. A copy of a bench sheet is provided in Figure 8.8.

8.5.3 Visitor Sign-In Log

All visitors must "sign in" before entering the facility. The sign in book is located just inside the main building entrance. The form includes a place for the visitor's name, company, date, in and out time, and agreement to adhere to safety procedures.

8.5.4 Daily Logs

Daily logs are maintained to report current operating conditions and parameters. The log book is a three-ring binder subdivided into 31 sections for the days of the month. At the end of each month and after the Monthly Operating Report is assembled, the log contents are transferred to the appropriate filing cabinet for permanent storage.

8.5.5 Diskette Logs

Most generated written records are transferred to diskette for long term storage. Log books are maintained to document the contents and location of all laboratory and operations diskettes.

8.5.6 Laboratory Log Books

8.5.6.1 Standard Preparation Log Books

The General Chemistry Standards Logbook (GCSL) is maintained in order to reference stock and working calibration and quality control standards and to track the receipt of all source standards and reagents. The Organic Standards Logbook (OSL) is maintained in order to reference each calibration mixture, internal standard, matrix spike, tune, or surrogate compound which is diluted from a certified stock solution.

An entry is made in a log book each time a new source standard or reagent is received or standards are prepared. The date and name of the analyst preparing the standard will be recorded with each entry. The standard or reagent is given an ID code which is logged in the book and on the container. If a solution is being prepared, the following information is entered:

- brief description or name of compound,
- expiration date,
- initial and final concentrations and volumes,
- solvent used for dilution,
- manufacturer and lot number (certified standards).

8.5.6.2 Instrument Maintenance Log Book

A log book is used for documenting instrument maintenance and repairs. Each entry into the log book must include a description of the problem or the reason for performing the maintenance, the corrective action, repair, or maintenance performed, and the date and analyst initials.

8.5.6.3 Support Equipment Logs

A notebook is maintained in the laboratory that contains the temperature logs for the ovens, refrigerators, freezers, and incubator, a thermometer and Eppendorf pipette calibration record, and the water blank analysis log for the water purification system. This notebook also includes the balance calibration log which records the measured mass of each Class 1 weight. An entry is made in the logs on a daily basis.

8.5.6.4 Organic Sample Extraction Log Book

A log book is used to record each batch of samples extracted. All information must be recorded for each sample extracted. The sheet includes relevant sample information (ie., Sample ID and Date), batch identification, initial and final sample volumes, quality control standard IDs and concentrations, and the date and analysts initials.

HARGE PUMP (EFFLUENT)

Task No.	DP-540	**Request Date**	3/ 9/04
Tenant		**Request Time**	13:24:25
Assigned By	JES	**Originator**	
Assigned To		**Telephone No.**	
Scheduled Start Date	3/ 9/04 13:24:25	**Extension**	
Scheduled Finish Date	3/ 9/04	**WO Type**	PM
Perform by Warranty	No	**Completion Date**	
Priority		**Completion Time**	
Expense Class			

Craft	Crew Size	Estimated Labor Hours

Equipment No.	Equipment Description	Location	Sub-location 1	Sub-location 2	Sub-location 3
DP-540	DISCHARGE PUMP (EFFLUENT)	GROUND TREATMENT BUILDING	-	-	-

Item No.	Equipment No.	Description	Qty Required	Date Used	Qty Used
HD-68	DP-540	TEXACO RANDO HD68		3/16/04	

List extra parts and comments here

Employee Code	Equipment No.	Work Date	First Name	Last Name	Regular Hours	Overtime Hours

Safety Notes

Equipment No. DP-540

MOTOR/5K324BS205D20 SER. NO. VK6344216
VALVE/SER. NO.FOO 3998/-60967-02

Task Instructions

FEFER TO FILE DP PUMPS: MONTHLY; ALTERNATE PUMP RUNNING, Also check and tighten packing gland as needed to stop leakage. Remember, some water leakage is needed to keep packing lubercated. QUARTERLY: Change pump oil every 4000 hours or Quarterly, using Texaco Rando HD68. Grease motor every 4000 Hours. Be sure to remove the fill plug when adding grease.

Fig. 8.8 Laboratory Bench Sheet

pH

Method 150.1

Sample	Freq	No	pH	Dup pH	Reported pH	QC	Windows
DAS Influent	5 D	1					≤ 0.1 s.u.
[illegible]01 Inf	5 D	2					≤ 0.1 s.u.
[illegible]202 Inf	5 D	3					≤ 0.1 s.u.
PCT-201-1st	5 D	4					≤ 0.1 s.u.
PCT-202-1st	5 D	5					≤ 0.1 s.u.
PCT-201-2nd	2 D	6					≤ 0.1 s.u.
PCT-202-2nd	2 D	7					≤ 0.1 s.u.
PCT-201 Eff	5 D	25					≤ 0.1 s.u.
PCT-202 Eff	5 D	26					≤ 0.1 s.u.
C-301 effluent	5 D	8					≤ 0.1 s.u.
C-302 effluent	5 D	9					≤ 0.1 s.u.
NPDES Station, **Grab**	5 D	14					≤ 0.1 s.u.
NPDES Station, Field Dup	5 Y	14 fd					≤ 0.1 s.u.
Outfall	W	24					≤ 0.1 s.u.
Outfall, Field Dup	5 Y	24 fd					≤ 0.1 s.u.
CVS	2 D	CVS					≤ 0.1 s.u.
Slope		Std 7=					

Time of Collection : 8:30am
Samplers: LC/JS/DL
Analyst:
Samples Collected: 1, 2,3,4,5,6,
7, 8, 9, 10,11,14,25,26,31,32,33,34

Cal. Stand. ID: _____

Date of Anal. _____
Time of Anal. _____

CVS Stand. ID: _____

Outfall
Time of Coll. _____
Time of Anal. _____

DISSOLVED OXYGEN

Method 360.1

Sample	Freq	No	DO(i) mg/l	DO(20') mg/l	Reported DO(i) mg/l	°C(i)	°C(20')	Reported Temp °F(i)	OUR
DAS Influent	5 D	1							NA
DAS Influent, Field Dup	5 Y	1 fd							
[illegible]01-1st	5 D	4							NA
[illegible]02-1st	5 D	5							NA
PCT-201-2nd	2 D	6							NA
PCT-202-2nd	2 D	7							N/A
NPDES Station, **Grab**	5 D	14							N/A
NPDES Station, Field Dup	5 Y	14d							N/A
Outfall	W	24							N/A
Outfall, Field Dup	5 Y	24 fd							N/A
Slope (0.7-1.2)									

Date of Anal. _____
Time of Anal. _____

Outfall
Time of Coll. _____
Time of Anal. _____

SETTLEABLE MATTER

Method 160.5

Sample	Freq	No	Initial	Final	Start	Stop	Reported % Sett.	Dup % RPD
PCT-201-1st	5 D	4						N/A
PCT-201-2nd	0	6	N/A	N/A	N/A	N/A	N/A	N/A
PCT-202-1st	5 D	5						N/A
PCT-202-2nd	0	7	N/A	N/A	N/A	N/A	N/A	N/A
Duplicate RPD<20%	M	5 d						

Date of Anal. _____
Time of Anal. _____

MICROORGANISM

Sample	Freq	No	Flag.	Free / Crawling	Stalk	Nmtds	Rtfrs
PCT-201-1st	5 D	4					
PCT-201-2nd	5 D	6	N/A	N/A	N/A	N/A	N/A
PCT-202-1st	5 D	5					
PCT-202-2nd	5 D	7	N/A	N/A	N/A	N/A	N/A
[illegible] Transects:	4						
[illegible]ication:	10						

Date of Anal. _____
Time of Anal. _____

Fig. 8.8 Laboratory Bench Sheet (Cont'd)

AMMONIA NITROGEN

Method 350.3

Sample	Freq	No	Dil	Conc mg/l	Reported Conc mg/l	QC	Windows
[illegible]d Blank	5 D	B					≤ 0.1
[illegible]1.0 ppm	5 D	ICV					80-120%
NPDES Station, **Comp**	4 D	14					N/A
NPDES Station, Field Dup	5 Y	14 fd					
C-302 effluent	5 D	9					N/A
C-301 effluent	5 D	8					N/A
PCT-202 Eff	5 D	26					N/A
PCT-201 Eff	5 D	25					N/A
PCT-202 Influent	5 D	3					N/A
PCT-201 Influent	5 D	2					N/A
DAS Influent	5 D	1					N/A
DAS Influent, Field Dup	5 Y	1 fd					
DAS Influent, Duplicate	2 D	1d					RPD≤ 20%
DAS Influent 1.0 ppm	2 D	1ms					80-120%
Check Stand	2 D	CVS					
CCV, LCS 1.0 ppm	5 D	CCV					80-120%
LCD, 1.0 ppm	2 D	LCD					80-120%
CCB	5 D	CCB					≤ 0.1
Slope (-54 to -61 mV)							

MS= $\frac{\text{MS- (Sample*.9)}}{1.0}$ *100

LCS,ICV= $\frac{\text{Recovery}}{1.0}$ * 100

Dup.= $\frac{\text{Sample -Dup}}{\text{Average}}$ *100

Cal. Stand. ID: _____

CVS Stand. ID: _____

Date of Anal. _____

Time of Anal. _____

Comments

CHEMICAL OXYGEN DEMAND

Method 410.4

Sample	Freq	No	Range	Dil	Conc mg/l	DxConc	Reported Conc mg/l	QC	Windows
Method Blank	5 D	B	20-150						≤ 20
ICV 80ppm	5 D	ICV	20-150						80-120%
DAS Influent	5 D	1	20-150						N/A
DAS Influent, Field Dup	5 Y	1 fd	20-150						N/A
PCT-201 Influent	5 D	2	20-150						N/A
PCT-202 Influent	5 D	3	20-150						N/A
PCT-201 Eff	5 D	25	20-150						N/A
PCT-202 Eff	5 D	26	20-150						N/A
C-301 effluent	5 D	8	20-150						N/A
C-302 effluent	5 D	9	20-150						N/A
NPDES Station, **Grab**	5 D	14	20-150						N/A
NPDES Station, **Grab, fd**	5 Y	14 fd	20-150						N/A
Duplicate	2 D	26 d	20-150						(+/- 20)
Matrix Spike, 75ppm	2 D	26 ms	20-150						80-130%
LCS, 75ppm	2 D	LCS	20-150						80-120%
LCD, 75 ppm	2 D	LCD	20-150						80-120%
Check Std	1 W	CVS	20-150						
CCV, 80ppm	5 D	CCV	20-150						80-120%
CCB	5 D	CCB	20-150						≤ 20

MS = $\frac{\text{(ms- (Samp*.93))}}{75 * 0.93}$*100

LCS = $\frac{\text{Recovery}}{75}$*100

ICV, CCV = $\frac{\text{Recovery}}{80}$*100

Dup = $\frac{\text{Sample-Dup}}{\text{Average}}$*100

Cal. Stand. ID: _____

CVS Stand. ID: _____

Date of Anal. _____

Time of Anal. _____

Comments

01/16/04
Revision 3.0

Fig. 8.8 Laboratory Bench Sheet (Cont'd)

TOTAL PHOSPHORUS

Method 365.2

Sample	Freq	No	Dil	Absorb	Conc mg/l	Reported Conc mg/l	QC	Windows
Curve Blank	1 W	0						N/A
Curve 0.02	1 W	0.02						N/A
Curve 0.05	1 W	0.05						N/A
Curve 0.10	1 W	0.1						N/A
Curve 0.20	1 W	0.2						N/A
Curve 0.50	1 W	0.5						N/A
Curve 0.90	1 W	0.9						N/A
Method Blank	5 D	B						≤ 0.02
ICV 0.10 PPM	5 D	ICV						80-120%
NPDES Station, **Comp**	4 D	14						N/A
NPDES Station, Field Dup	5 Y	14 fd						
Matrix Spike 0.10 PPM	2 D	14 ms						75-125%
C-301 effluent	5 D	8						N/A
PCT-201 Eff	5 D	25						N/A
PCT-202 Influent	5 D	3						N/A
C-302 effluent	5 D	9						N/A
PCT-202 Eff	5 D	26						N/A
Duplicate	2 D	26 d						rpd≤20%
PCT-201 Influent	5 D	2						N/A
Check stand	W	CVS						
LCS 0.10 PPM	2 D	LCS						80-120%
LCD 0.10 PPM	2 D	LCD						80-120%
[illegible]10 PPM	5 D	CCV						80-120%
[illegible]	5 D	CCB						≤ 0.02

Slope = _____

y-int = _____

Corr = _____

$$MS = \frac{MS\ rec - (Sample\ rec * .9)}{0.10} * 100$$

$$LCS\ \&\ ICV = \frac{Recovery}{0.10} * 100$$

$$Dup = \frac{Sample - Dup}{Average} * 100$$

Cal. Stand. ID: _____

CVS Stand. ID: _____

Date of Anal. _____

Time of Anal. _____

Phosphorus Curve Generated:

_____

Comments

01/16/04
Revision 3.0

Fig. 8.8 Laboratory Bench Sheet (Cont'd)

TOTAL SUSPENDED SOLIDS

Methods160.2 and 160.4

Sample	freq	No	Cruc	Vol ml	Init. Cr+ Filter Wt g	Dried Cr + Filter wt. g	Ash Cr + Filter wt. g	TSS mg/l	Ash	VSS mg/l	Reported TSS mg/l	TSS QC
DAS Influent	W	1										N/A
DAS Influent, Field Dup	5 Y	1 fd										
PCT-201 Influent	W	2										N/A
PCT-202 Influent	W	3										N/A
PCT-201-1st Stage	5 D	4										N/A
PCT-202-1st Stage	5 D	5										N/A
PCT-201-2nd Stage	2 D	6										N/A
PCT-202-2nd Stage	2 D	7										N/A
C-301 effluent	5 D	8										N/A
C-302 effluent	5 D	9										N/A
Tert.Filter Influent	2 D	10										N/A
Tert.Filter Effluent	2 D	11										N/A
NPDES Station, **Comp**	4 D	14										
Second weighing												N/A
NPDES Station, Field Dup	5 Y	14 fd										
Second weighing												N/A
PCT 201 Eff	5 D	25										N/A
PCT 202 Eff	5 D	26										
Second weighing												N/A
[illegible]21 Discharge	5 D	31										N/A
[illegible]22 Discharge	5 D	32										N/A
RSP-321 Discharge	5 D	33										N/A
RSP-322 Discharge	5 D	34										N/A
Duplicate, rpd<20%, TSS	4 D	26 d										
Second weighing												
Duplicate, rpd<20%,TSS	W	5 d										
Method Blank	5 D	B										
Second weighing												N/A
Check Stand	2 D	CVS										N/A
Nitric Acid Test												N/A
PCT-201-1st Stage	W	4										N/A
PCT-202-1st Stage	W	5										N/A
Duplicate,rpd<20%,nTSS	W	5 d										
Duplicate,rpd<20%,nVSS	W	5 d						N/A	N/A	N/A	N/A	

CVS Stand. ID: _____

Date of Anal. _____

Time of Anal. _____

Comments

BIOMASS AND CARBON

Method ZP-115

Sample	Freq	No	TSS	ASH	VSS	Treated TSSN	Treated ASHN	Treated VSSN	Carbon VSSN/.95 mg/l	Biomass VSS-C mg/l	Carbon QC	Biomass QC
PCT-201-1st stage	W	4									N/A	N/A
PCT-202-1st stage	W	5									N/A	N/A
P[illegible]1-2nd stage	W	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]-2nd stage	W	7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P[illegible]2-1st stage	W	5 d										

Date of Anal. _____

Time of Anal. _____

Weekly

ALKALINITY

Method 310.1

Sample	Freq	No	Sample Vol ml	Acid Vol ml	Acid Vol ml	Conc mg/l	Reported Conc mg/l	QC	Windows
[illegible] Blank	W	B	50						≤20
[illegible]1 Influent	W	2	200						N/A
PCT-202 Influent	W	3	200						N/A
C-301 effluent	W	8	200						N/A
C-302 effluent	W	9	200						N/A
Duplicate	W	9 d	200						rpd≤20%
Check Stand	W	CVS	100						

H2SO4 Conc.:0.02N

Stand. H2SO4:

CVS Stand. ID:

_____

Date of Anal. _____

Time of Anal. _____

CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND

Method 405.1

Sample	Freq	No	ml Sample	ml Seed Added	ml Seed Sample	Sample DO (i)	Sample DO (f)	Seed DO (i)	Seed DO (f)	Conc mg/l	Reported Conc mg/l	QC
PCT-201 Influent	W	SB	15	0	15							N/A
PCT-201 Influent	W	SB	10	0	15							N/A
PCT-201 Influent	W	2	100	2	15							N/A
PCT-201 Influent	W	2	50	2	15							N/A
PCT-202 Influent	W	3	100	2	15							N/A
PCT-202 Influent	W	3	50	2	15							N/A
C-301 effluent	W	8	298	2	15							N/A
C-302 effluent	W	9	298	2	15							N/A
NPDES Station, **Comp**	W	14	298	2	15							N/A
NPDES Station, Field Dup	5 Y	14 fd	298	2	15							N/A
Duplicate, RPD<20%	W	2 d	100	2	15							
Meth Blank, <2.0mg/l	W	B	300	0	15							
Check Stand	W	CVS		2	15							N/A
LCS, 75-115%	W	LCS	6	2	15							
[illegible]5-115%	W	LCD	6	2	15							
[illegible] Stand	W	CVS		2	15							

CVS Stand. ID: _____ Start Date: _____ Time: _____

LCS Stand. ID: _____ Stop Date: _____ Time: _____

TKN

Hach Method 8075

Sample	Freq	No	Vol (i)	Vol (f)	Initial TKN mg/l	Final TKN mg/l	Reported TKN mg/l	QC	Windows
Method Blank	2 W	B						N/A	N/A
PCT-201 Influent	2 W	2						N/A	N/A
PCT-202 Influent	2 W	3						N/A	N/A
C-301 effluent	2 W	8						N/A	N/A
C-302 effluent	2 W	9						N/A	N/A
Duplicate	2 W	2 d							≤ 20%
CVS	2 W	CVS							

CVS Stand. ID: _____

Date of Anal. _____

Time of Anal. _____

NO2\ NO3

Hach Methods 8507 and 8192

Sample	Freq	No	[NO3] + [NO2]	DIL	Reported [NO2]+[NO3] mg/l	[NO2] Nitrite	DIL	[NO2]	Reported [NO2] mg/l	[NO3] Nitrate	Reported [NO3] mg/l	[NO3] QC
BLANK	W	B										N/A
PCT-201 Influent	W	2										N/A
PCT-202 Influent	W	3										N/A
C-301 effluent	W	8										N/A
C-302 effluent	W	9										N/A
Duplicate	W	9 d										
[illegible]2 mg/L	W	LCS										50-120

CVS Stand. ID: _____ Date of Anal. _____ Time of Anal. _____

Fig. 8.8 Laboratory Bench Sheet (Cont'd)

MONTHLY

HARDNESS

Name	Freq	No.	Sample ol (mLs)	Drops	Drops x 20	Hardness	QC	Windows
DAS Influent	M	1	5					N/A
Filter Influent	M	10	5					N/A
NPDES Station, **Comp**	M	14	5					N/A
Method Blank	M	B	5					N/A
Duplicate	M	1 d	5					RPD≤20%
CVS	M	CVS	5					

CVS Stand. ID: _____

Date of Anal. _____
Time of Anal. _____

TOTAL SOLIDS

Method 160.3

Name	FREQ	CRUC	Vol ml	Cru Wt g	Wet Smp + Cru Wt g	Dry smp + Cru Wt g	Solids %	Reported TS%
Cake	/ req							
Sludge	/ req							
Filter	/ req							
Cake	/ req							
Sluge	/ req							
Filter	/ req							

Date of Anal. _____
Time of Anal. _____

8.6 SITE SPECIFIC DOCUMENTS

8.6.1 Site Specification Manual or Permit

Site specification or permit changes are issued to the Operations Contractor by the United States Army Corp of Engineers (USACE). On those occasions when a change in procedure must be implemented, a revision will be distributed to either the Facility Manager or Laboratory Manager and the material will be incorporated into the appropriate document. A record of all changes is maintained by the Operations Contractor.

8.6.2 Procedural Manuals

Two manuals, the Facility Operations and Maintenance Manual and Site Safety and Health Plan have been written for site specific use to aide plant operators and analysts in routine procedures. The Operations Contractor provides a Quality Assurance Project Plan and Standard Operating Procedures for sampling and analyses. Manuals are reviewed annually for content. A revision may be initiated due to a scheduled change in procedure, a finding resulting from an internal or external review, or associated agency feed back.

The appropriate author (person within the area of expertise – Operations Manager, Safety Officer, Laboratory Manager) formulate a draft procedure or revision. This precursor or revision to the document is widely distributed to the appropriate department or agency, who review the draft and submit comments. Documents and associated revisions are approved by state and federal agencies and by the contracted design, construction, and operations corporation (if applicable). After comments on the document are received, included, modified, or rejected, and the appropriate approval signatures are obtained, the document is considered final. Documents which undergo revisions are removed from circulation and are replaced with the approved updated version. A record of all changes is maintained by the Operations Manager or Laboratory Manager.

8.7 PRESERVATION AND STORAGE OF RECORDS AND REPORTS

Operation and laboratory records will be stored to minimize deterioration or loss. Operation records include reports, daily logs, off-site laboratory data, quarterly groundwater sampling Field Data Reports, maintenance work orders, safety materials and documentation, meeting agendas and minutes, and memoranda. Laboratory records include inorganic and organic bench sheets, quality control results, GCMS instrumentation data, log books, purchase orders, standard certifications, and memoranda. All records will be retained by the Ott/Story/Cordova facility until release is granted by the United States Army Corp of Engineers (USACE) or Michigan Department of Environmental Quality (MDEQ).

8.7.1 Hard Copy Storage

A filing system has been implemented for both operation and laboratory records. These records are stored in appropriately labeled filing cabinets in either the Operations Office or On-Site Laboratory. For long term storage the records are combined and filed in the Second Floor Storage Area. Folder organization within each cabinet is by month and year. The filing cabinet's location, label, and content are as follows:

<u>Operator's Office</u>

- "Daily Activity Log" includes the original copy of the Monthly Operating Report and the daily logs.

- "Off-Site Laboratory Results" contains wastewater, air, TCLP and sludge data reports issued to this facility from the off-site laboratory. These reports include analytical sample data, quality control sample results, and the chain-of-custody.

- "Quarterly Report" contains the original copy of the Groundwater Monitoring Report, the Groundwater Sampling Field Data Forms and the quarterly data report issued to this facility

by the off-site laboratory. The off-site laboratory report is comprised of analytical sample data, quality control sample results, a narrative, and the chain-of-custodies.

- "Well Static Logs" contains the Monitoring Well Static Water Levels documentation.

- "Maintain-It" contains closed (completed) maintenance work orders.

- "Safety" contains training records and accident reports.

On-Site Laboratory

- "Analytical Data" contains inorganic and organic laboratory bench sheets and GCMS instrumentation data.

- "Laboratory Manuals" contains manufacturer's operations and maintenance manuals for laboratory equipment.

- "Administration" contains purchase orders, calibration records, refrigerator, incubator and oven temperature records, standard certificates, and standards and extraction log books.

8.7.2 Diskette Storage and Log Books

Most operation and laboratory records are archived by diskette as well as hard copy storage. Monthly, quarterly, daily log and static level reports and their associated forms are transferred to diskette for long-term storage. In addition, miscellaneous items such as memoranda, "Maintain-It" work orders, meeting minutes and safety records are stored electronically. All laboratory standard operating procedures, Excel entered inorganic data and GCMS instrumentation output are stored on diskette. An Operation and Laboratory Log Book is maintained to document the location of the archived data and to permit retrieval of this data at a later date. During the annual internal audit, it is verified and documented that all hardcopy and electronic records are stored according to the practices described in this section.

9.0 REGULATORY MECHANISMS

9.1 INTRODUCTION

The federal and state government has enacted several regulations designed to monitor and reduce pollution in our water, soil, and air. Regulations have also been established to assure the safety of all employees in the remediation of contaminated sites. Four types of samples are collected at the Ott/Story/Cordova site: wastewater, groundwater, air and sludge samples. The legislation governing the collection, analysis, disposal, or redemption of wastewater, groundwater, air and sludge and employee safety are respectively, CWA, CERCLA/SARA, CAA, RCRA. and OSHA. Although this legislation does not provide specific guidelines for quality assurance, quality control and operational programs, it is the motivation behind most policies. As a result, all regulatory requirements set forth by the federal government are met and exceeded by the operation and quality control programs implemented at this facility.

9.2 LEGISLATION

The major pieces of legislation are summarized as follows:

9.2.1 CERCLA/SARA (Groundwater)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as Amended in the Superfund Amendments and Reauthorization Act (SARA). The intent of these two acts, commonly referred to as Superfund, are to clean up "Long Term" uncontrolled or abandoned hazardous wastes at National Priorities List (NPL) sites. Congress established the Superfund Program to govern "Short Term" accidents, spills, and other emergency releases of pollutants into the environment. Congress passed CERCLA on December 11, 1980. This law created a tax on chemical and petroleum industries and the EPA was given the authority to require responsible parties to assist in the cleanup. CERCLA was amended by SARA on October 17, 1986. The SARA reauthorization included site-specific amendments, new technical requirements, additional enforcement authorities, and the generation of the emergency Planning

and Community Right-to-know Act. The development of methodologies followed soon after these laws were enacted. In Region 5, CERCLA and SARA are administered by the Superfund Division.

9.2.2. RCRA (Groundwater, Sludge)

The Resource Conservation Recovery Act (RCRA) was established in 1976. RCRA focuses only on active facilities and does not address abandoned sites (see CERCLA). RCRA gave EPA the authority to monitor hazardous wastes from "cradle-to-grave". This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. One of the major provisions of RCRA is to protect groundwater from the migration of hazardous substances from waste sites into the groundwater. This act also set forth guidelines for the control of non-hazardous wastes. In 1984, RCRA was amended by the Federal Hazardous and Solid Waste Amendments (HSWA) to address the phasing out of land disposal of hazardous waste and initiated the underground storage tank program. The primary analytical methods required for RCRA monitoring are published in EPA Test Methods for Evaluating Solid Waste, SW-846. This document describes sample collection practices, sample preparation techniques, and analytical procedures for groundwater, soils, and solid wastes.

9.2.3 CWA (Wastewater)

The Federal Water Pollution Control Act Amendments were enacted in 1972. As amended in 1977, this law became commonly referred to as the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) was created. NPDES is the primary regulatory mechanism for controlling wastewater discharges into US waters and in Michigan is managed by the Michigan Department of Environmental Quality. Any facility discharging process waters into US waters must obtain a permit and monitor its influent and effluent for specified pollutants. The primary analytical methods required for NPDES sample analyses are outlined in 40CFR Part 136.

9.2.4 CAA (Air)

The Clean Air Act (CAA) was established in 1970 and had subsequent amendments in 1977 and 1990. The CAA regulates air emissions from area, stationary, and mobile sources. The act established the National Ambient Air Quality Standards (NAAQS) and implemented national standards at the state level through the development of State Implementation Plans (SIP's). Amendments made to the CAA since 1990 have significantly expanded air quality regulations by addressing issues with acid rain, ozone levels and depletion, and additional air pollutants. In particular, Title III (Air Toxics) and Title V greatly expanded the scope of the National Emission Standards for Hazardous Air Pollutants (NESHAP) program. The primary analytical methods required for air sampling include the NIOSH Manual of Analytical Methods, ASTM, and the EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air.

9.2.5 OSHA (Safety)

The Occupational Safety and Health Administration (OSHA) of the federal government was established by the Occupational Safety and Health Act in 1970. The mission of OSHA is to provide safe and healthy working conditions for all employed men and women. OSHA promulgated Permissible Exposure Limits (PELs) for a wide variety of chemicals that may be present in the work place. These PELs were adapted from the Threshold Limit Values (TLV) of the American Conference of Governmental Industrial Hygienists (ACGIH). In addition, some consensus standards from the American National Standards Institute (ANSI) were also adopted. The OSHA health and safety standards are outlined in 29CFR Part 1910.

9.3 AGENCIES AND CONTACTS

Brian J. Bouwhuis
U.S.A.C.E. - Grand Haven
P.O. Box 629
Grand Haven, MI 49417
616-842-5510 - Ext 17

Lisa Summerfield
MDEQ-ERD
Superfund Section
P.O. Box 30426
Lansing, MI 48909-7926
517-335-3388

Thomas P. Berdinski
MDEQ-WD
Grand Rapids State Office Building
350 Ottawa Avenue
Grand Rapids, MI 49503
616-356-0212

John Fagiolo
U.S.E.P.A.
Mail Code HSR-6J
77 West Jackson Blvd.
Chicago, IL 60604-3590
312-886-0800

OSHA
State of Michigan
Dept. of Consumer & Industry Services
General Industry Safety
7150 Harris Drive
PO Box 30644
Lansing, MI 48909-8144
800-866-4674

9.4 SPECIFIC SITE REPORTING REQUIREMENTS

Reporting requirements for a number of events or situations are described in the site's NPDES Permit No. MI0053309, Part II, Section C. Additionally, the Michigan Department of Environmental Quality (MDEQ) has directed operations personnel to comply with the following notification requirements under the described circumstances which are not specifically included in the NPDES permit.

9.4.1 Effluent Release to Surface Waters

The Ott/Story/Cordova GWTF effluent line is a pressurized force main carrying treated groundwater to the site's outfall located on the north branch of the Muskegon River, about 3 miles from the plant. Over this distance, the pipeline runs near and under several creeks, streams and ditches carrying surface water. Although the effluent is extensively treated and monitored, it may only be discharged to the authorized outfall location specified in the NPDES permit. If a break or leak is detected in the effluent line, discharge from the facility must be immediately stopped and the plant put into recirculation mode as described in Section 3.2.4 of this Operation and Maintenance Manual. The facility discharge may recommence after the necessary repairs to the effluent line have been completed. If treated effluent is released to any surface waters other than the authorized outfall located on the north branch of the Muskegon River, the incident must be reported to the MDEQ-SWQD office as specified in Part II, Section C.6.b of the NPDES permit. Copies of the written report will also be sent to the site project managers of the USACE, MDEQ-ERD and USEPA at the addresses listed in Section 9.3 of this Operation and Maintenance Manual. The MDEQ-SWQD Grand Rapids District Supervisor will determine if further action regarding the incident is required.

9.4.2 Effluent Release to the Ground

If a break or leak is detected in the effluent line, discharge from the facility must be immediately stopped and the plant put into recirculation mode as described in Section 3.2.4. The facility discharge may recommence after the necessary repairs to the effluent line have been completed. If treated effluent is not released to any surface water (that is, if the leak simply soaks into the ground), the reporting requirements in Part II, Section C.6.b of the NPDES permit do not apply. Instead, the facility Operations Manager will provide e-mail notification to the site project managers of the USACE, MDEQ-ERD, MDEQ-SWQD and USEPA within 24 hours of becoming aware of the incident. The notification will describe what occurred, when and where the leak was discovered, steps taken to remedy the problem, and an estimate of the volume of treated effluent released.. The MDEQ-ERD will determine if any additional response is required.

10.0 STAFFING

Operation and maintenance of the Ott/Story/Cordova Groundwater Extraction and Treatment Systems is performed by personnel properly qualified and trained according to requirements specified in the O&M contract documents. The facility is staffed ten hours per day, five days a week. However, operators are always accessible by an autodialer controlled through the DCS that monitors system processes. Notification of an alarm condition at the facility results in a prompt response by on-call personnel.

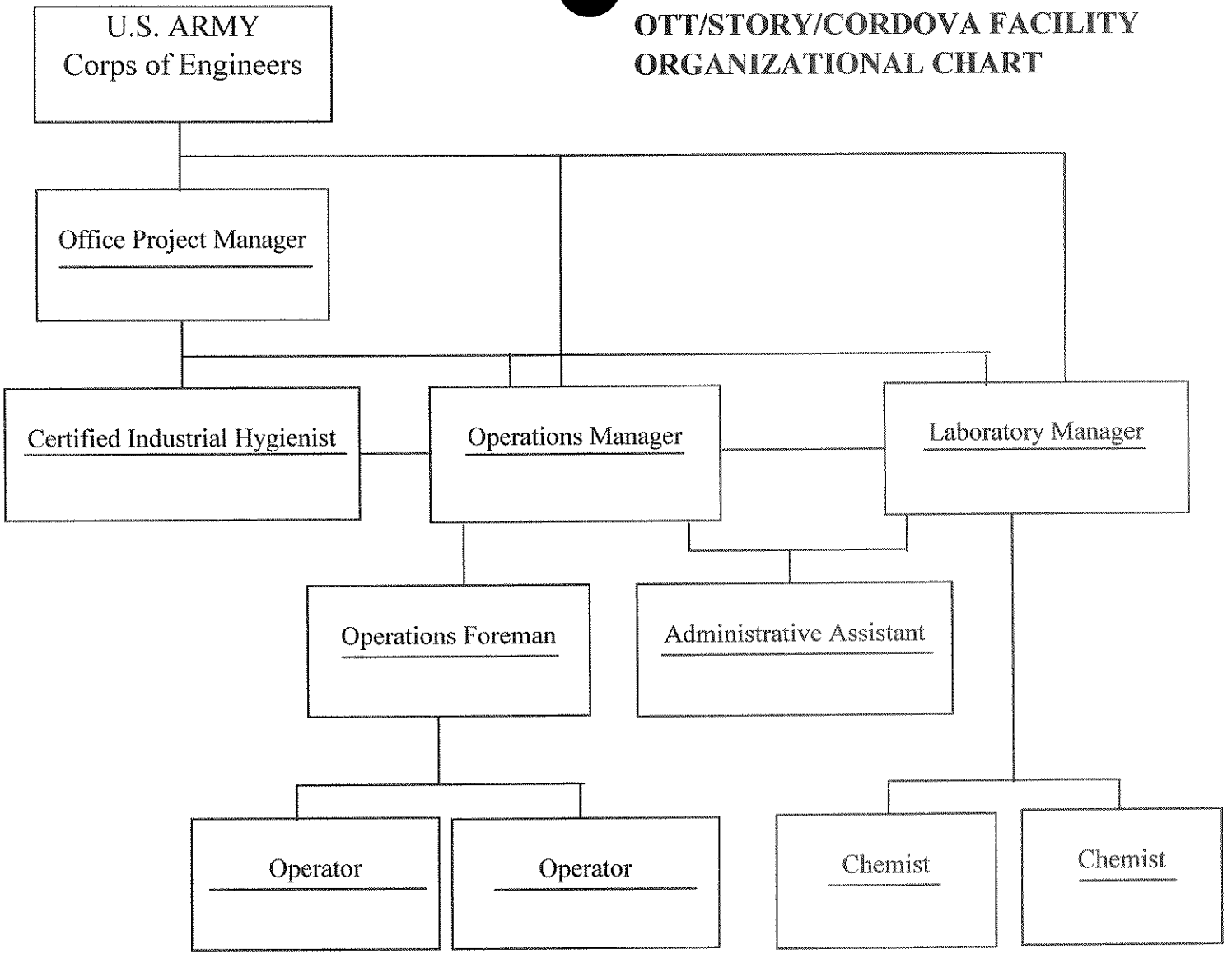
The organizational chart provided in Figure 10.1 illustrates the current chain of command in place at the Ott/Story/Cordova treatment facility. The United States Army Corps of Engineers, Michigan Department of Environmental Quality and United States Environmental Protection Agency direct the operations contractor to perform general operational and maintenance tasks. Operations staff carry out these directives in the best way possible, based on their experience and training. Job descriptions and minimum qualifications for the specified operations positions are provided in the following subsections.

10.1 JOB DESCRIPTIONS AND QUALIFICATIONS

It is the responsibility of the GWES and GWTS operations staff to maintain all components of both systems according to manufacturers' specifications. A preventive maintenance program has been developed for this facility and the requirements of the program, including scheduled lubrication, system component inspection and replacement, equipment testing, component cleaning, scheduled process equipment alternation, general housekeeping and required record-keeping will all be carried out by maintenance personnel.

Corrective maintenance is performed by operations staff to repair or replace system components that break down or wear out. A spare parts inventory is maintained to expedite replacement of consumable components. Maintenance activities are documented in order to monitor their frequency and aid in predicting future incidents.

FIGURE 10.1
OTT/STORY/CORDOVA FACILITY
ORGANIZATIONAL CHART



Operations staff perform laboratory testing of samples from various process monitoring locations and, based on analytical results, make adjustments necessary to optimize treatment processes. These adjustments may include chemical feed rates, air flow rates, recirculation rates and process flow patterns.

Operations staff is responsible for reviewing operation and analytical data from both the on-site and off-site laboratories, compiling the required daily, monthly, and quarterly operational reports and distributing these reports as required. Although not required to interpret the results of such monitoring events, operations staff measure monitoring well water levels at the required frequency and provide this data to the proper agencies. Operations staff is responsible for properly collecting all water samples required for monthly and quarterly monitoring events, and transporting the samples to a USACE validated laboratory for analysis.

In general, the Operations Manager will ensure that the GWES and GWTS are operated in the most efficient and cost-effective manner possible, while still meeting all operating requirements and discharge limits. The manager is responsible for training operations staff in the proper operation and maintenance of the systems, assigning maintenance tasks and reviewing work performed by operators for completeness and quality. The manager will make sure that all bulk treatment chemicals are in adequate supply and reorder them as necessary. Activated granular carbon change-outs will be ordered when required.

The Operations Manager will receive operating instructions from the Site owners or representatives (USACE, USEPA and MDEQ) and implement them in a timely manner. All monthly operating reports will be reviewed and signed by the manager prior to submitting them to regulatory agencies. Though the operations manager may be involved in public relations concerning the site, including plant tours and speaking engagements, all such events must be coordinated through the USACE or MDEQ.

The O/S/C Groundwater Treatment Facility has been classified by MDEQ as requiring a designated operator certified in the following industrial classifications:

A.1.b (1)	Plain Sedimentation
A.2.b	Filtration of Wastewater
A.2.d.	Gas Stripping
A.2.h. (2)	Filter Press of Sludge
B.1.a	Sludge Conditioning
B.2.a. (1)	Chemical Clarification – Chemical Coagulation
B.2.a (2)	Chemical Clarification – Chemical Precipitation
B.3.b.	Carbon Adsorption
C.3.a	Activated Sludge

Staffing requirements at the O/S/C Groundwater Treatment Facility include an operations manager, laboratory manager/report administrator, two chemists, administrative assistant, maintenance foreman, and two operators. A third operator position is filled in an approximately one-half-time capacity. Job descriptions and qualifications for these positions follow.

10.1.1 Operations Manager

The Operations Manager works directly with the USACE, negotiating and preparing the operations contract, and provides them the necessary supporting documentation showing contractual obligations are being met. The Operations Manager is responsible for ordering and paying for bulk chemicals, operational supplies, tools and equipment, and for scheduling work performed by subcontractors under separate contract agreements. Additional responsibilities include distribution of the required reports generated by operations staff, preparing submittals, requests for information (RFIs) and system operating reports, and serving as chairperson of the monthly operating meetings with representatives of regulatory agencies.

The Operations Manager assigns, supervises and reviews the work of employees engaged in the operation and maintenance of the GWES and GWTS. This position is responsible for the training of facility operators in treatment methods, practices and procedures, preparing work schedules, and supervising the preparation of required records and reports. The Operations Manager reviews process parameters and analytical laboratory results to determine any

operational adjustments necessary to optimize the treatment system processes. This individual also acts as the site's Safety Coordinator and ensures proper precautions are exercised by employees whenever restricted or exclusion zones are entered, trains staff in the use of safety equipment, maintains this equipment to keep it in good operating condition, presents weekly safety talks, and maintains health and safety records.

The Operations Manager will have a bachelor degree in a field of natural science from an accredited university, a State of Michigan Class A Wastewater Treatment Operator License, and the additional industrial certifications required by MDEQ for operation of this site.

10.1.2 Laboratory Manager/Report Administrator

This person is responsible for the establishment of analytical procedures and techniques used in the on-site laboratory consistent with regulatory requirements, and maintains USACE validation status. The Laboratory Manager prepares written Standard Operational Procedures (SOPs) for analytical methods utilized in specific tests, trains operators and technicians in proper sampling and analytical procedures, tests and maintains equipment and instrumentation, maintains laboratory inventory and orders supplies. The Report Administrator reviews all on-site and off-site analytical data for accuracy and verifies that proper quality control and quality assurance procedures have been followed. This position is also responsible for the final review of reports submitted to regulatory agencies as required by the contract documents and for conducting additional studies as directed by the facility owners.

The Laboratory Manager/Report Administrator will have a bachelor degree in chemistry from an accredited university and prior experience supervising personnel in an analytical laboratory performing environmental sampling and analyses, data review, and QA/QC verification.

10.1.3 Operations Foreman

The Operations Foreman maintains the computerized maintenance program, enters operational and maintenance data in the individual system components files, and generates and distributes

work orders to facility operators. The Foreman assists the Operations Manager in operator supervision and training, and maintains equipment and spare parts inventory in files, along with completed work orders.

The Operations Foreman will have an associate degree in a field of natural science from an accredited university, a State of Michigan Class B Wastewater Treatment Operator license, and the additional certifications required by MDEQ for operation of this site.

10.1.4 Laboratory Chemists

The Laboratory chemists perform routine general chemistry and GCMS analyses according to written SOPs for both process knowledge and to fulfill NPDES permit requirements. Responsibilities include preparing bottle orders and collecting daily routine samples, analyzing PE and MDEQ and USACE split samples, maintaining laboratory bench sheets and instrument maintenance logs, maintaining laboratory equipment and instruments, reviewing data and QA/QC parameters, entering data into computer spread sheets, preparing quality control charts, performing the monthly laboratory inventory and ordering supplies, and assisting the Laboratory Manager in method development.

The Laboratory Chemists will have bachelor degrees in chemistry or a related science and prior experience working in an environmental analytical laboratory.

10.1.5 Administrative Assistant

The Administrative Assistant manages the facility front office by answering telephones and directing the calls, greeting visitors, typing monthly reports, operational logs, memos and letters, and copying and distributing reports as required. Additional responsibilities include creating and maintaining the filing system, purchasing office supplies as necessary, recording staff meeting minutes and maintaining personnel records.

The Administrative Assistant will have a high school diploma, additional technical training in Microsoft Word, Excel and Access, and prior work experience in an office setting.

10.1.6 Facility Operators

Facility operators perform preventive maintenance and repairs on the plant's mechanical, electrical and structural equipment. Their duties include performing scheduled lubrication, replacing pump packing and motor bearings, cleaning and testing process equipment, painting, unloading bulk deliveries of chemicals and supplies, collecting the required water and solids samples, and maintaining facility grounds. Operators record daily measurements and meter readings and, at that time, perform an inspection of all process equipment, documenting any unusual observances or sounds that may indicate a problem. If the problem cannot be immediately corrected, it is reported to the Facility Manager or Operations Foreman so the appropriate response can be determined.

Operator tasks are assigned through work orders as described in the Maintenance Section 6 of this manual. In addition to performing the specific work described in the work orders, larger projects, such as equipment replacement or repair, may be assigned as required. Many tasks are performed individually, while other projects involve group efforts that commence only after preparatory discussions have been held to determine the appropriate means to accomplish the required work. The goal is to have all operators capable of performing operational and maintenance tasks throughout the groundwater extraction and treatment systems. Operators are responsible for maintaining the extraction wells, monitoring wells, valve vaults and groundwater collection equipment. They maintain the well cleaning trailer and equipment, acid clean wells, collect quarterly groundwater samples and measure aquifer elevations as required. Operators are responsible for testing and maintaining electrical motors and controls, calibrating process controllers and metering devices, and ensuring the facility electrical components are operating correctly and safely. Their responsibilities include grounds keeping tasks, including lawn mowing and snowplowing, building upkeep, and operation of the filter press dewatering system.

All operators will have a high school diploma or trade school training that properly prepares them to perform their assigned duties. All operations personnel will have completed 40-hour hazardous material training and be up to date with the required 8-hour refresher courses. Operators are strongly encouraged to qualify, prepare for and write examinations for certifications required by the MDNR for operation of this site.

10.2 TRAINING

10.2.1 Introduction

Training is an integral aspect of a quality operations and maintenance program. Although entry level operators and chemists are supervised and their work reviewed by experienced supervisors, many potential problems can be avoided by proper training. Direct personal training by experienced personnel provides the new employee with the appropriate knowledge needed to recognize potential problem areas and permits expedient corrective action. It is the goal of the training program implemented at this facility to provide each operator and analyst with a thorough introduction to the concepts and techniques involved in each operation, maintenance and analytical procedure.

10.2.2 Minimum Requirements for Education Training

Without the necessary education experience, the most thorough training program will not ensure an adequate understanding of the concepts behind each operational task. To facilitate an effective training process, certain minimum criteria addressing the basic academic background and experience required for employment are maintained. These minimum qualifications for each position were provided previously in this section under Job Descriptions and Qualifications.

10.2.3 Operator Training

A formal training program has been established for both entering personnel and those assigned new duties within the Operations Staff. Individualized instruction is provided to the trainee by a

person designated by the Operations Manger as particularly knowledgeable in the procedures under consideration. This experienced person works with the novice outlining the theory or goals on which the procedure is based, explaining the basic operation of applicable tools and instruments, assists in the preparation of materials required to perform the task, oversees the novice operator's work, and provides instruction in procedures as the work progresses. This permits the trainee to perform the procedure with immediate feedback from the trainer, and reinforces the understanding that there is at least one experienced individual ready to assist.

All entry level personnel are exposed to initial training programs designed to ensure that new employees are introduced to the expectations held by the operations group with regard to quality and safety. The following are examples of these types of training programs.

- Individual safety briefing by facility Safety Coordinator or Chemical Hygienist.

- Individual facility tour, general operational procedures instruction, and review of job description by Operations Manager or Laboratory Manager.

- Review of facility Operation and Maintenance Manual and/or Laboratory SOPs.

Individuals working at the facility must complete training or otherwise demonstrate competence in techniques common to performing their assigned tasks. Training involves reading relevant instructional brochures or Standard Operating Procedures (SOPs), followed by supervised practice in the techniques. Following a satisfactory supervisor's evaluation of the employee's performance of these techniques, the employee is ready to perform the procedures for which the position is responsible.

Continued training reinforces the initial training employees receive. The following types of continued training programs are utilized:

- Weekly group safety discussions (specific topic)
- Monthly group training meetings (specific topic)

- On-site training by equipment manufacturers' representatives
- Attendance at relevant training seminars sponsored by equipment vendors or other organizations.

A training file is maintained for each employee that summarizes and documents the training activities completed. Figure 10.2 shows the Class List signed by each attendee of a particular training session and Figure 10.3 is the Training Record maintained for each employee in their file. Table 10.1 provides a list of training materials available in the site operator office and contacts for off-site training seminars.

Figure 10.2

CLASS LIST

·/Story/Cordova Groundwater Treatment Facility

Training Class List

Class: _____

Date: _____

Name (print clearly)	Dept/Lab	Signature

Instructor: _____
(print clearly)

Signature: _____

GRSTR.for 11/01/93

Figure 10.3

Story/Cordova Groundwater Treatment Facility

Employee Training Record

Page_____

TRAINING RECORD

Employee: _____

Type	Dept/Lab	description	date

TRNGLG.FOR 11/01/93

TABLE 10.1

Ott/Story/Cordova Groundwater Treatment Facility

Operator Training Materials

LABORATORY:	Methods for Chemical Analysis of Water and Wastewater; USEPA, EPA – 600/4-79-020
	Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.
	Chemical Data Acquisition Plan (CDAP)
	General Process and Operation Manual for the Groundwater Treatment System O/S/C Site, Muskegon, MI, 1995, Zimpro Environmental.
SAFETY:	29 CFR PART 1910 – Occupational Safety and Health Standards For General Chemistry
	EM 385-1-1 – US Army Corps of Engineers Safety and Health Requirements Manual
	Michigan Occupational Site Safety and Health Act (MIOSHA)
	Ott/Story/Cordova Site Safety and Health Plan
GENERAL OPERATIONS:	NPDES Permit – M0053309 Part 2 Section A-4
	MOP-11 Sacramento Course (Recommended Training Course)
	Manufacturers' O & M Manuals
	O/S/C Operation and Maintenance Manual

SOURCES FOR TRAINING SEMINARS:

Michigan Water Environment Association
P.O. Box 82410
Rochester, MI 48308-2410

Michigan Department of Environmental Quality
P.O. Box 30273
Lansing, MI 48909-7773

11.0 SAFETY

Prior to the implementation of any operational or maintenance task, safety requirements and necessary precautions are first evaluated. These may include wearing the proper personal protective equipment (PPE) for working in areas of questionable air quality or where exposure to contaminated groundwater is possible. Specific safety requirements have been provided in Operation Section 5 for working in different process areas. In addition, protection of the public is necessary, particularly when work is being performed at the remote extraction well sites or valve vaults. Several of these structures are located in close proximity to residents' homes. Prior to performing any procedures using chemicals (such as when acid-cleaning wells) or whenever contaminated groundwater is being brought to the surface (during well redevelopment), notification of affected homeowners is required. This notification is currently done by representatives of the USACE. Any scheduled maintenance at these sites should be performed during hours when the residents are not typically home, to prevent their exposure to any volatile gases that may be released. If any procedures are being performed that could potentially expose neighbors, or if the work cannot be completed during the period when they are not home, temporary relocation of the residents to a hotel or boarding house will be provided for the duration of the event.

Specific safety procedures have been compiled in the Site Safety and Health Plan (SSHP), which is part of this manual by reference and is located in the operator office. The SSHP was developed to comply with paragraph (e) of the OSHA 1910.1450 standard, as well as guidelines provided in the WPCF Manual of Practice No. 1. Sections of the SSHP include:

- Accident Prevention Policy
- Respiratory Protection Program
- Personal Protective Equipment
- Hearing Conservation Program
- Chemical Materials Control & Communication
- Right-To-Know Program
- Emergency Prevention and Preparedness Plan

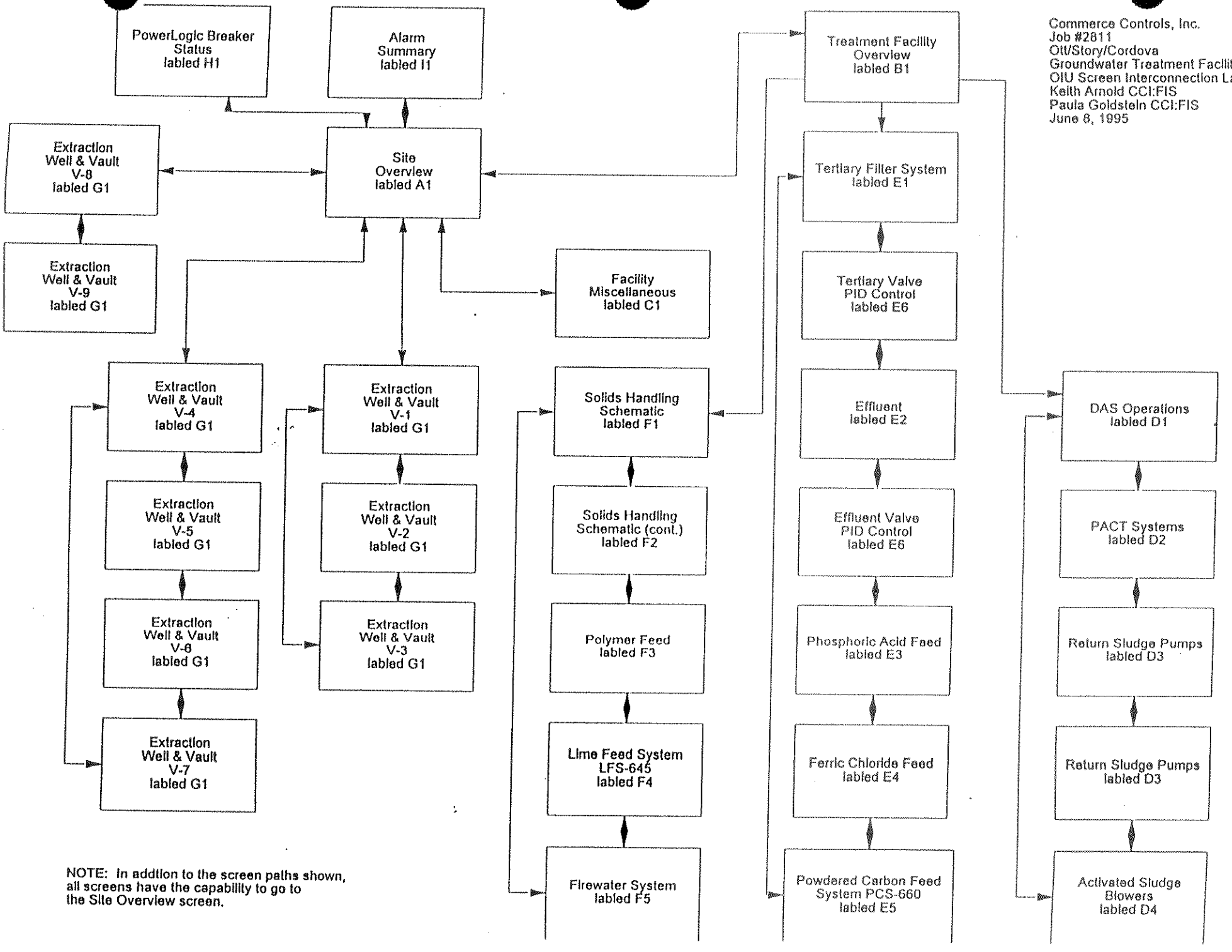
- Confined Space Entry
- Control of Hazardous Energy – Logout, Tagout
- Maintenance Work Practices
- Policy for Use, Storage and Maintenance of Ladders
- Storage and Use of Flammable Liquids
- Bloodborne Pathogens
- Chemical Hygiene Plan

All facility employees attend weekly safety meetings. These discussions are moderated by the Safety Operator, involve a new topic each week, and reinforce the need to follow proper safety practices.

APPENDIX A

DCS Process Control Screens

Commerce Controls, Inc.
Job #2811
Ott/Story/Cordova
Groundwater Treatment Facility
OIU Screen Interconnection Layout
Keith Arnold CCI:FIS
Paula Goldstein CCI:FIS
June 8, 1995



NOTE: In addition to the screen paths shown, all screens have the capability to go to the Site Overview screen.

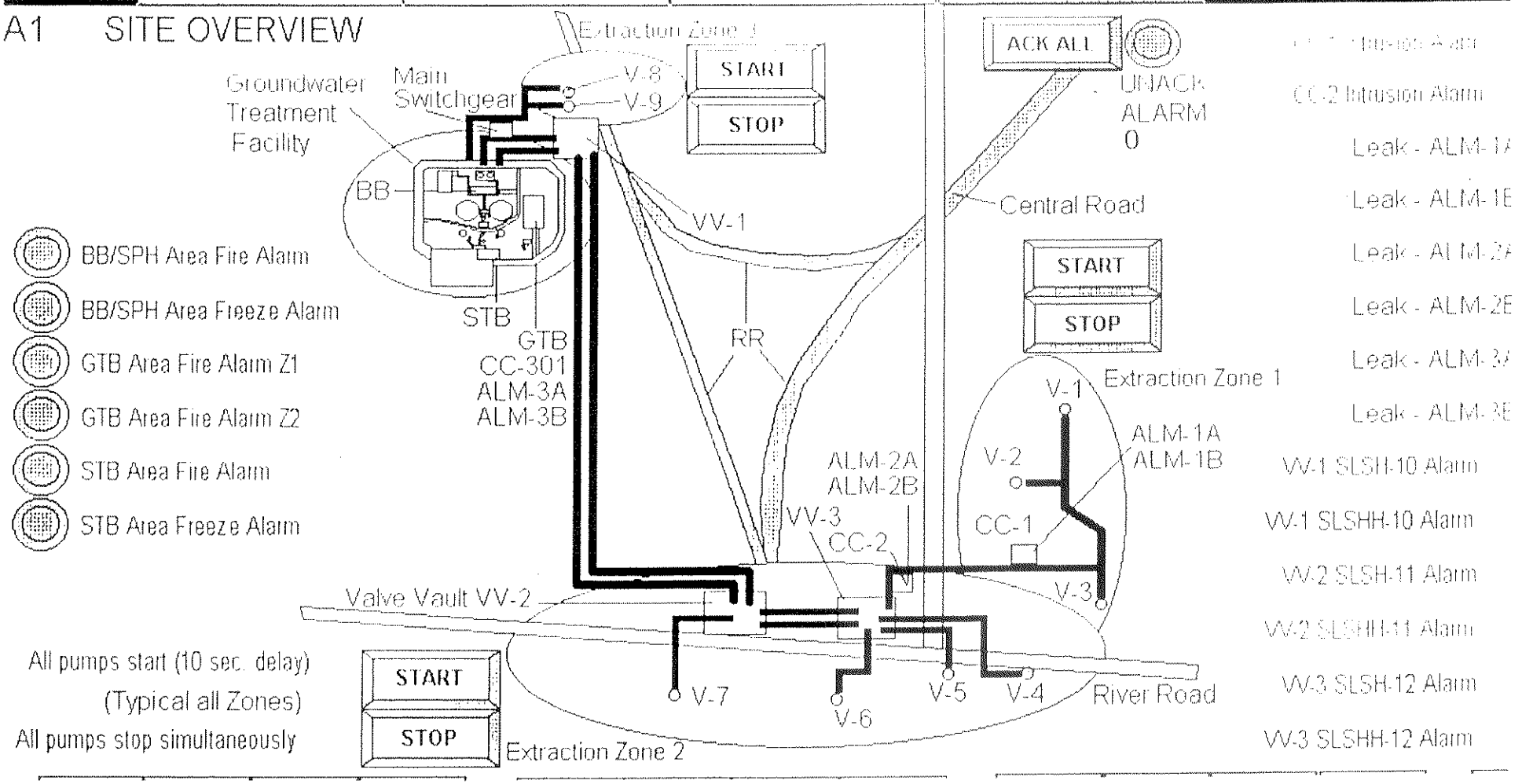
Intellution FIX View

File View Alarms Commands Applications Options

SITE.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4
✓	10:48:33	10:48:33	OIU	I1DIESAL_	CFN		Alarm To Auto Dialer Gen Alarm in Extract. Sys
✓	10:48:33	10:48:33	OIU	G1DIWP6L_	CFN		Alarm Low Level Alarm EW-6

Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3



Intellution FIX View

File View Alarms Commands Applications Options

TRTMNT.ODF

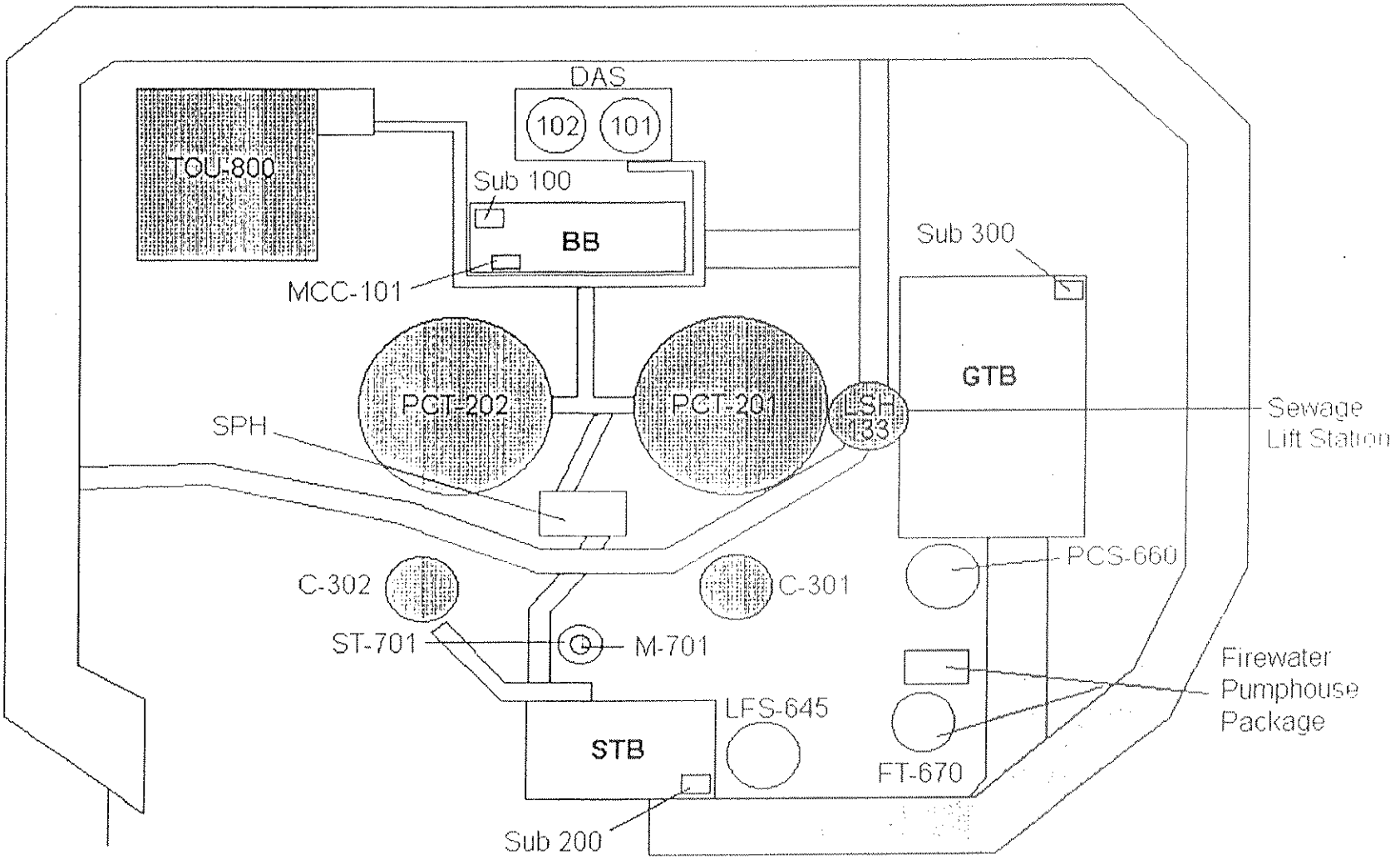
ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

B1

TREATMENT FACILITY OVERVIEW

Main Switch Gear



Intellution FIX View

File View Alarms Commands Applications Options

FACMISC.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
√	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

C1

FACILITY MISCELLANEOUS

Sludge Treatment Building

STB Sump LSH 131

General Alarm AC-751

General Alarm AC-752

Groundwater Treatment Building

GTB Sump LSH 130

PSL-935 Alarm

General Alarm AC-901

General Alarm AC-902

Blower Building

General Alarm AC-903

General Alarm AD-904

Intellution FIX View

File View Alarms Commands Applications Options

DAS.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE DESCRIPTION
√	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN	Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

D1

DAS OPERATIONS

To Thermal Oxidation Unit

From DAS Basin Sump

From Sludge Bldg Drain Collection Basin

From Water Treatment Bldg Drain Collection Basin

LSHH 100

LSH 100

From Plume Extraction Wells

From Creek Extraction Wells

From Southern Extraction Wells

From Recirculation Line

FS-100

WARNING: Operators to allow 30 seconds between blower starting!

DAS Fans

DAS-102

V V V

START

STOP

DB-122

Local

IFS

START

STOP

DB-120

Local

IFS

START

STOP

DB-121

Remote

DAS-101

V V V

To First Stage Aeration PCT-201

1,023 HRS

RESET

From PCT-202

1,361 HRS

RESET

From PCT-201

1,612 HRS

RESET

To First Stage Aeration PCT-202

DAS Blowers

START

STOP

Off

DF-132

298 HRS

RESET

START

STOP

Auto

DF-130 (Stand By)

3,573 HRS

RESET

START

STOP

Auto

DF-131

3,864 HRS

RESET

From PC

Intellution FIX View

File View Alarms Commands Applications Options

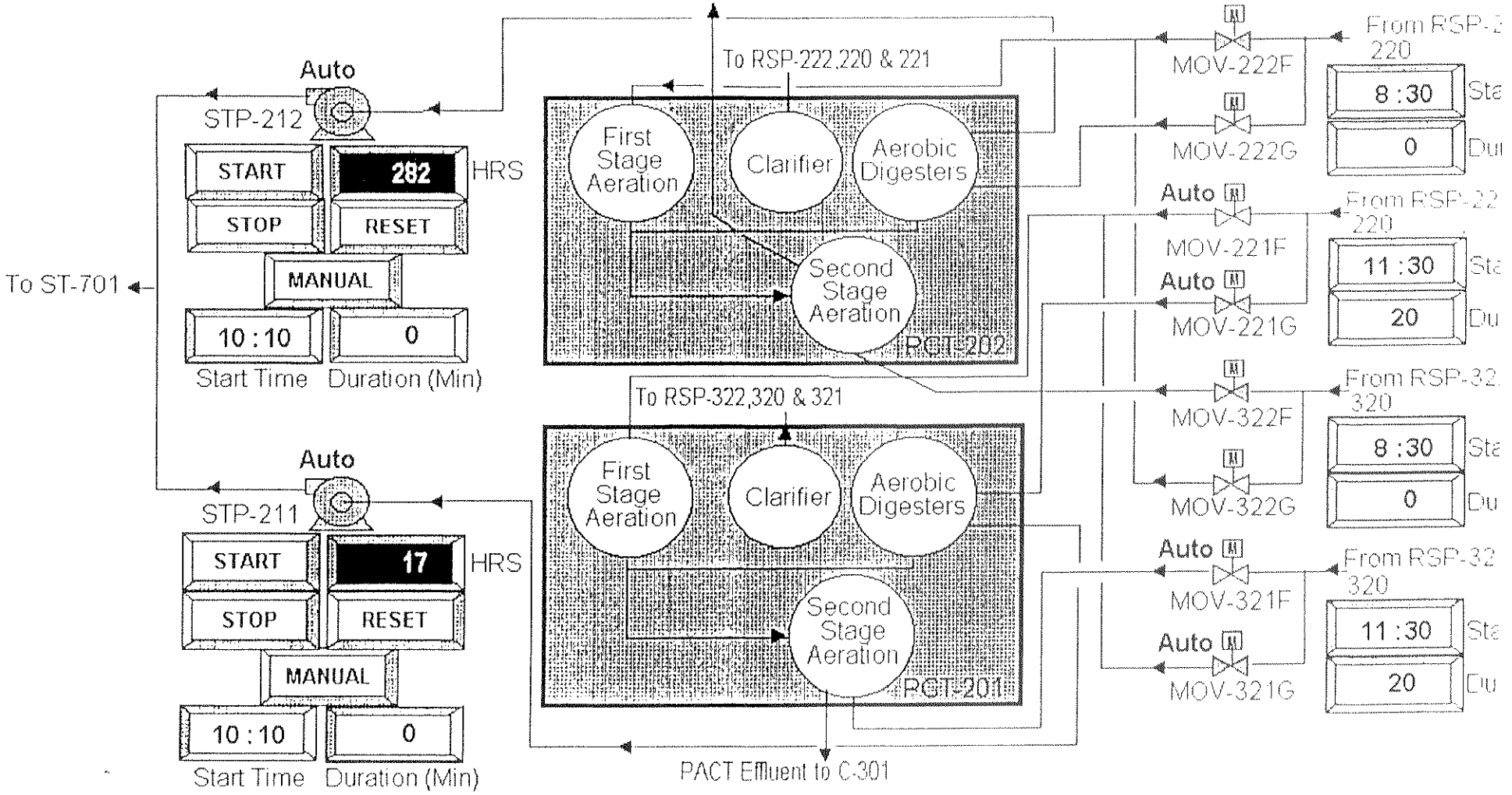
PACT.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIMP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

D2

PACT SYSTEMS



Intellution FIX View

File View Alarms Commands Applications Options

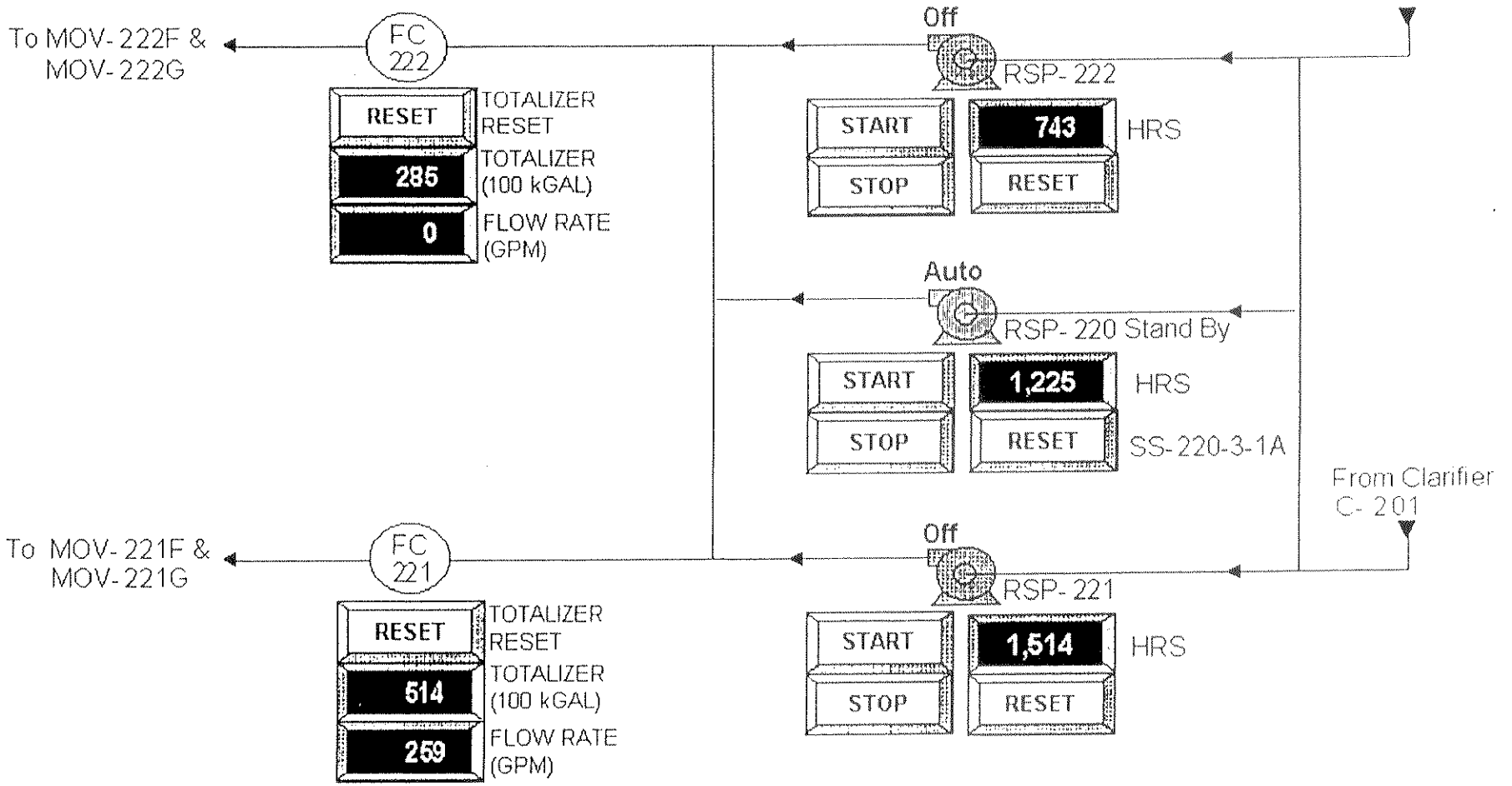
RSP.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN	Alarm	Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

D3

RETURN SLUDGE PUMPS



Intellution FIX View

File View Alarms Commands Applications Options

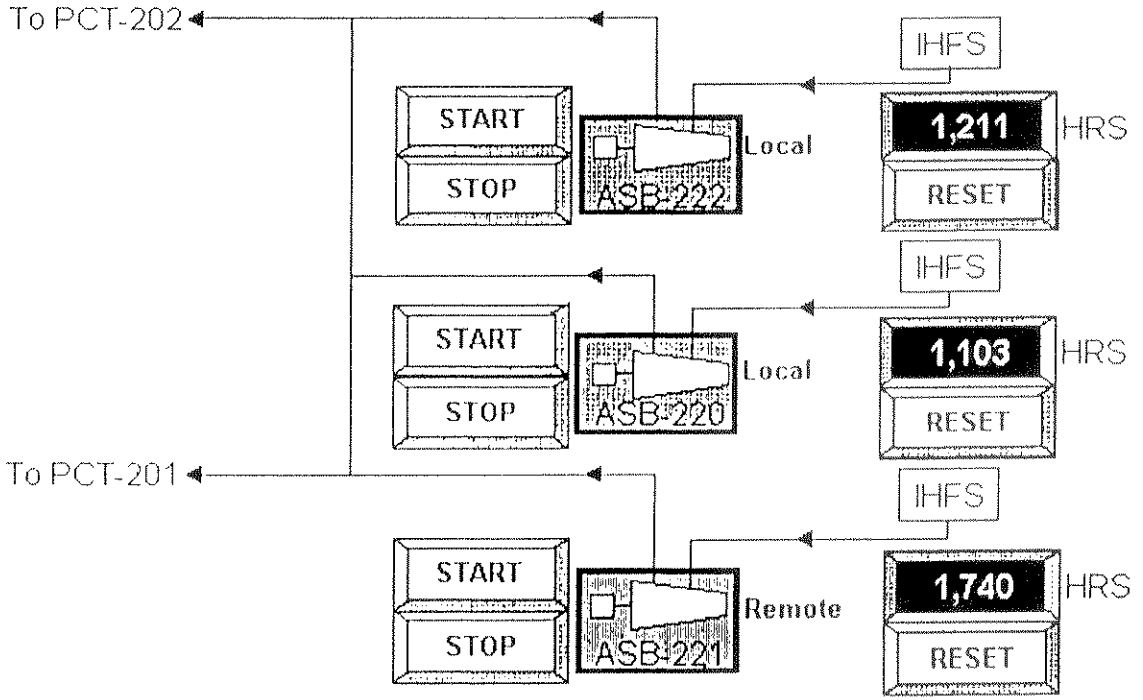
ASB.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

D4

ACTIVATED SLUDGE BLOWERS



WARNING:
Operators to allow 10 seconds between blower starting!

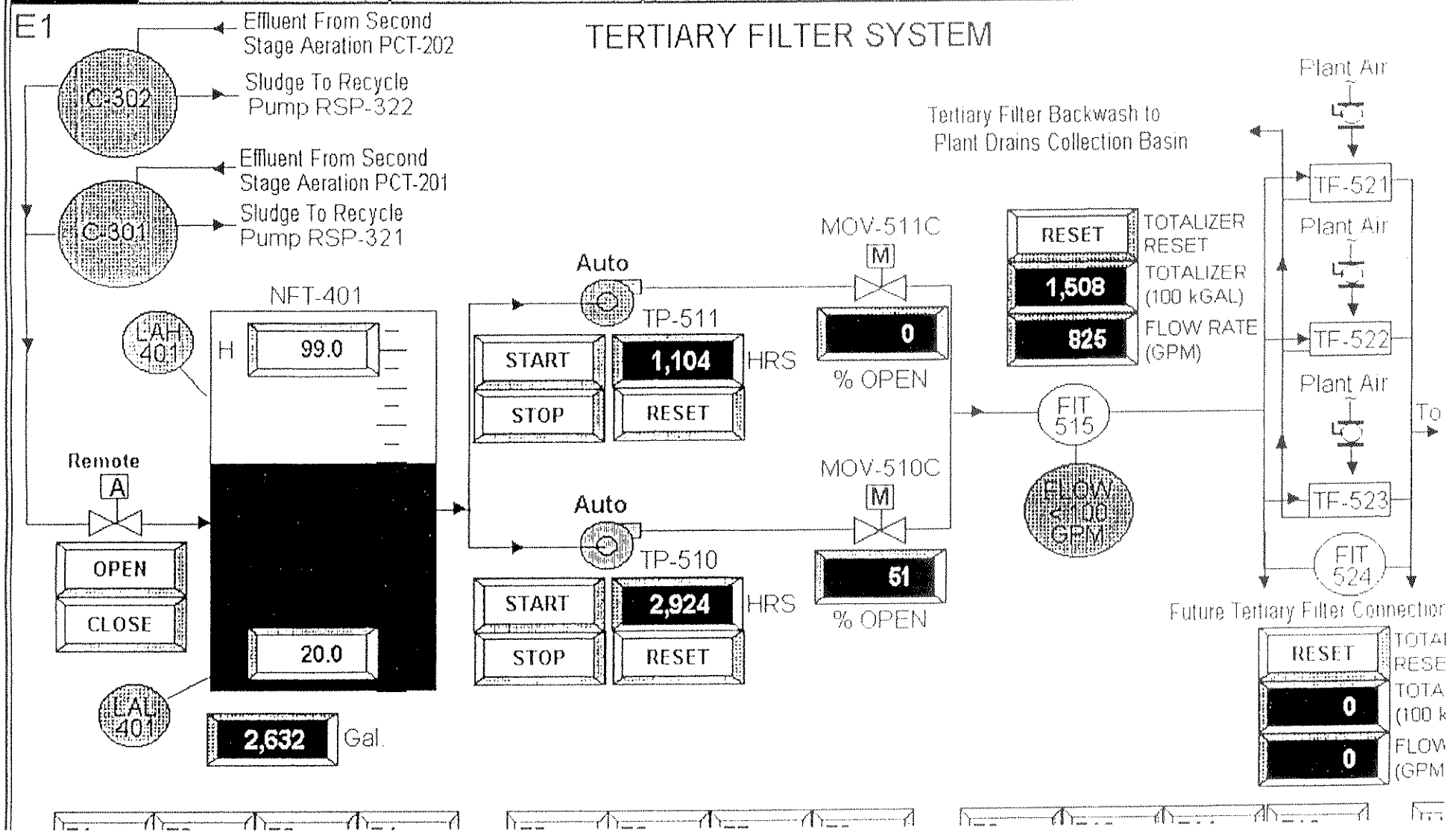
Intellution FIX View

File View Alarms Commands Applications Options

TERTFS.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	09:39:26	09:39:26	OIU	G1DIWP9L_	CFN		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4



Intellution FIX View

File View Alarms Commands Applications Options

EFFLUENT.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	09:39:26	09:39:26	OIU	GIDIWP9L_	CFM		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4

E2

EFFLUENT

From Tertiary Filters

ET-531

H 99.0

LAH 531

20.0

2,694 Gal.

LAL 531

Future Tertiary Filter Connection

Auto

DP-541

START | STOP | 1,917 HRS | RESET

MOV-541C

M

0 % OPEN

Auto

DP-540

START | STOP | 2,112 HRS | RESET

MOV-540C

M

51 % OPEN

FIT 551

CA 551A

CA 551B

RESET | 530 | 273

TOTA RESE TOTA (100 k FLOW (GPM

FIT 552

CA 552A

CA 552B

RESET | 639 | 266

TOTAI RESE TOTAI (100 k FLOW (GPM

FIT 553

RESET | 12 | 0

TOTALIZER RESET | TOTALIZER (100 kGAL) | FLOW RATE (GPM)

NMS-561

FT 561

PI 9

RESET | 1,326 | 543

TOTALIZER RESET | TOTALIZER (100 kGAL) | FLOW RATE (GPM)

TT-561 59

CT-561 794

PHT-561 7.1

Disc N E Muskegor

Intellution FIX View

File View Alarms Commands Applications Options

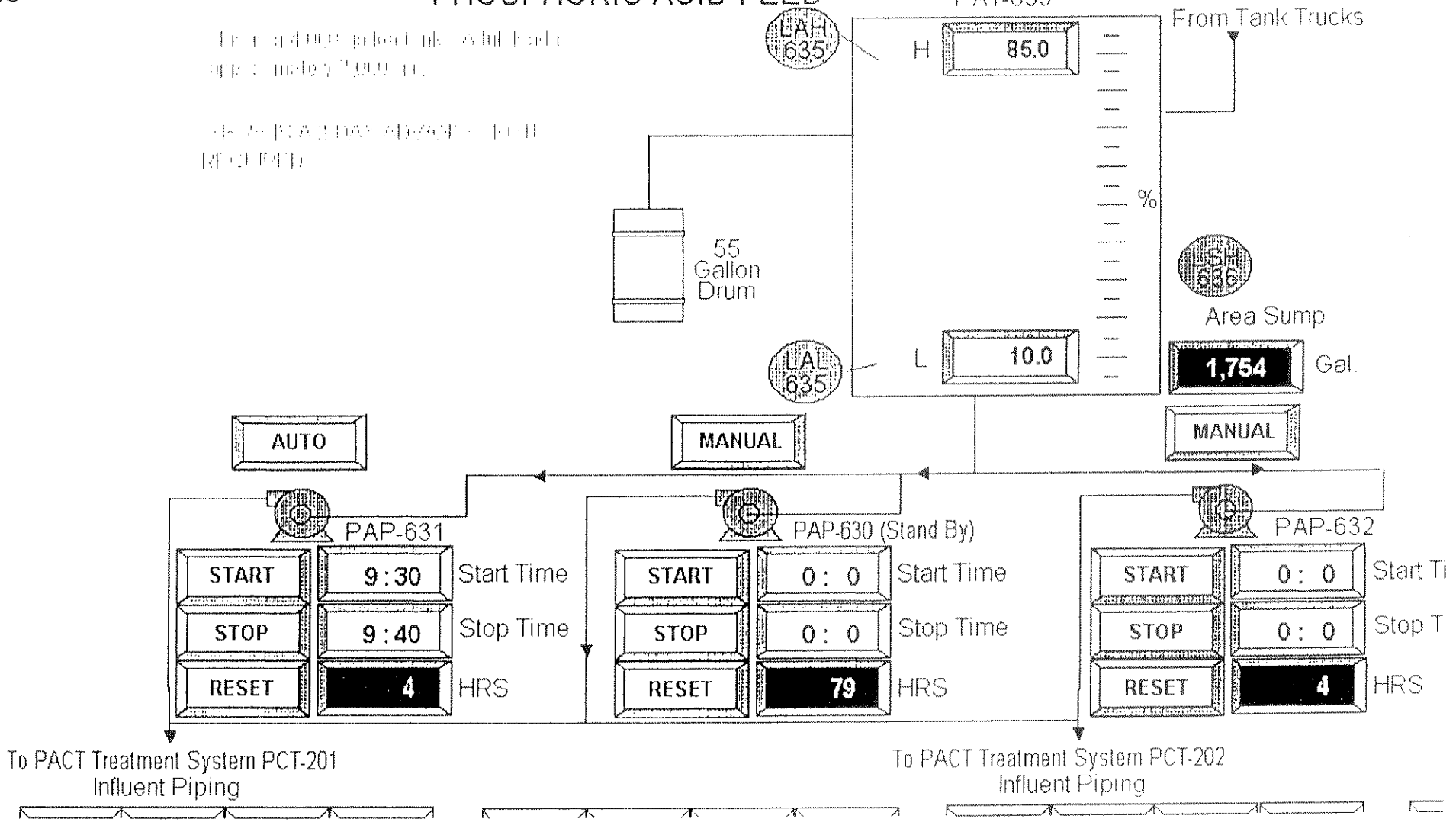
PHOSACID.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	09:39:26	09:39:26	OIU	G1DIWP9L_	CFN		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4

E3

PHOSPHORIC ACID FEED



Intellution FIX View

File View Alarms Commands Applications Options

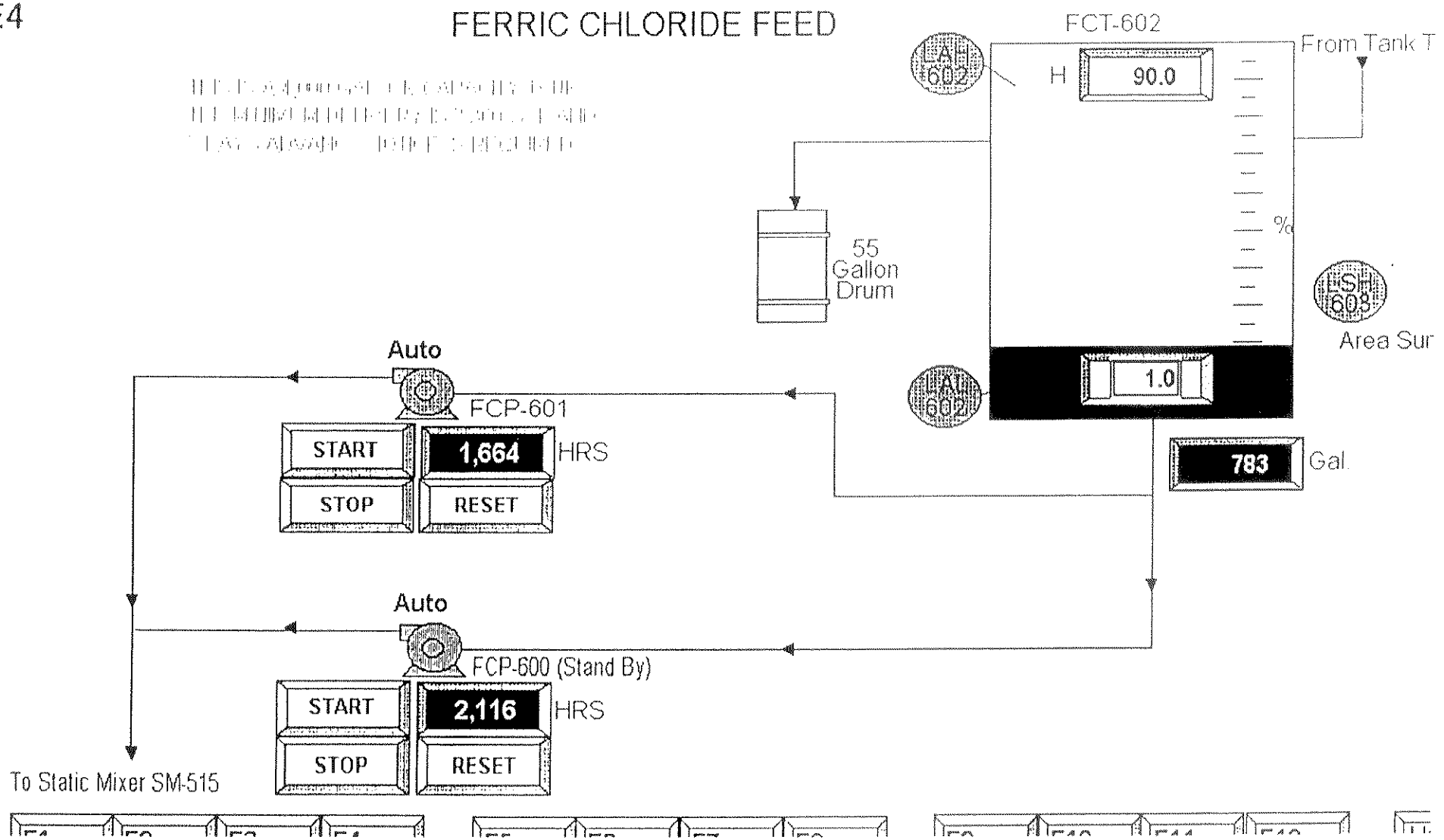
FERRIC.ODF [OIU:E4AR602L_S.F_CV]

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

E4

FERRIC CHLORIDE FEED



Intellution FIX View

File View Alarms Commands Applications Options

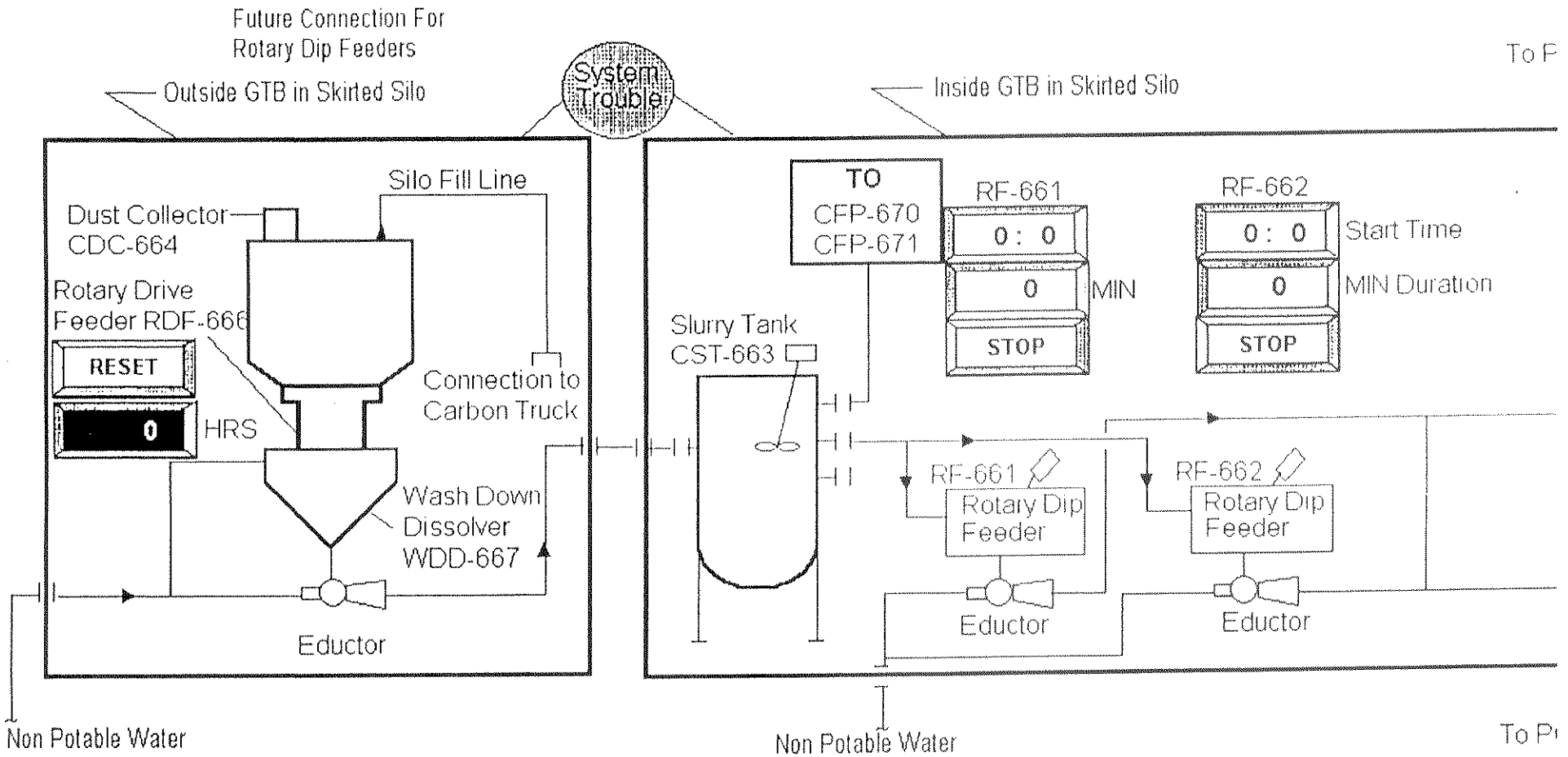
PCFS.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

E5

POWDERED CARBON FEED SYSTEM PCS-660



Intellution FIX View

File View Alarms Commands Applications Options

PID.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	09:39:26	09:39:26	OIU	G1DIWP9L_	CFN		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4

E6

TERTIARY VALVE PID CONTROL

Tertiary Discharge Valves

NFT-401 Tank Level	85	INCHES
NFT-401 Tank Level Set Point	80	INCHES

TP-510

VALVE MOV- 510C

PID Gain	1.0	0.1 - 5.0
PID Reset Time	1	1 - 50 / MIN.
PID Dead Band	1	INCHES
	50.0	% Output in Manual
	52.9	% Output in Auto

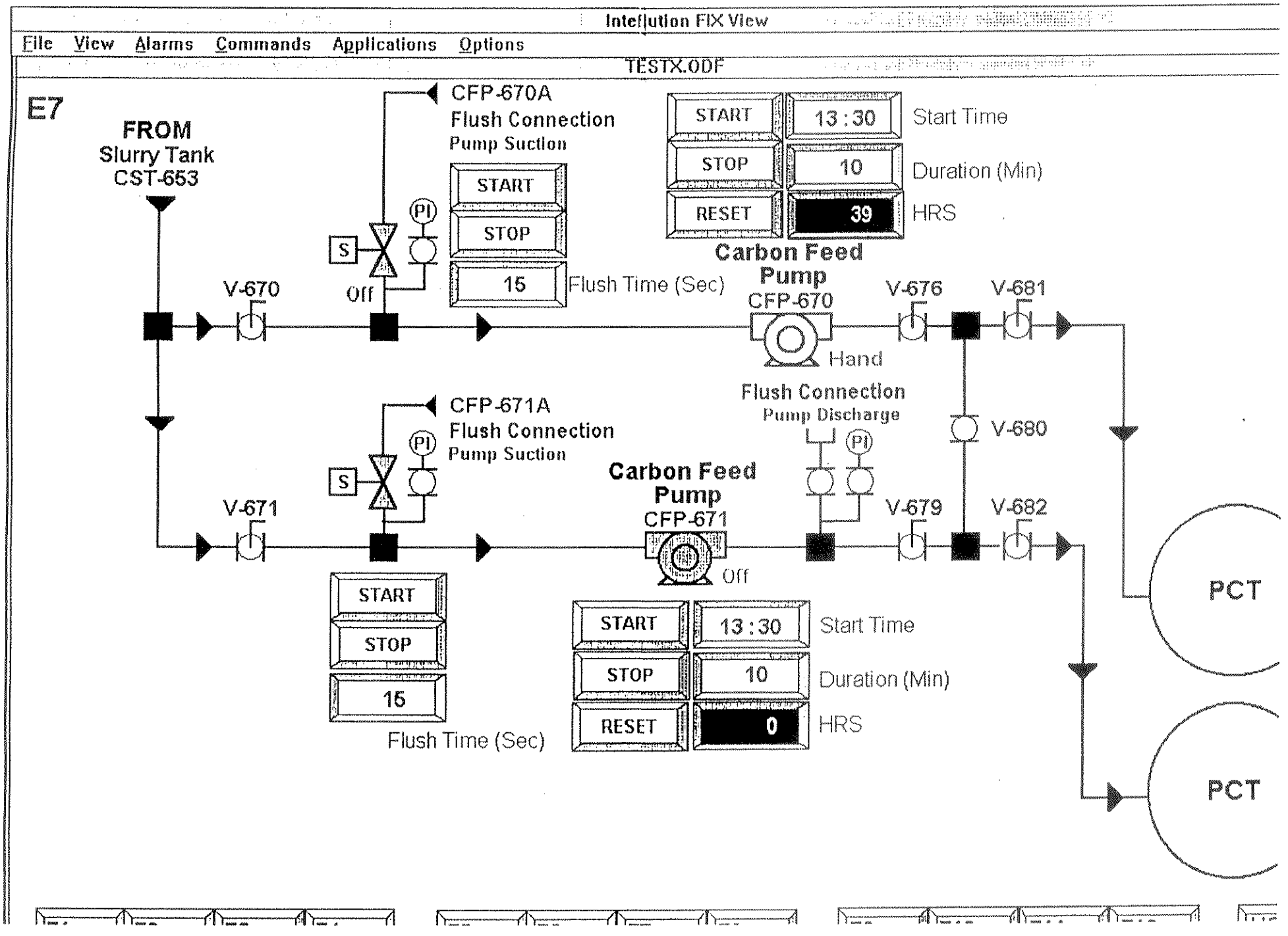
AUTO

TP-511

VALVE MOV- 511C

PID Gain	1.0	0.1 - 5.0
PID Reset Time	1	1 - 50 / MIN.
PID Dead Band	1	INCHES
	0.0	% Output in Manual
		% Output in Auto

MANUAL


Intellution FIX View
File View Alarms Commands Applications Options
TESTX.ODF
E7
FROM
Slurry Tank
CST-653
CFP-670A
Flush Connection
Pump Suction
START
STOP
15
Flush Time (Sec)
PI
S
Off
V-670
START
STOP
RESET
13 : 30
10
39
Start Time
Duration (Min)
HRS
Carbon Feed
Pump
CFP-670
Hand
V-676
V-681
Flush Connection
Pump Discharge
V-680
CFP-671A
Flush Connection
Pump Suction
Carbon Feed
Pump
CFP-671
Off
V-671
V-679
V-682
START
STOP
15
Flush Time (Sec)
START
STOP
RESET
13 : 30
10
0
Start Time
Duration (Min)
HRS
PCT
PCT

Intellution FIX View

File View Alarms Commands Applications Options

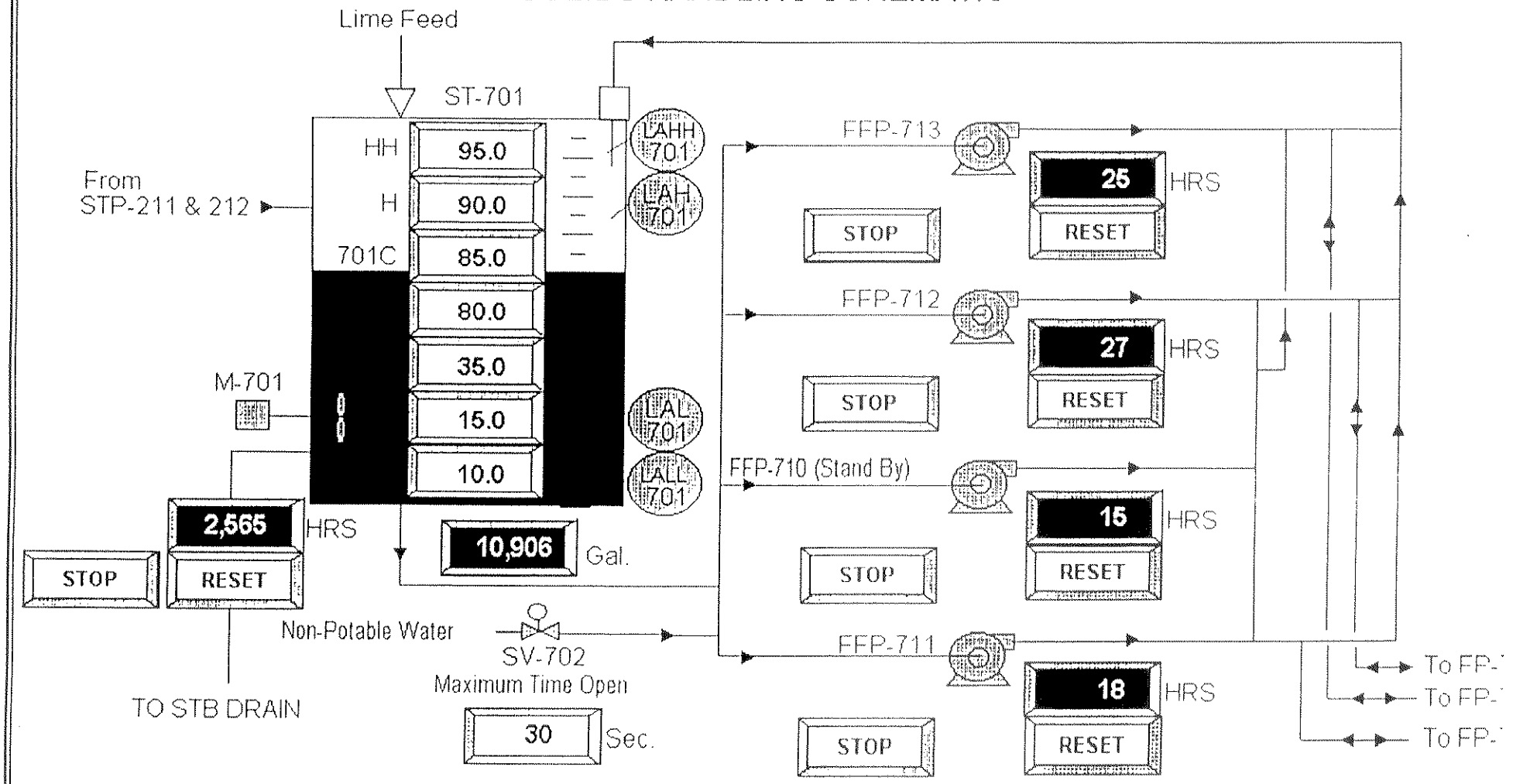
SOLIDSA.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
√	13:46:22	13:46:22	OIU	G1DIUP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

F1

SOLIDS HANDLING SCHEMATIC



Intellution FIX View

File View Alarms Commands Applications Options

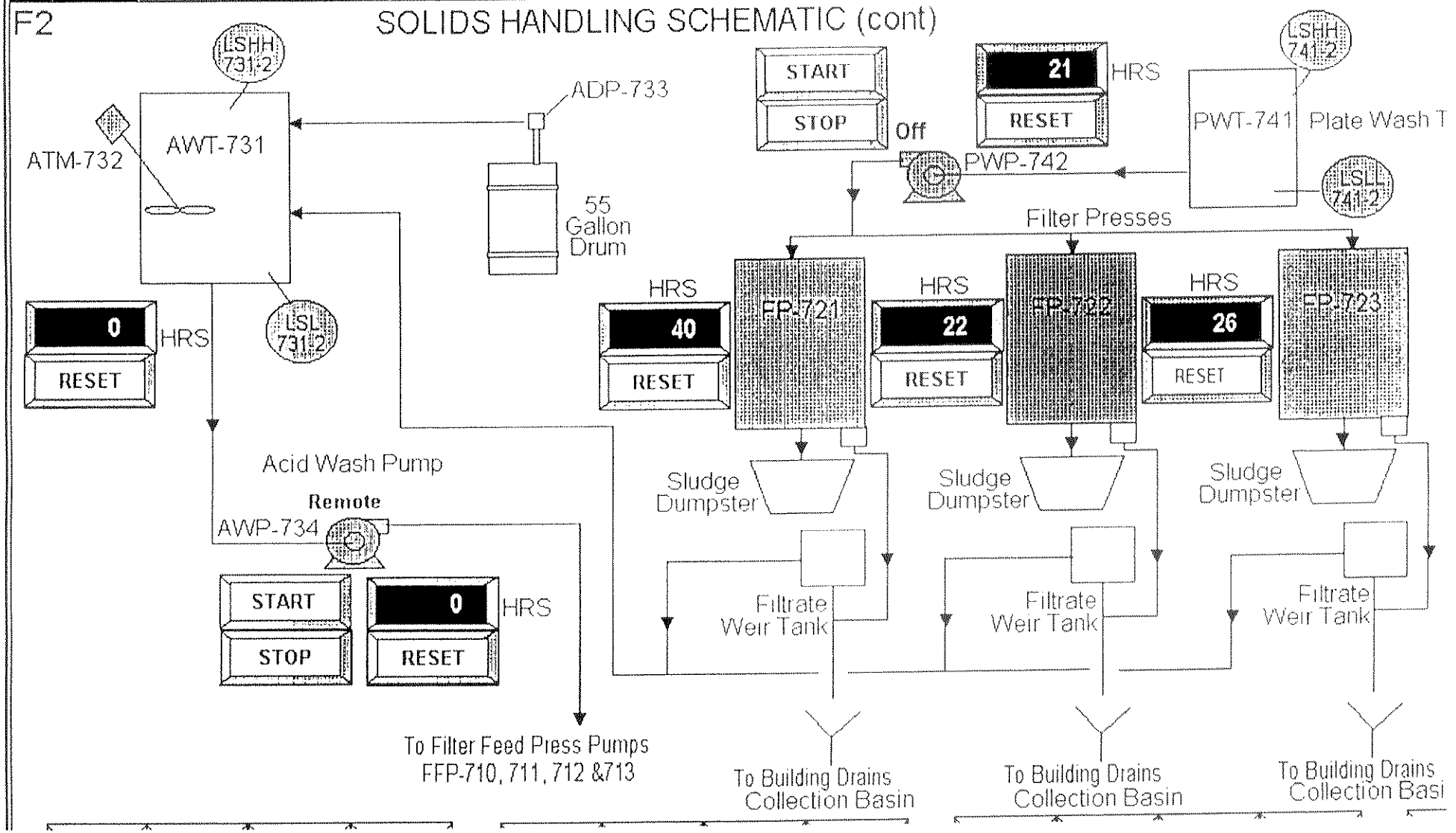
SOLIDSB.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	09:39:26	09:39:26	OIU	G1DIWP9L_	CFN		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4

F2

SOLIDS HANDLING SCHEMATIC (cont)



Intellution FIX View

File View Alarms Commands Applications Options

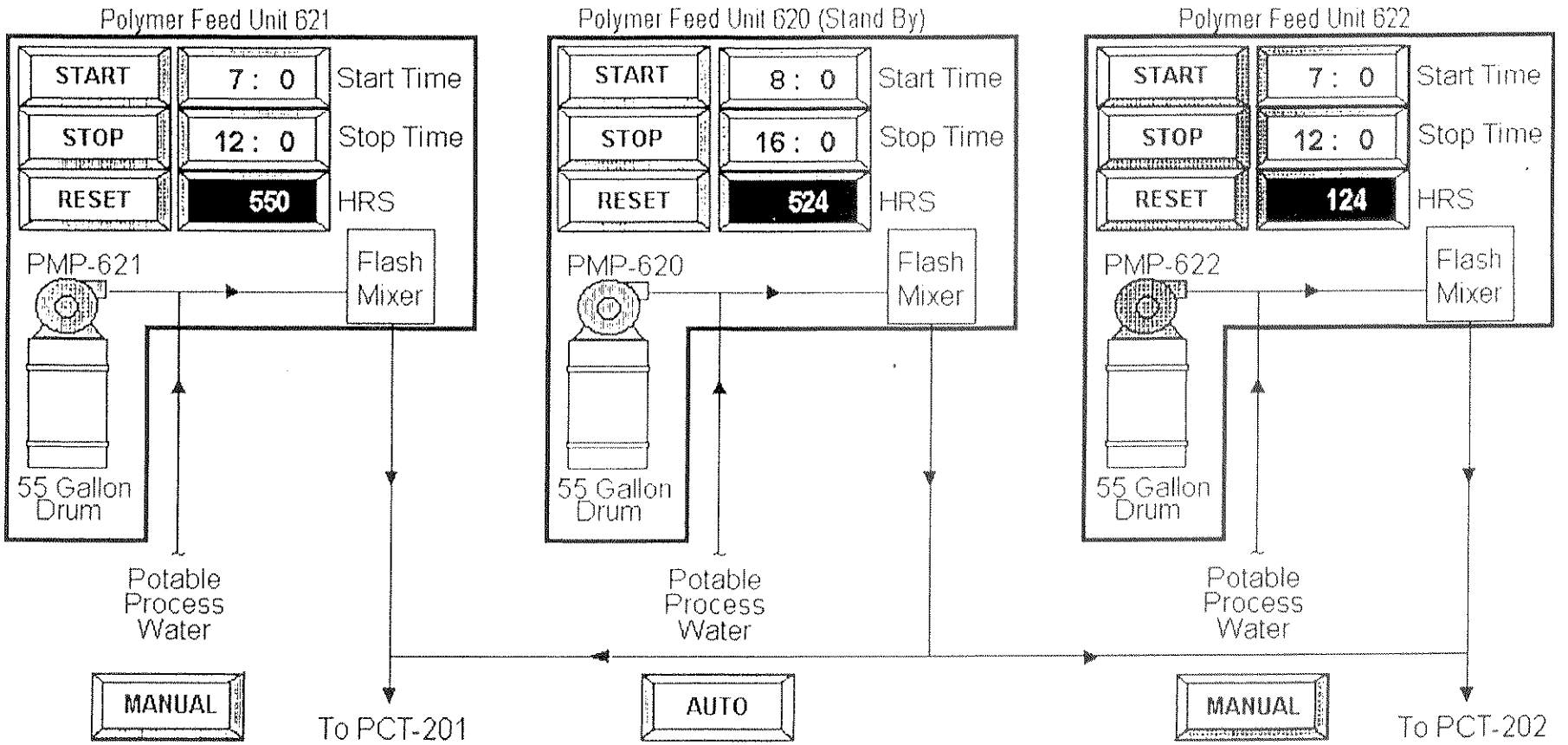
POLYMER.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	09:39:26	09:39:26	OIU	G1DIWP9L_	CFN		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4

F3

POLYMER FEED



Intellution FIX View

File View Alarms Commands Applications Options

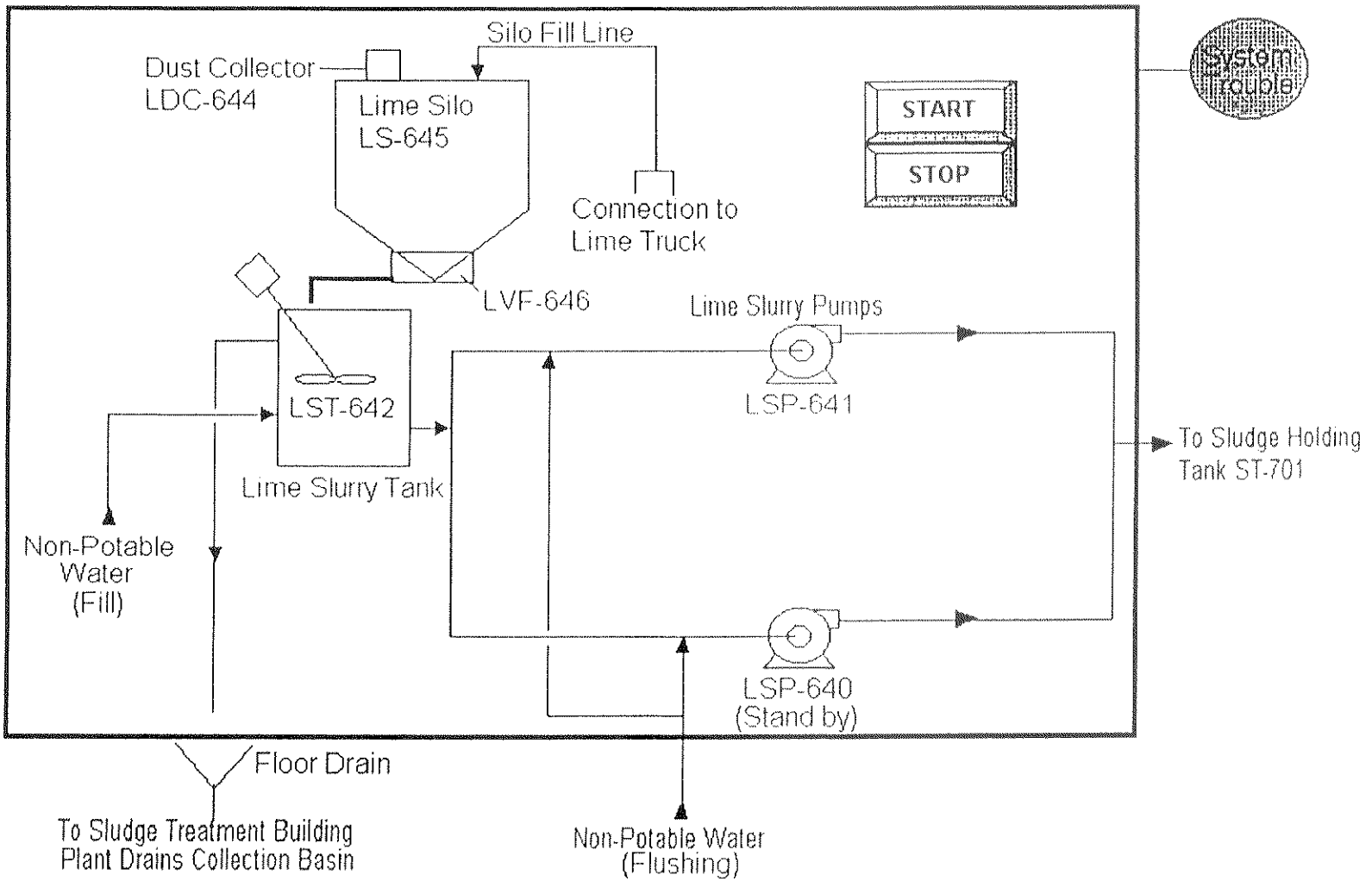
LIMEFEED.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	09:39:26	09:39:26	OIU	G1DIWP9L_	CFN		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4

F4

LIME FEED SYSTEM LFS-645



Intellution FIX View

File View Alarms Commands Applications Options

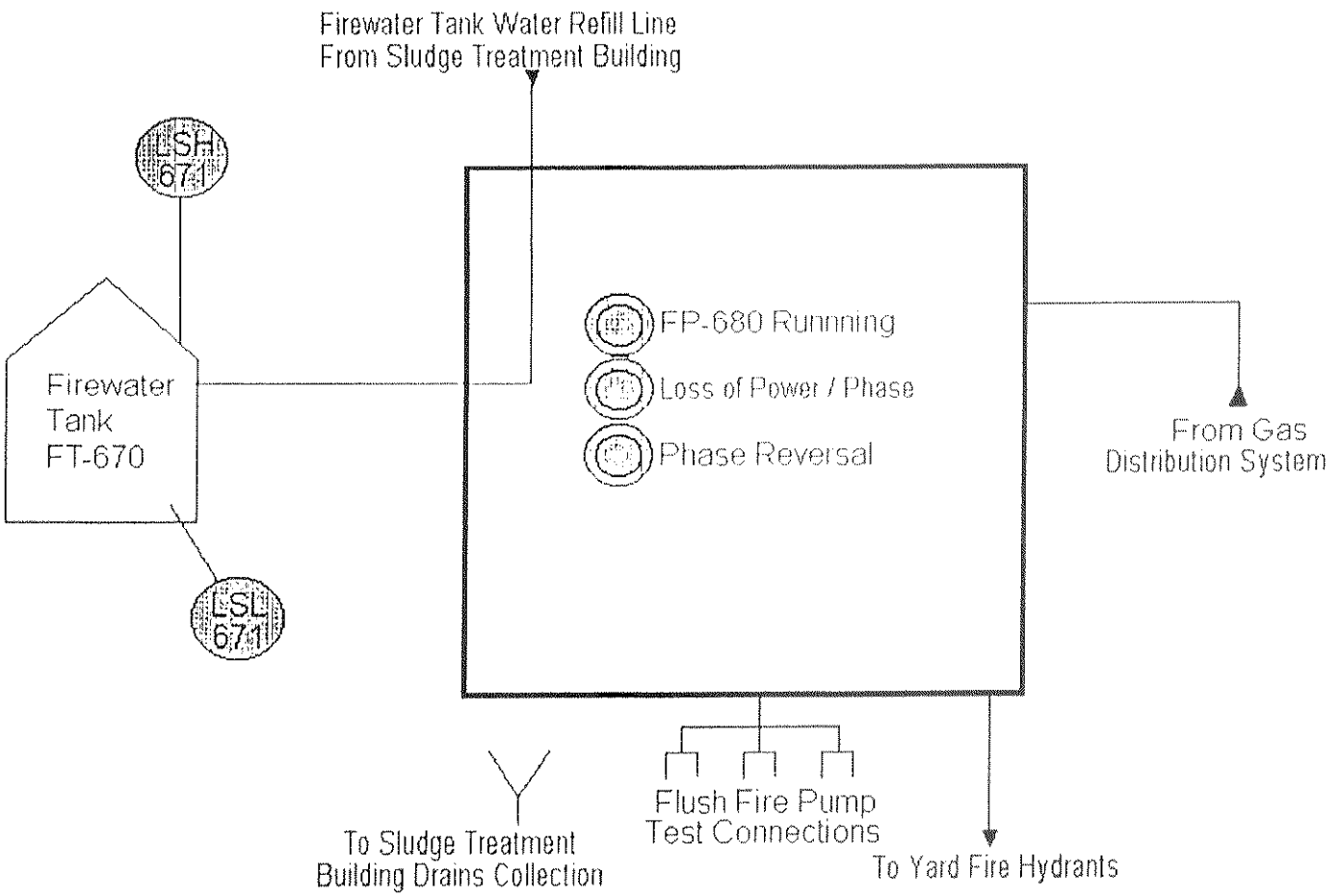
FIRWATSY.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
√	09:39:26	09:39:26	OIU	GIDIWP9L_	CFN		Alarm Low Level Alarm EW-9

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 4

F5

FIREWATER SYSTEM



Intellution FIX View

File View Alarms Commands Applications Options

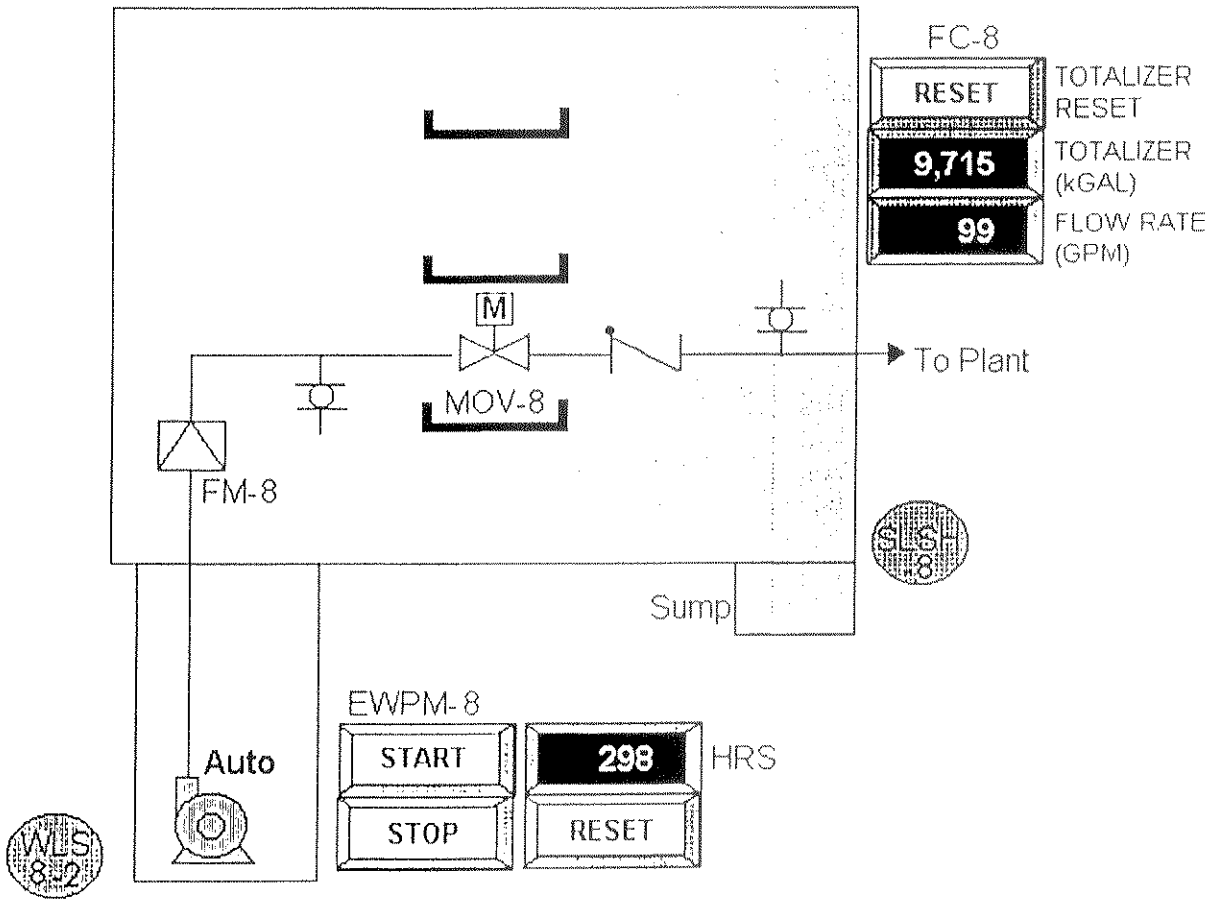
VAULT.ODF

ACK	TIME IN	TIME LST	MODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

G1

EXTRACTION WELL & VAULT - 8



Intellution FIX View

File View Alarms Commands Applications Options

CIRCBRKS.ODF

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	G1DIWP4L_	CFN		Alarm Low Level Alarm EW-4

NEW | Filter: ON | Sort: TIME | Columns | Delete ALL | Total: 3

H1

POWERLOGIC BREAKER STATUS

Main Switchgear

Feeder Breaker 1A BB Sub. 100	Feeder Breaker 4A Spare	Control Power Transformer Drawer / Potential Transformers Drawer	ATS & Low Voltage Distribution Panelboard	Control Power Transformer Drawer / Potential Transformers Drawer	Feeder Breaker 4B Spare	Feeder Breaker 1B BB Sub. 100
Feeder Breaker 2A STB Sub. 200	Feeder Breaker 3A GTB Sub. 300	MAIN Breaker A	Tie Breaker	MAIN Breaker B	Feeder Breaker 3B GTB Sub. 300	Feeder Breaker 2B STB Sub. 200

Substation 100

100 - A	MAIN Breaker 100 and Metering Comp.
100 - B	
100 - C	
100 - D	

Substation 200

200 - A	MAIN Breaker 200 and Metering Comp.
200 - B	
200 - C	
200 - D	

Substation 300

300 - A	MAIN Breaker 300 and Metering Comp.
300 - B	
300 - C	
300 - D	

Press Ctrl-Esc to access the Windows Tasklist to locate Powerlogic software.

Intellution FIX View

File View Alarms Commands Applications Options

ALARM.ODF

ALARM SUMMARY

ACK	TIME IN	TIME LST	NODE	TAGNAME	STATUS	VALUE	DESCRIPTION
✓	13:46:22	13:46:22	OIU	GIDIWP4L_	CFN	Alarm	Low Level Alarm EW-4
✓	10:48:33	10:48:33	OIU	I1DIESAL_	CFN	Alarm	To Auto Dialer Gen Alarm in Extract. Sys
✓	10:48:33	10:48:33	OIU	GIDIWP6L_	CFN	Alarm	Low Level Alarm EW-6

Filter: ON | Sort: TIME | Columns | Select All | Total: 3

Total # of UnAck alarms found in database

APPENDIX B

Alarm Conditions and Responses

APPENDIX B

EMERGENCY OPERATION AND RESPONSE

Alarms in the treatment plant are activated when a set point on a controller goes outside the expected range. The DCS monitors all of the communication and alerts the operator three different ways. The alarm horn is activated in the Groundwater Building unit all alarms are acknowledged. Also there is a horn on the DCS computer that is audible or can be disarmed. In each of the treatment buildings, except the TOU, there is a flashing beacon that activates during an alarm. Also the auto dialer calls out on an alarm through a preprogrammed set of numbers. (See Raco O&M manual for further information on programming this auto dialer and acknowledging alarms.) The following is a list of all alarms and the typical first response to the alarm. The alarm relays are connected as follows:

Channel 1	General Alarm Extraction System
Channel 2	Fire Alarm GTB
Channel 3	Fire Alarm STB
Channel 4	Fire Alarm BB/SPH
Channel 5	General Alarm GTB
Channel 6	General Alarm STB
Channel 7	General Alarm BB/SPH
Channel 8	Extraction System Zone 1 Leak
Channel 9	Extraction System Zone 2 Leak
Channel 10	Extraction System Zone 3 Leak
Channel 11	Valve 401 Closed
Channel 12	DAS Tank 101 High Level.
Channel 13	DAS Tank 102 High Level
Channel 14	Extraction System Zone 4 Leak

Alarm Name	Dialout on Auto Dialer	General Comments
Acid Wash High Level	Channel 6	The acid wash tank has a high water condition. Acid can be removed through the cleaning of the filter press.
Acid Wash Low Level	Channel 6	More acid need to be added to clear this alarm.
Air Compressor AC-751 General Alarm	Channel 6	Air Compressor in the STB, typical low pressure from an air leak in the line or the compressors not in the automatic mode or a valve improperly closed.
Air Compressor AC-752 General Alarm	Channel 6	Air Compressor in the STB, typical low pressure from an air leak in the line or the compressors not in the automatic mode or a valve improperly closed.
Air Compressor AC - 901 General Alarm	Channel 5	Air Compressor in the GTB, typical low pressure from an air leak in the line or the compressors not in the automatic mode or a valve improperly closed. Excessive use during the transfer of carbon from the tanker to the GAC vessel.
Air Compressor AC - 902 General Alarm	Channel 5	Air Compressor in the GTB, typical low pressure from an air leak in the line or the compressors not in the automatic mode or a valve improperly closed. Excessive use during the transfer of carbon from the tanker to the GAC vessel.
Air Compressor AC - 903 General Alarm	Channel 7	Air Compressor in the Blower Building, typical low pressure from an air leak in the line or the compressors not in the automatic mode or a valve improperly closed.
Air Dryer AD - 904 General Alarm	Channel 7	Air Dryer in the Blower Building
ASB-220 Compressor Trouble	Channel 7	The air compressor has 10 alarms associated with the system. They are listed below. Each of those alarms has a separate response. See Ingersol O&M manual for more information.
ASB-221 Compressor Trouble	Channel 7	see above for ASB-220
ASB-222 Compressor Trouble	Channel 7	see above for ASB-220
Channel 1 Drop 1 Error (CC-301)		This indicates a communication error between the PLC and the DCS processors. Typically the PLC need to be put back into the run mode.
Channel 1 Drop 2 Error (CC-201)		This indicates a communication error between the PLC and the DCS processors. Typically the PLC need to be put back into the run mode.
Channel 1 Drop 3 Error (CC-301)		This indicates a communication error between the PLC and the DCS processors. Typically the PLC need to be put back into the run mode.
Channel 1 Drop 4 Error (CC-101)		This indicates a communication error between the PLC and the DCS processors. Typically the PLC need to be put back into the run mode.

Alarm Name	Dialout on Auto Dialer	General Comments
Channel 1 Drop 5 Error (CC-101)		This indicates a communication error between the PLC and the DCS processors. Typically the PLC need to be put back into the run mode.
Channel 2 Drop 1 Error (CC-2)		This indicates a communication error between the PLC and the DCS processors. Typically the PLC need to be put back into the run mode.
Channel 2 Drop 2 Error (CC-1)		This indicates a communication error between the PLC and the DCS processors. Typically the PLC need to be put back into the run mode.
Control Cabinet CC1 Intrusion	Channel 1	When the door to the control cabinet is opened then the alarm sounds. Both at the DCS system and at the remote panel. (There is a 30 second delay on the remote panel) There is a switch in the cabinet that will de-activate the audible horn at the local control panel if the door remains open. Even with this switch in the de-activate mode the alarm for intrusion sounds at the DCS system.
Control Cabinet CC2 Intrusion		see above for CC-1
DAS Tank 101 High Level	Channel 12	The tank is about to overflow. Depending on the air flow to the DAS tank the flow through one train is around 650 gpm. There is typically 100 gpm recycle coming from the GTB, 20 gpm from the TOU and the recycle from the STB can be as much as 300 gpm. Flow have to be reduced from the wells to prevent the overflow of the tank into the containment area. The containment area is pumped down with the air diaphragm pump in the blower building.
DAS Tank 102 High Level	Channel 13	see comments above for 101
Splitter Box High Level	Channel 7	see comments above for 101
DB-120 Compressor Trouble	Channel 7	see above for ASB-220
DB-121 Compressor Trouble	Channel 7	see above for ASB-220
DB-122 Compressor Trouble	Channel 7	see above for ASB-220
Effluent Tank High Level	Channel 5	This alarm set point is adjustable through the DCS system at screen. On a high water alarm in the effluent tank the tertiary pumps are shut off.
Effluent Tank Low Level	Channel 5	This alarm set point is adjustable through the DCS system at screen. On a low level alarm the pumps for discharging water to the outfall are shut off. If no flow is put back into the tank and the alarm persists then the tank will be emptied by the non potable water booster system. If this system goes low then the mechanical seals on off the pumps in the SPH could develop problems.
Fail to call for Run (Every Pump in the treatment plant)	(varies)	If the pump shuts off without the stop being activated then the Fail to Call for Run Alarm Sounds. The pump should be checked for cause of shut down.

Alarm Name	Dialout on Auto Dialer	General Comments
Ferric Chloride Tank High Level Alarm	Channel 5	This would happen during acid delivery. Shut off the transfer from the truck.
Ferric Chloride Tank Low Level Alarm	Channel 5	Shuts off the pump, more chemicals have to be ordered. See screen __ for more information
Filter Press FP-721 General Alarm	Channel 6	There are a number of alarms that activate the general filter press alarm. see JWI O&M manual for more information.
Filter Press FP-722 General Alarm	Channel 6	see above for FP-722
Filter Press FP-723 General Alarm	Channel 6	see above for FP-722
Fire Alarm BB/SPH Area	Channel 4	
Fire Alarm GTB Area Zone 1	Channel 2	
Fire Alarm GTB Area Zone 2	Channel 2	
Fire Alarm S.T.B.	Channel 3	
Firewater Pumphouse High Level	Channel 6	The tank for water storage has a high water level and water need to be lowered.
Firewater Pumphouse Low Level	Channel 6	Water should be added to the tank. Should check for a possible water fill line valve closed or the fill line frozen.
FP 680 Los of Power / Phase	Channel 6	
FP-680 Phase Reversal	Channel 6	
Freeze Protection Panel BB/SPH	Channel 7	
Freeze Protection Panel STB	Channel 6	
Leak Detection ALM-1A	Channel 8	See perm-a-lert manual for more information
Leak Detection ALM-1B	Channel 8	See perm-a-lert manual for more information
Leak Detection ALM-2A	Channel 9	See perm-a-lert manual for more information
Leak Detection ALM-2B	Channel 9	See perm-a-lert manual for more information
Leak Detection ALM-3A	Channel 10	See perm-a-lert manual for more information
Leak Detection ALM-3B	Channel 10	See perm-a-lert manual for more information
Lime Feed System Package General	Channel 6	
Low Level EW-1	Channel 1	Shuts off the extraction well pump. There is a sensor lowered into the sounding type of the well and if this senses a low water level then the alarm is activated. False reading can be verified by taking a static level reading at the sounding tube and verifying the level of the water. When the water level comes back up in the well the pump automatically starts, assuming that it is still in auto. Excessive cycling of the pump should be watched and the wells cleaned when this starts to happen.
Low Level EW-2	Channel 1	see above for EW-1
Low Level EW-3	Channel 1	see above for EW-1
Low Level EW-4	Channel 1	see above for EW-1
Low Level EW-5	Channel 1	see above for EW-1
Low Level EW-6	Channel 1	see above for EW-1
Low Level EW-7	Channel 1	see above for EW-1
Low Level EW-8	Channel 1	see above for EW-1
Low Level EW-9	Channel 1	see above for EW-1

Alarm Name	Dialout on Auto Dialer	General Comments
High Level EW-1	Channel 1	Water tends to leak into the vault during rain storms and sets off the high water alarm. This has to be pumped out of the well to clear the alarm.
High Level EW-2	Channel 1	see above for EW-1
High Level EW-3	Channel 1	see above for EW-1
High Level EW-4	Channel 1	see above for EW-1
High Level EW-5	Channel 1	see above for EW-1
High Level EW-6	Channel 1	see above for EW-1
High Level EW-7	Channel 1	see above for EW-1
High Level EW-8	Channel 1	see above for EW-1
High Level EW-9	Channel 1	see above for EW-1
High High Level EW-1	Channel 1	This alarm is to anticipate a catastrophic failure in the piping within the vault. It shuts off the pump because it is assumed that there is a pipe break. The water has to be pumped out and the piping repaired to clear the alarm and run the pump.
High High Level EW-2	Channel 1	see above for EW-1
High High Level EW-3	Channel 1	see above for EW-1
High High Level EW-4	Channel 1	see above for EW-1
High High Level EW-5	Channel 1	see above for EW-1
High High Level EW-6	Channel 1	see above for EW-1
High High Level EW-7	Channel 1	see above for EW-1
High High Level EW-8	Channel 1	see above for EW-1
High High Level EW-9	Channel 1	see above for EW-1
NFT Tank inlet Valve 410 Closed	Channel 5	Shuts Down Extraction Wells that are in automatic
Non Potable Water Booster Low Pressure	Channel 5	There are three pumps that come on lead and lag pressure demand. The lead pump is not changeable. The lag pumps can be alternated. If the is a high demand in the system for water then the pumps can not keep up the alarm will sound. If there is a failure with one of the pumps then the alarm will sound.
NPDES High pH alarm	Channel 5	The permit limit for the facility is 9.0
PCT-201 General Alarm	Channel 7	If the clarifier drive for the first stage clarifier activates then the alarm will sound. There is a torque gauge in the inside of the dome to assist the operator in monitoring the torque of the drive. If the high torque is from high sludge blankets then the sludge need to be removed from the clarifier.
PCT-202 General Alarm	Channel 7	see above for PCT-201
Phosphoric Acid Tank High Level Alarm	Channel 5	This would happen during acid delivery. Shut off the transfer from the truck.
Phosphoric Acid Tank Low Level Alarm	Channel 5	Shuts off the pump, more chemicals have to be ordered. See screen __ for more information

Alarm Name	Dialout on Auto Dialer	General Comments
Plate Wash High Level	Channel 6	The pate wash tank has a high water condition. Acid can be removed through the cleaning of the filter press.
Plate Wash Low Level	Channel 6	More water needs to be added to clear this alarm.
Sewage Sump Pump High Level	Channel 5	If the toilet is flushed to much the pump can not keep up and the alarm will sound. If there is a blockage in the discharge line from the pump or the pump is not pumping then the alarm will also sound. The problem needs to be corrected to clear the alarm.
Sludge Holding Tank High High Level	Channel 6	This alarm set point is adjustable through the DCS system at screen
Sludge Holding Tank High Level	Channel 6	This alarm set point is adjustable through the DCS system at screen
Sludge Holding Tank Low Level	Channel 6	This alarm set point is adjustable through the DCS system at screen
Sludge Holding Tank Low Low Level	Channel 6	This alarm set point is adjustable through the DCS system at screen
Sump High Level GTB	Channel 5	I the flow to the sump exceeds the capacity to pump out of the sump then the alarm sounds. This can happen during the backwash of the GAC's and the alarm should be given time and it will clear on its own. If the pumps fails to pump the expected capacity the alarm will sound and the operator should clear the blockage of the pump.
Sump High Level STB	Channel 6	I the flow to the sump exceeds the capacity to pump out of the sump then the alarm sounds. This can happen during operation of the filter press should be given time and it will clear on its own. If the pumps fails to pump the expected capacity the alarm will sound and the operator should clear the blockage of the pump.
Tertiary Flow Less than 100 gpm	Channel 5	The flow rate on the pumps is monitored and alarms below 100 gpm. Damage is caused to the pumps at flow rates less than 480 gpm. If the process flow through the treatment plant is lower that 480 gpm then the blue 10" recycle line should be installed to increase the flow on the tertiary and effluent pumps. Effluent flow is not read at the higher flows because the recycle flow is not metered.
Tertiary Tank High Level	Channel 5	This alarm set point is adjustable through the DCS system at screen
Tertiary Tank Low Level	Channel 5	This alarm set point is adjustable through the DCS system at screen
Thermal Oxidation Emergency Alarm	Channel 7	Shuts Down Extraction Wells that are in automatic. The list of alarms that trigger this can be found in the detailed operating section of this manual

Alarm Name	Dialout on Auto Dialer	General Comments
Thermal Oxidation General Alarm	Channel 7	The unit continues to run, however a general alarm will usually lead to a later emergency alarm. The list of alarms that trigger this can be found in the detailed operating section of this manual.
Vault Sump High High Level VV-1	Channel 1	Water tends to leak into the vault during rain storms and sets off the high water alarm. The water should be pumped out prior to setting of the high high alarm. This has to be pumped out of the well to clear the alarm. All wells are shut down in this zone on this alarm presuming a leak in the piping.
Vault Sump High High Level VV-2	Channel 1	see above for VV-1
Vault Sump High High Level VV-3	Channel 1	see above for VV-1
Vault Sump High Level VV-1	Channel 1	Water tends to leak into the vault during rain storms and sets off the high water alarm. This has to be pumped out of the well to clear the alarm.
Vault Sump High Level VV-2	Channel 1	see above for VV-1
Vault Sump High Level VV-3	Channel 1	see above for VV-1

APPENDIX C

Treatment Facility Valve Schedule

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE

WELL VAULTS

EW-GRD-1	GRD H20	Discharge-EW1	4" butterfly	GREEN	ROUND
EW-GRD-2	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-3	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-4	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-5	GRD H20	Discharge-EW2	4" butterfly	GREEN	ROUND
EW-GRD-6	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-7	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-8	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-9	GRD H20	Discharge-EW3	4" butterfly	GREEN	ROUND
EW-GRD-10	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-11	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-12	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-13	GRD H20	Discharge-EW4	4" butterfly	GREEN	ROUND
EW-GRD-14	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-15	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-16	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-17	GRD H20	Discharge-EW5	4" butterfly	GREEN	ROUND
EW-GRD-18	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-19	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-20	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-21	GRD H20	Discharge-EW6	4" butterfly	GREEN	ROUND
EW-GRD-22	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-23	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-24	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-25	GRD H20	Discharge-EW7	4" butterfly	GREEN	ROUND
EW-GRD-26	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-27	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-28	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-29	GRD H20	Discharge-EW8	4" butterfly	GREEN	ROUND
EW-GRD-30	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-31	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-32	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-33	GRD H20	Discharge-EW9	4" butterfly	GREEN	ROUND
EW-GRD-34	GRD H20	Discharge-MOV	4" butterfly	GREEN	ROUND
EW-GRD-35	GRD H20	Relief port	3/4" ball	GREEN	ROUND
EW-GRD-36	GRD H20	Discharge pressure gauge	1" ball	GREEN	ROUND
EW-GRD-37	GRD H20	Discharge-EW10	4" butterfly	GREEN	ROUND
EW-GRD-38	GRD H20	Discharge-MOV	2" butterfly	GREEN	ROUND
EW-GRD-39	GRD H20	Discharge pressure gauge	3/4" ball	GREEN	ROUND
EW-GRD-40	GRD H20	Auxillary Valve	1"	GREEN	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
EW-GRD-41	GRD H20	Auxillary Valve	2"	GREEN	ROUND
EW-GRD-42	GRD H20	Discharge Check Valve	2"	GREEN	ROUND
EW-GRD-43	GRD H20	Leak detect.shutoff (lk.det.vault)	4" ball	GREEN	ROUND
EW-GRD-44	GRD H20	Leak detect.shutoff (lk.det.vault)	4" butterfly	GREEN	ROUND
EW-SP-1	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-2	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-3	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-4	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-5	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-6	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-7	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-8	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-9	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
EW-SP-10	SMPL PORT	Discharge sample port	3/4" butterfly	ORANGE	SQUARE
VV-GRD-1	GRD H20	Influent-VV1-line E	8" butterfly	GREEN	ROUND
VV-GRD-2	GRD H20	Influent-VV1-line F	8" butterfly	GREEN	ROUND
VV-GRD-3	GRD H20	Purge port-line F-before 8"valve	3" ball	GREEN	ROUND
VV-GRD-4	GRD H20	Purge port-line E-before 8"valve	3" ball	GREEN	ROUND
VV-GRD-5	GRD H20	Purge port-line E-after 8"valve	3" ball	GREEN	ROUND
VV-GRD-6	GRD H20	Purge port-line F-after 8"valve	3" ball	GREEN	ROUND
VV-GRD-7	GRD H20	Influent-VV2-line E	8" butterfly	GREEN	ROUND
VV-GRD-8	GRD H20	Influent-VV2-line F	8" butterfly	GREEN	ROUND
VV-GRD-9	GRD H20	Bypass-off line E	3" butterfly	GREEN	ROUND
VV-GRD-10	GRD H20	Bypass-off line F	3" butterfly	GREEN	ROUND
VV-GRD-11	GRD H20	Purge port-line E-before 8"valve	3" ball	GREEN	ROUND
VV-GRD-12	GRD H20	Purge port-line F-before 8"valve	3" ball	GREEN	ROUND
VV-GRD-13	GRD H20	Purge port-line E-after 8"valve	3" ball	GREEN	ROUND
VV-GRD-14	GRD H20	Purge port-line F-after 8"valve	3" ball	GREEN	ROUND
VV-GRD-14A	GRD H20	Purge port-EW-7 line	3" ball	GREEN	ROUND
VV-GRD-15	GRD H20	Influent-VV3-line E	8" butterfly	GREEN	ROUND
VV-GRD-16	GRD H20	Influent-VV3-line F	8" butterfly	GREEN	ROUND
VV-GRD-17	GRD H20	Bypass-middle of E/F	6" butterfly	GREEN	ROUND
VV-GRD-18	GRD H20	Bypass line A	6" butterfly	GREEN	ROUND
VV-GRD-19	GRD H20	Bypass line C	3" butterfly	GREEN	ROUND
VV-GRD-20	GRD H20	Purge port-line A	3" ball	GREEN	ROUND
VV-GRD-21	GRD H20	Purge port-line B	2" ball	GREEN	ROUND
VV-GRD-22	GRD H20	Purge port-line C	2" ball	GREEN	ROUND
VV-GRD-23	GRD H20	Purge port-line E-before 8"valve	3" ball	GREEN	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
VV-GRD-24	GRD H20	Purge port-line F-before 8"valve	3" ball	GREEN	ROUND
VV-GRD-25	GRD H20	Purge port-line E-after 8"valve	3" ball	GREEN	ROUND
VV-GRD-26	GRD H20	Purge port-line F-after 8"valve	3" ball	GREEN	ROUND
VV-GRD-27	GRD H20	VV3-Intl. EW1-3	3" ball	GREEN	ROUND
VV-GRD-28	GRD H20	VV3-Intl. EW4-5	3" ball	GREEN	ROUND

AIR STRIPPER BASIN

V-101A	GRD H20	Bypass-DAS101	8" butterfly	GREEN	ROUND
V-101C	GRD H20	Effluent DAS-101-at tank	3" butterfly	GREEN	ROUND
V-102A	GRD H20	Bypass-DAS102	8" butterfly	GREEN	ROUND
V-102B	GRD H20	Bypass-DAS102	8" butterfly	GREEN	ROUND
V-102C	GRD H20	Effluent DAS-102-at tank	8" butterfly	GREEN	ROUND
V-103B	GRD H20	Bypass to Effluent 102	8" butterfly	GREEN	ROUND
V-103C	GRD H20	Influent-Remote Wells	8" butterfly	GREEN	ROUND
V-104A	GRD H20	Effluent-splitter box bypass	8" butterfly	GREEN	ROUND
V-104B	GRD H20	DAS/Splitter box bypass	8" butterfly	GREEN	ROUND
V-105	GRD H20	Influent-Remote Wells	8" butterfly	GREEN	ROUND
V-106	GRD H20	Influent EW8-9	4" butterfly	GREEN	ROUND
V-109	GRD H20	Influent-Splitter box	8" butterfly	GREEN	ROUND
V-110	GRD H20	Bypass-DAS101	8" butterfly	GREEN	ROUND
V-111	GRD H20	Effluent bypass to PCT-202	8" butterfly	GREEN	ROUND
V-112	GRD H20	Effluent to PCT 201	8" butterfly	GREEN	ROUND
V-117	GRD H20	Effluent DAS to NFT-401	8" butterfly	GREEN	ROUND
DAS-GW-1	GRD H20	Tank drain DAS-101	4" butterfly	GREEN	ROUND
DAS-GW-2	GRD H20	Tank drain DAS-102	4" butterfly	GREEN	ROUND
DAS-GW-3	GRD H20	Relief port top of EW-10 Influ.	3/4" ball	GREEN	ROUND
V-201A	TRD RECYCLE	Influent-plant recycle	8" butterfly	RED	ROUND
DAS-TW-1	TRD RECYCLE	Influent- GTB recycle	3" butterfly	RED	ROUND
DAS-TW-2	TRD RECYCLE	Influent-STB recycle	6" butterfly	RED	ROUND

DAS-GW-1	GW RECYCLE	Influent-DAS sump recycle	3" butterfly	RED	ROUND

DAS-CW-1	CORR. WASTE	Influent-corrosive H20	1 1/2" ball	RED	ROUND

V-107	SMPL PORT	Before 102A	3/4" ball	ORANGE	SQUARE
V-108	SMPL PORT	Between V-110/V-101A	3/4" ball	ORANGE	SQUARE
V-113	SMPL PORT	Sample port #1	3/4" ball	ORANGE	SQUARE
V-114	SMPL PORT	At V-111	3/4" ball	ORANGE	SQUARE
V-115	SMPL PORT	At V-105	3/4" ball	ORANGE	SQUARE
V-116	SMPL PORT	Sample at V-106	3/4" ball	ORANGE	SQUARE
DAS-SP-1	SMPL PORT	Sample port #2-before PCT201	3/4" ball	ORANGE	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
DAS-SP-2	SMPL PORT	Sample port #3-before PCT202	3/4" ball	ORANGE	SQUARE
DAS-SP-3	SMPL PORT	Sample port for EW-10 at infl.	3/4" ball	ORANGE	SQUARE
V-801	OFF GAS	Off gas from DAS-101	18" butterfly	ORANGE	ROUND
V-802	OFF GAS	Off gas from DAS-102	18" butterfly	ORANGE	ROUND
V-803	OFF GAS	Off gas at gooseneck-DAS 101	18" butterfly	ORANGE	ROUND
V-804	OFF GAS	Off gas at gooseneck-DAS 102	18" butterfly	ORANGE	ROUND

POWDERED ACTIVATED CARBON TANKS

V-201A	GRD H20	Influent-PCT 201	10" butterfly	GREEN	ROUND
V-202A	GRD H20	Influent-PCT 201	10" butterfly	GREEN	ROUND

PCT-GRD-1	SMPL PORT	Influent-sample port -PCT201	3/4" ball	ORANGE	SQUARE
PCT-GRD-2	SMPL PORT	Influent-sample port-PCT202	3/4" ball	ORANGE	SQUARE
V-301	SMPL PORT	Effluent-sample port #8-C301	3/4" ball	ORANGE	SQUARE
V-302	SMPL PORT	Effluent-sample port #9-C302	3/4" ball	ORANGE	SQUARE

V-201B	PHOS. ACID	Influent to PCT201	1" ball	PURPLE	ROUND
V-202B	PHOS. ACID	Influent to PCT202	1" ball	PURPLE	ROUND
PCT-PM-1	POLYMER	Influent-PCT301	1" ball	PURPLE	ROUND
PCT-PM-2	POLYMER	Influent-PCT302	1" ball	PURPLE	ROUND

PCT - 201

PCT-CA-1	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-2	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-3	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-4	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-5	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-6	COMP. AIR	Supply-at header 2nd stage	6" butterfly	DARK BLUE	SQUARE
PCT-CA-7	COMP. AIR	Supply-at header 2nd stage	6" butterfly	DARK BLUE	SQUARE
PCT-CA-8	COMP. AIR	Supply-at header 2nd stage	6" butterfly	DARK BLUE	SQUARE
PCT-CA-9	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-10	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-11	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-12	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-13	COMP. AIR	Supply-6" main header	6" butterfly	DARK BLUE	SQUARE
PCT-CA-14	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE
PCT-CA-15	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE
PCT-CA-16	COMP. AIR	Supply-8" main header	8" butterfly	DARK BLUE	SQUARE
PCT-CA-17	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE
PCT-CA-18	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE

PCT - 202

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
PCT-CA-19	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
		PCT - 202 (cont'd.)			
PCT-CA-20	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-21	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-22	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-23	COMP. AIR	Supply-at header 1st stage	8" butterfly	DARK BLUE	SQUARE
PCT-CA-24	COMP. AIR	Supply-at header 2nd stage	6" butterfly	DARK BLUE	SQUARE
PCT-CA-25	COMP. AIR	Supply-at header 2nd stage	6" butterfly	DARK BLUE	SQUARE
PCT-CA-26	COMP. AIR	Supply-at header 2nd stage	6" butterfly	DARK BLUE	SQUARE
PCT-CA-27	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-28	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-29	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-30	COMP. AIR	Supply-at header digester	4" butterfly	DARK BLUE	SQUARE
PCT-CA-31	COMP. AIR	Supply-6" main header	6" butterfly	DARK BLUE	SQUARE
PCT-CA-32	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE
PCT-CA-33	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE
PCT-CA-34	COMP. AIR	Supply-8" main header	8" butterfly	DARK BLUE	SQUARE
PCT-CA-35	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE
PCT-CA-36	COMP. AIR	Valve off 'T' to pressure gauge	1" ball	DARK BLUE	SQUARE
PCT-TRD-1	TRD H20	Effluent-C301	14" gate	BROWN	ROUND
PCT-TRD-2	TRD H20	Effluent-C302	14" gate	BROWN	ROUND
PCT-SL-1	SLUDGE	Sludge draw off - PCT 201	8" butterfly	BLACK	ROUND
PCT-SL-2	SLUDGE	Sludge draw off - PCT 202	8" butterfly	BLACK	ROUND
PCT-SL-3	SLUDGE	Influent-carbon-PCT201	3" butterfly	BLACK	ROUND
PCT-SL-4	SLUDGE	Influent-carbon-PCT202	3" butterfly	BLACK	ROUND
PCT-SL-5	SLUDGE	Influent-carbon-PCT201	1" ball	BLACK	ROUND
PCT-SL-6	SLUDGE	Influent-carbon-PCT202	1" ball	BLACK	ROUND
CLR-SC-1	SCUM	Scum line discharge-C301	3/4" globe	BLACK	ROUND
CLR-SC-2	SCUM	Scum line discharge-C302	3/4" globe	BLACK	ROUND

BLOWER BUILDING

BB-G-1	NAT. GAS	GUH-977A	3/4" backflow	YELLOW	ROUND
BB-G-2	NAT. GAS	GUH-977B	3/4" backflow	YELLOW	ROUND
BB-G-3	NAT. GAS	GUH-977C	3/4" backflow	YELLOW	ROUND
BB-G-4	NAT. GAS	GUH-977D	3/4" backflow	YELLOW	ROUND
BB-G-5	NAT. GAS	Outside main	1-1/2" bckflow	YELLOW	ROUND
BB-G-6	NAT. GAS	Inside main	1-1/4" bckflow	YELLOW	ROUND
V-130A	OFF GAS	Inlet DF-130 from 201	10" butterfly	ORANGE	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
V-130B	OFF GAS	Inlet DF-130 from 202	10" butterfly	ORANGE	ROUND
V-130C	OFF GAS	Outlet DF-130 to DAS 101	10" butterfly	ORANGE	ROUND
V-130D	OFF GAS	Outlet DF-130 to DAS 102	10" butterfly	ORANGE	ROUND
V-130E	OFF GAS	Inlet DF-130 both	10" butterfly	ORANGE	ROUND
V-131A	OFF GAS	Inlet-DF-131	10" butterfly	ORANGE	ROUND
V-131B	OFF GAS	Outlet DF-131	10" butterfly	ORANGE	ROUND
V-132A	OFF GAS	Inlet DF-132	10" butterfly	ORANGE	ROUND
V-132B	OFF GAS	Outlet DF-132	10" butterfly	ORANGE	ROUND
V-122A	OFF-GAS	InletDAS 122	8" butterfly	ORANGE	ROUND
V-122D	OFF GAS	Inlet DAS 122	16" butterfly	ORANGE	ROUND
BB-OG-1	OFF GAS	Inlet-DAS 122- pressure gauge	1/2" ball	ORANGE	ROUND
V-120A	OFF GAS	Inlet-DAS 120	8" butterfly	ORANGE	ROUND
V-120D	OFF GAS	Inlet-DAS 120 from PCT 202	16" butterfly	ORANGE	ROUND
V-120E	OFF GAS	Inlet-DAS 120 from PCT 201	16" butterfly	ORANGE	ROUND
BB-OG-2	OFF GAS	Inlet-DAS 120-pressure gauge	1/2" ball	ORANGE	ROUND
V-121A	OFF GAS	Inlet-DAS 121	8" butterfly	ORANGE	ROUND
V-121D	OFF GAS	Inlet-DAS 121	16" butterfly	ORANGE	ROUND
BB-OG-3	OFF GAS	Inlet-DAS 121-pressure gauge	1/2" ball	ORANGE	ROUND
V-222A	COMP. AIR	Inlet-ASB 222	8" butterfly	DARK BLUE	SQUARE
V-220A	COMP. AIR	Inlet-ASB 220	8" butterfly	DARK BLUE	SQUARE
V-221A	COMP. AIR	Inlet ASB 221	8" butterfly	DARK BLUE	SQUARE
V122B	COMP. AIR	Discharge-unload-DAS 122	4" ball	DARK BLUE	SQUARE
V-123	COMP. AIR	Discharge-DAS 122	14" butterfly	DARK BLUE	SQUARE
BB-CA-1	COMP. AIR	Discharge-sample port-DAS 122	3/4" ball	DARK BLUE	SQUARE
V-120B	COMP. AIR	Discharge-Unload- DAS 120	4" ball	DARK BLUE	SQUARE
V-124	COMP. AIR	Discharge-DAS 120 to 102	14" butterfly	DARK BLUE	SQUARE
V-125	COMP. AIR	Discharge-DAS 120 to 101	14" butterfly	DARK BLUE	SQUARE
V-121B	COMP. AIR	Discharge-Unload- DAS 121	4" ball	DARK BLUE	SQUARE
V-126	COMP. AIR	Discharge-DAS 121	14" butterfly	DARK BLUE	SQUARE
BB-CA-2	COMP. AIR	Discharge-sample port-DAS 121	3/4" ball	DARK BLUE	SQUARE
V-222B	COMP AIR	Discharge-unload ASB 222	4" ball	DARK BLUE	SQUARE
V-223	COMP. AIR	Discharge-ASB 222	14" butterfly	DARK BLUE	SQUARE
BB-CA-3	COMP. AIR	Discharge sample port ASB 222	3/4" ball	DARK BLUE	SQUARE
V-220B	COMP. AIR	Discharge-unload ASB 220	4" ball	DARK BLUE	SQUARE
V-224	COMP. AIR	Discharge to PCT 202	14" butterfly	DARK BLUE	SQUARE
V-225	COMP. AIR	Discharge to PCT 201	14" butterfly	DARK BLUE	SQUARE
V-221B	COMP. AIR	Discharge-unload ASB 221	4" ball	DARK BLUE	SQUARE
V-226	COMP. AIR	Discharge-ASB 221	14" butterfly	DARK BLUE	SQUARE
BB-CA-4	COMP. AIR	Discharge sample port ASB 221	3/4" ball	DARK BLUE	SQUARE
BB-CA-5	COMP. AIR	Air Cooler Inlet A-AC 903	1" ball	DARK BLUE	SQUARE
BB-CA-6	COMP. AIR	Air Cooler Inlet B	1" ball	DARK BLUE	SQUARE
BB-CA-7	COMP. AIR	Press. relief-side A-right cylin.	1/4" popoff	DARK BLUE	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
BB-CA-8	COMP. AIR	Press. relief-side A mid. cylin.	1/4" popoff	DARK BLUE	SQUARE
BB-CA-9	COMP. AIR	Press. relief-side A-seal air-mid.	1/4" adjusting	DARK BLUE	SQUARE
BB-CA-10	COMP. AIR	Press. relief side A-to air cooler	1/4" popoff	DARK BLUE	SQUARE
BB-CA-11	COMP. AIR	Press. relief-side B-right cylin.	1/4" popoff	DARK BLUE	SQUARE
BB-CA-12	COMP. AIR	Press. relief-side B-mid. cylin.	1/4" popoff	DARK BLUE	SQUARE
BB-CA-13	COMP. AIR	Press. relief-side B-seal air-mid.	1/4" adjusting	DARK BLUE	SQUARE
BB-CA-14	COMP. AIR	Press. relief-side B-to air cooler	1/4" popoff	DARK BLUE	SQUARE
BB-CA-15	COMP. AIR	Press. relief- tank	1/4" popoff	DARK BLUE	SQUARE
BB-CA-16	COMP. AIR	Tank pressure gauge	1/4" ball	DARK BLUE	SQUARE
BB-CA-17	COMP. AIR	Tank shut off	1-1/2" ball	DARK BLUE	SQUARE
BB-CA-18	COMP. AIR	Drain Line AC-903	3/4" ball	DARK BLUE	SQUARE
BB-CA-19	COMP. AIR	Air connec.line-before adjuster	3/4" ball	DARK BLUE	SQUARE
BB-CA-20	COMP. AIR	Air connec.line-after adjuster	3/4" ball	DARK BLUE	SQUARE
BB-CA-21	COMP. AIR	Hose connec.E. south wall	3/4" ball	DARK BLUE	SQUARE
BB-CA-22	COMP. AIR	Hose connec.W. south wall	3/4" ball	DARK BLUE	SQUARE
BB-CA-23	COMP. AIR	Diaphragm line after tank	3/4" ball	DARK BLUE	SQUARE
BB-CA-24	COMP. AIR	Diaphragm line at diaph.	3/4" ball	DARK BLUE	SQUARE
BB-CA-25	COMP. AIR	Seal air line at tank	1-1/4" ball	DARK BLUE	SQUARE
BB-CA-26	COMP. AIR	Seal air ASB 220	3/4" ball	DARK BLUE	SQUARE
BB-CA-27	COMP. AIR	Seal air ASB 221	3/4" ball	DARK BLUE	SQUARE
BB-CA-28	COMP. AIR	Seal air ASB 222	3/4" ball	DARK BLUE	SQUARE
BB-CA-29	COMP. AIR	Seal air DAS 120	3/4" ball	DARK BLUE	SQUARE
BB-CA-30	COMP. AIR	Seal air DAS 121	3/4" ball	DARK BLUE	SQUARE
BB-CA-31	COMP. AIR	Seal air DAS 122	3/4" ball	DARK BLUE	SQUARE
BB-CA-32	COMP. AIR	T.O.U. air hose line connection	3/4" ball	DARK BLUE	SQUARE
BB-CA-33	COMP. AIR	Main line to dryer	1-1/4" ball	DARK BLUE	SQUARE
BB-CA-34	COMP. AIR	Main line after dryer	1-1/4" ball	DARK BLUE	SQUARE
BB-CA-35	COMP. AIR	Dryer bypass	1-1/4" ball	DARK BLUE	SQUARE
BB-CA-36	COMP. AIR	Air Cooler Inlet 902A	1" ball	DARK BLUE	SQUARE
BB-CA-37	COMP. AIR	Air Cooler Inlet 902B	1" ball	DARK BLUE	SQUARE
BB-CA-38	COMP. AIR	Main Shut Off AC-902	1" ball	DARK BLUE	SQUARE
BB-CA-39	COMP. AIR	Condensation Drain	3/4" ball	DARK BLUE	SQUARE
BB-CA-40	COMP. AIR	Press. relief-side A-right cylin.	1/4" popoff	DARK BLUE	SQUARE
BB-CA-41	COMP. AIR	Press. relief-side A-mid. cylin.	1/4" popoff	DARK BLUE	SQUARE
BB-CA-42	COMP. AIR	Press. relief-side A-seal air -mid.	1/4" adjusting	DARK BLUE	SQUARE
BB-CA-43	COMP. AIR	Press. relief-side A-to air cooler	1/4" popoff	DARK BLUE	SQUARE
BB-CA-44	COMP. AIR	Press. relief-side B-right cylin.	1/4" popoff	DARK BLUE	SQUARE
BB-CA-45	COMP. AIR	Press. relief-side B-mid. cylin.	1/4" popoff	DARK BLUE	SQUARE
BB-CA-46	COMP. AIR	Press. relief-side B-seal air-mid.	1/4" adjusting	DARK BLUE	SQUARE
BB-CA-47	COMP. AIR	Press. relief-side B-to air cooler	1/4" popoff	DARK BLUE	SQUARE
BB-CA-48	COMP. AIR	Press. relief- tank	1/4" popoff	DARK BLUE	SQUARE
BB-CA-49	COMP. AIR	Tank pressure gauge	1/4" ball	DARK BLUE	SQUARE
BB-CA-50	COMP. AIR	AC-902 Main Line to GWTB	1 1/2" ball	DARK BLUE	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
BB-CA-51	COMP. AIR	To conden.dryer-above solenoid	1" ball	DARK BLUE	SQUARE
BB-CA-52	COMP. AIR	To condensation dryer	solenoid	DARK BLUE	SQUARE
BB-CA-53	COMP. AIR	To pressure switch at solenoid	3/4" ball	DARK BLUE	SQUARE
BB-CA-54	COMP. AIR	Bypass to condensation dryer	3/4" ball	DARK BLUE	SQUARE
BB-CA-55	COMP. AIR	AC-903 tank drain(beneath)	1/2" pepcock	DARK BLUE	SQUARE
BB-CA-56	COMP. AIR	AC-902tank drain(beneath)	1/2" pepcock	DARK BLUE	SQUARE
BB-CA-57	COMP. AIR	Volute-DAS 120 purge port	1/2" ball	DARK BLUE	SQUARE
BB-CA-58	COMP. AIR	Volute-DAS 121 purge port	1/2" ball	DARK BLUE	SQUARE
BB-CA-59	COMP. AIR	Volute-DAS 122 purge port	1/2" ball	DARK BLUE	SQUARE
BB-CA-60	COMP. AIR	Volute-ASB 220 purge port	1/2" ball	DARK BLUE	SQUARE
BB-CA-61	COMP. AIR	Volute-ASB 221 purge port	1/2" ball	DARK BLUE	SQUARE
BB-CA-62	COMP. AIR	Volute-ASB 222 purge port	1/2" ball	DARK BLUE	SQUARE
BB-GW-1	GRD H20	Inlet to diaphragm	2" ball	GREEN	ROUND
BB-GW-2	GRD H20	Inlet to diaphragm	2" ball	GREEN	ROUND
BB-GW-3	GRD H20	Inlet line purge	1" ball	GREEN	ROUND
BB-GW-4	GRD H20	Outlet to splitter/box	2" ball	GREEN	ROUND
BB-GW-5	GRD H20	Outlet to splitter/box	2" ball	GREEN	ROUND
BB-GW-6	GRD H20	Outlet line purge	3/4"ball	GREEN	ROUND
BB-GW-7	GRD H20	Inlet condensation pump	2" ball	GREEN	ROUND
BB-GW-8	GRD H20	Inlet line purge	1-1/2" ball	GREEN	ROUND
BB-GW-9	GRD H20	pump water-high level adjust.	1/2" gate	GREEN	ROUND
BB-GW-10	GRD H20	pump water low level adjust.	1/2" gate	GREEN	ROUND
BB-GW-11	GRD H20	Outlet condensation pump#1	1-1/2" ball	GREEN	ROUND
BB-GW-12	GRD H20	Outlet condensation pump#2	1"ball	GREEN	ROUND
BB-GW-13	GRD H20	Discharge purge	1" ball	GREEN	ROUND
BB-GW-14	GRD H20	Outlet to splitter/box at N. wall	2" ball	GREEN	ROUND

THERMAL OXIDATION UNIT

TOU-G-1	NAT. GAS	GUH-NW-scrubber room	3/4" ball	YELLOW	ROUND
TOU-G-2	NAT. GAS	GUH-control room N. wall	1/2" ball	YELLOW	ROUND
TOU-G-3	NAT. GAS	GUH- NaOH containment	1/2" ball	YELLOW	ROUND
TOU-G-4	NAT. GAS	GUH-NaOH containment	1/2" ball	YELLOW	ROUND
TOU-G-5	NAT. GAS	Outside Main	3" backflow	YELLOW	ROUND
TOU-G-6	NAT. GAS	On control room line	1" backflow	YELLOW	ROUND
TOU-G-7	NAT. GAS	On scrubber room line	1" backflow	YELLOW	ROUND
TOU-G-8	NAT. GAS	Gas line pressure gauge	1" backflow	YELLOW	ROUND
TOU-G-9	NAT. GAS	Supply-burners #1	1" backflow	YELLOW	ROUND
TOU-G-10	NAT. GAS	Supply-burners #1	1" backflow	YELLOW	ROUND
TOU-G-11	NAT. GAS	Pilot-burner #1	3/4" ball	YELLOW	ROUND
TOU-G-12	NAT. GAS	Pilot-before #1	solenoid	YELLOW	ROUND
BMV-54	NAT. GAS	Burner -Low press. shut off	press. switch	YELLOW	ROUND
BMV-55	NAT. GAS	Burner -high press shut off	press. switch	YELLOW	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
TOU-G-13	NAT. GAS	Purge port-main line	solenoid	YELLOW	ROUND
TOU-G-14	NAT. GAS	Supply-burners #2	1" backflow	YELLOW	ROUND
TOU-G-15	NAT. GAS	Supply-burners #2	1" backflow	YELLOW	ROUND
TOU-G-16	NAT. GAS	Pilot-burner #2	3/4" ball	YELLOW	ROUND
TOU-G-17	NAT. GAS	Pilot-before #2	Solenoid	YELLOW	ROUND
BMV-76	NAT. GAS	Low press. shut off	press. switch	YELLOW	ROUND
BMV-77	NAT. GAS	High press. shut off	press. switch	YELLOW	ROUND
TOU-G-18	NAT. GAS	Purge port-main line	solenoid	YELLOW	ROUND
TOU-SH-1	CAUSTIC	Level indicator- NaOH-top	1" ball	PURPLE	ROUND
TOU-SH-2	CAUSTIC	Level indicator- NaOH-bottom	1" ball	PURPLE	ROUND
TOU-SH-3	CAUSTIC	Overflow	2" ball	PURPLE	ROUND
TOU-SH-4	CAUSTIC	Discharge -at tank	1" ball	PURPLE	ROUND
TOU-SH-5	CAUSTIC	Discharge-after pump	backpress.	PURPLE	ROUND
TOU-SH-6	CAUSTIC	Discharge-after pump	1" ball	PURPLE	ROUND
TOU-SH-7	CAUSTIC	NaOH Supply Connection	2" ball	PURPLE	ROUND
TOU-SH-8	CAUSTIC	NaOH influent-scrubber	1" ball	PURPLE	ROUND
TOU-DCW-1	POT. Cold H20	Supply-hose/shower- bef. meter	1" ball	BLACK	SQUARE
TOU-DCW-2	POT. Cold H20	Supply-hose/shower- after meter	1" ball	BLACK	SQUARE
TOU-DCW-3	POT. Cold H20	At hose connection	3/4" ball	BLACK	SQUARE
TOU-NPW-1	NONPOT H20	Main supply- south door	3" ball	PINK	SQUARE
TOU-NPW-2	NONPOT H20	Main supply-pressure gauge	3/4" ball	PINK	SQUARE
TOU-NPW-3	NONPOT H20	Supply-make-up H20-drain	1" ball	PINK	SQUARE
TOU-NPW-4	NONPOT H20	Influent-SLD831(#1)	3" ball	PINK	SQUARE
TOU-NPW-5	NONPOT H20	Influent recycle #1purge	1/2" ball	PINK	SQUARE
TOU-NPW-6	NONPOT H20	Effluent recycle #1	3" butterfly	PINK	SQUARE
TOU-NPW-7	NONPOT H20	Pressure gauge	1/4" ball	PINK	SQUARE
OU-NPW-7	NONPOT H20	Pressure gauge #2	1/4" ball	PINK	SQUARE
TOU-NPW-8	NONPOT H20	Influent-SLD830(#2)	3" ball	PINK	SQUARE
TOU-NPW-9	NONPOT H20	Influent recycle #2 purge	1/2" ball	PINK	SQUARE
TOU-NPW-10	NONPOT H20	Effluent recycle #2	3" butterfly	PINK	SQUARE
TOU-NPW-11	NONPOT H20	Supply-top scrubber nozzles	3" ball	PINK	SQUARE
TOU-NPW-12	NONPOT H20	Supply-top scrubber nozzles	3" gate	PINK	SQUARE
TOU-NPW-13	NONPOT H20	Supply-low scrub noz./quench	2" ball	PINK	SQUARE
TOU-NPW-14	NONPOT H20	Supply-low scrub noz./quench	2" gate	PINK	SQUARE
TOU-NPW-15	NONPOT H20	pH-before electrode	1" ball	PINK	SQUARE
TOU-NPW-16	NONPOT H20	pH-after electrode	1" ball	PINK	SQUARE
TOU-NPW-17	NONPOT H20	Influent-low scrub.nozzle	2" ball	PINK	SQUARE
TOU-NPW-18	NONPOT H20	Influent-quench-back	2" ball	PINK	SQUARE
TOU-NPW-19	NONPOT H20	Supply-dump tank/front quench	1" gate	PINK	SQUARE
TOU-NPW-20	NONPOT H20	Influent-dump tank	1" ball	PINK	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
TOU-NPW-21	NONPOT H20	Influent-dump tank	solenoid	PINK	SQUARE
TOU-NPW-22	NONPOT H20	Discharge-dump tank	1" ball	PINK	SQUARE
TOU-NPW-23	NONPOT H20	Discharge-dump tank	solenoid	PINK	SQUARE
TOU-NPW-24	NONPOT H20	Influent-quench-front	solenoid	PINK	SQUARE
TOU-NPW-25	NONPOT H20	Influent quench-pressure gauge	1" ball	PINK	SQUARE
TOU-NPW-26	NONPOT H20	Level indicator-scrubber-top	1" ball	PINK	SQUARE
TOU-NPW-27	NONPOT H20	Level indicator-scrubber-bottom	1" ball	PINK	SQUARE
TOU-NPW-28	NONPOT H20	Drain-scrubber tank	2" ball	PINK	SQUARE
TOU-OG-1	OFF GAS	Inlet air pressure gauge	1/2" ball	ORANGE	ROUND
TOU-OG-2	OFF GAS	Stack discharge air pres. gauge	1/2" ball	ORANGE	ROUND
TOU-OG-3	OFF GAS	Demister purge/sample port	1/2" ball	ORANGE	ROUND
TOU-OG-4	OFF GAS	Scruibber tower sample port	1/2" ball	ORANGE	ROUND
TOU-CA-1	COMP. AIR	Supply-hose connec. NE wall	1/2 ball	DARK BLUE	SQUARE
TOU-CW-1	CORR. WASTE	Influent-caustic pump	1" ball	PPLE GREE	SQUARE
TOU-CW-2	CORR.WASTE	Effluent-caustic pump	1" ball	PPLE GREE	SQUARE

SLUDGE PUMP HOUSE

SPH-G-1	NAT. GAS	at GUH-978A	1/2" bkflo prev	YELLOW	ROUND
SPH-G-2	NAT. GAS	at GUH-978B	1/2" bkflo prev	YELLOW	ROUND
SPH-G-3	NAT. GAS	Main shutoff-north wall	1" backflow	YELLOW	ROUND
SPH-G-4	NAT. GAS	Main shutoff - outside	1" backflow	YELLOW	ROUND
SPH-NPW-1	NONPOT H20	Influent Line	1-1/2" ball	PINK	SQUARE
SPH-NPW-2	NONPOT H20	Seal water RSP-320	3/4" ball	PINK	SQUARE
SPH-NPW-3	NONPOT H20	Seal water RSP-321	3/4" ball	PINK	SQUARE
SPH-NPW-4	NONPOT H20	Seal water RSP-322	3/4" ball	PINK	SQUARE
SPH-NPW-5	NONPOT H20	Seal water RSP-220	3/4" ball	PINK	SQUARE
SPH-NPW-6	NONPOT H20	Seal water RSP-221	3/4" ball	PINK	SQUARE
SPH-NPW-7	NONPOT H20	Seal water RSP-222	3/4" ball	PINK	SQUARE
SPH-NPW-8	NONPOT H20	Seal water STP-211	3/4" ball	PINK	SQUARE
SPH-NPW-9	NONPOT H20	Seal water STP-212	3/4" ball	PINK	SQUARE
SPH-NPW-10	NONPOT H20	Flush water RSP 320	1-1/2" ball	PINK	SQUARE
SPH-NPW-11	NONPOT H20	Flush water RSP-321	1-1/2" ball	PINK	SQUARE
SPH-NPW-12	NONPOT H20	Flush water RSP-322	1-1/2" ball	PINK	SQUARE
SPH-NPW-13	NONPOT H20	Flush water RSP-220	1-1/2" ball	PINK	SQUARE
SPH-NPW-14	NONPOT H20	Flush water RSP-221	1-1/2" ball	PINK	SQUARE
SPH-NPW-15	NONPOT H20	Flush water RSP-222	1-1/2" ball	PINK	SQUARE
SPH-NPW-16	NONPOT H20	Flush water STP-211	1-1/2" ball	PINK	SQUARE
SPH-NPW-17	NONPOT H20	Flush water STP-212	1-1/2" ball	PINK	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
SPH-NPW-18	NONPOT H20	Reel hose connection	1" ball	PINK	SQUARE
SPH-NPW-19	NONPOT H20	STP seal bypass	1" ball	PINK	SQUARE
SPH-NPW-20	NONPOT H20	Supply line to T.O.U.	1-1/2" ball	PINK	SQUARE
SPH-NPW-21	NONPOT H20	Supply to 300 series pumps	1-1/2"ball	PINK	SQUARE
SPH-NPW-22	NONPOT H20	Supply to 200 series pumps	1-1/2" ball	PINK	SQUARE
SPH-RAS-1	SLUDGE	Effluent psi gauge RSP-320	3/4" ball	BLACK	ROUND
SPH-RAS-2	SLUDGE	Effluent psi gauge RSP-321	3/4" ball	BLACK	ROUND
SPH-RAS-3	SLUDGE	Effluent psi gauge RSP-322	3/4" ball	BLACK	ROUND
SPH-RAS-4	SLUDGE	Effluent psi gauge RSP-220	3/4" ball	BLACK	ROUND
SPH-RAS-5	SLUDGE	Effluent psi gauge RSP-221	3/4" ball	BLACK	ROUND
SPH-RAS-6	SLUDGE	Effluent psi gauge RSP-222	3/4" ball	BLACK	ROUND
SPH-RAS-7	SLUDGE	Sample port RSP-320	3/4" ball	BLACK	ROUND
SPH-RAS-8	SLUDGE	Sample port RSP-321	3/4" ball	BLACK	ROUND
SPH-RAS-9	SLUDGE	Sample port RSP-322	3/4" ball	BLACK	ROUND
SPH-RAS-10	SLUDGE	Sample port RSP-220	3/4" ball	BLACK	ROUND
SPH-RAS-11	SLUDGE	Sample port RSP-221	3/4" ball	BLACK	ROUND
SPH-RAS-12	SLUDGE	Sample port RSP-222	3/4" ball	BLACK	ROUND
SPH-RAS-13	**NO VALVE**				
SPH-RAS-14	**NO VALVE**				
SPH-RAS-15	SLUDGE	Influent meter C-301	1" ball	BLACK	ROUND
SPH-RAS-16	SLUDGE	Influent meter C-302	1" ball	BLACK	ROUND
SPH-RAS-17	SLUDGE	Influent meter C-201	1" ball	BLACK	ROUND
SPH-RAS-18	SLUDGE	Influent meter C-202	1" ball	BLACK	ROUND
SPH-WAS-1	SLUDGE	Effluent psi gauge STP-211	3/4" ball	BLACK	ROUND
SPH-WAS-2	SLUDGE	Effluent psi gauge RSP-212	3/4" ball	BLACK	ROUND
SPH-WAS-3	SLUDGE	Influent meter digester-201	1" ball	BLACK	ROUND
SPH-WAS-4	SLUDGE	Influent meter digester-202	1" ball	BLACK	ROUND
SPH-WAS-5	SLUDGE	Sample port STP-211	3/4" ball	BLACK	ROUND
SPH-WAS-6	SLUDGE	Sample port STP-212	3/4" ball	BLACK	ROUND
SPH-WAS-7	SLUDGE	STP Discharge to M-701	3" ball	BLACK	ROUND
SPH-WAS-8	SLUDGE	STP Discharge to 1st Stage	3" ball	BLACK	ROUND
SPH-WAS-9	SLUDGE	STP discharge to digestor	3" ball	BLACK	ROUND
V-220A	SLUDGE	Influent from clarifier-202	4" ball	BLACK	ROUND
V-220B	SLUDGE	Influent from clarifier-201	4" ball	BLACK	ROUND
V-220C	SLUDGE	Discharge	4" check	BLACK	ROUND
V-220D	SLUDGE	Discharge to PCT-202	4" ball	BLACK	ROUND
V-220E	SLUDGE	Discharge to PCT-201	4" ball	BLACK	ROUND
V-221A	SLUDGE	Influent from clarifier-201	4" ball	BLACK	ROUND
V-221B	SLUDGE	Pump discharge	4" ball	BLACK	ROUND
V-221C	SLUDGE	Discharge	4" check	BLACK	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
V-221D	SLUDGE	Discharge before flowmeter	4" ball	BLACK	ROUND
V-221E	SLUDGE	Discharge after flowmeter	4" ball	BLACK	ROUND
MOV-221F	SLUDGE	Discharge to 1st stage-201	4" ball	BLACK	ROUND
MOV-221G	SLUDGE	Discharge to digester-201	4" ball	BLACK	ROUND
V-221H	SLUDGE	Bypass	4" ball	BLACK	ROUND
V-222A	SLUDGE	Influent from clarifier-202	4" ball	BLACK	ROUND
V-222B	SLUDGE	Pump discharge	4" ball	BLACK	ROUND
V-222C	SLUDGE	Discharge	4" check	BLACK	ROUND
V-222D	SLUDGE	Discharge before flowmeter	4" ball	BLACK	ROUND
V-222E	SLUDGE	Discharge after flowmeter	4" ball	BLACK	ROUND
MOV-222F	SLUDGE	Discharge to digester-202	4" ball	BLACK	ROUND
MOV-222G	SLUDGE	Discharge to 1st stage-202	4" ball	BLACK	ROUND
V-222H	SLUDGE	Bypass	4" ball	BLACK	ROUND
V-320A	SLUDGE	Influent from C-302	4" ball	BLACK	ROUND
V-320B	SLUDGE	Influent from C-301	4" ball	BLACK	ROUND
V-320C	SLUDGE	Discharge	4" check	BLACK	ROUND
V-320D	SLUDGE	Discharge to PCT-202	4" ball	BLACK	ROUND
V-320E	SLUDGE	Discharge to PCT-201	4" ball	BLACK	ROUND
V-321A	SLUDGE	Influent from C-301	4" ball	BLACK	ROUND
V-321B	SLUDGE	Pump discharge	4" ball	BLACK	ROUND
V-321C	SLUDGE	Discharge	4" check	BLACK	ROUND
V-321D	SLUDGE	Discharge before flowmeter	4" ball	BLACK	ROUND
V-321E	SLUDGE	Discharge after flowmeter	4" ball	BLACK	ROUND
MOV-321F	SLUDGE	Discharge to 2nd stage-201	4" ball	BLACK	ROUND
MOV-321G	SLUDGE	Discharge to 1st stage-201	4" ball	BLACK	ROUND
V-321H	SLUDGE	Bypass	4" ball	BLACK	ROUND
V-322A	SLUDGE	Influent from C-302	4" ball	BLACK	ROUND
V-322B	SLUDGE	Pump discharge	4" ball	BLACK	ROUND
V-322C	SLUDGE	Discharge	4" check	BLACK	ROUND
V-322D	SLUDGE	Discharge before flowmeter	4" ball	BLACK	ROUND
V-322E	SLUDGE	Discharge after flowmeter	4" ball	BLACK	ROUND
MOV-322F	SLUDGE	Discharge to 2nd st.-202	4" ball	BLACK	ROUND
MOV-322G	SLUDGE	Discharge to 1st st.-202	4" ball	BLACK	ROUND
V-322H	SLUDGE	Bypass	4" ball	BLACK	ROUND
V-211C	SLUDGE	Influent from digester-201	4" ball	BLACK	ROUND
V-211D	SLUDGE	Pump discharge	4" ball	BLACK	ROUND
V-211E	SLUDGE	Discharge	4" check	BLACK	ROUND
V-211F	SLUDGE	Influent from digester-201	4" ball	BLACK	ROUND
V-212C	SLUDGE	Influent from digester -202	4" ball	BLACK	ROUND
V-212E	SLUDGE	Discharge	4" check	BLACK	ROUND
V-212D	SLUDGE	Pump effluent	4" ball	BLACK	ROUND
V-212F	SLUDGE	Influent from digester-202	4" ball	BLACK	ROUND
V-213	SLUDGE	Discharge to M-701	4" ball	BLACK	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE

SLUDGE TREATMENT BUILDING

STB-G-1	NAT. GAS	at GUH-971A	1/2" bkflo prev	YELLOW	ROUND
STB-G-2	NAT. GAS	at GUH-971B	1/2" bkflo prev	YELLOW	ROUND
STB-G-3	NAT. GAS	at GUH-971C	1/2" bkflo prev	YELLOW	ROUND
STB-G-4	NAT. GAS	at GUH-971D	1/2" bkflo prev	YELLOW	ROUND
STB-G-5	NAT. GAS	at GUH-971E	1/2" bkflo prev	YELLOW	ROUND
STB-G-6	NAT. GAS	at GUH-971F	1/2" bkflo prev	YELLOW	ROUND
STB-G-7	NAT. GAS	at GUH-971G	1/2" bkflo prev	YELLOW	ROUND
STB-G-8	NAT. GAS	at GUH-971H	1/2" bkflo prev	YELLOW	ROUND
STB-G-9	NAT. GAS	at GUH 972A	1/2" bkflo prev	YELLOW	ROUND
STB-G-10	NAT. GAS	at GUH-972B	1/2" bkflo prev	YELLOW	ROUND
STB-G-11	NAT GAS	Water heater	1/2" bkflo prev	YELLOW	ROUND
STB-G-12	NAT. GAS	Main line shutoff-inside	2" backflow	YELLOW	ROUND
STB-G-13	NAT. GAS	Main line shutoff-outside	1-1/4" bckflow	YELLOW	ROUND

STB-CA-1	COMP. AIR	Discharge-AC 751	2" ball	DARK BLUE	SQUARE
STB-CA-2	COMP. AIR	Discharge-condensation-top	3/4" ball	DARK BLUE	SQUARE
STB-CA-3	COMP. AIR	Discharge-condensation-bottom	3/4" ball	DARK BLUE	SQUARE
STB-CA-4	COMP. AIR	Pressure relief-tank	1/4" popoff	DARK BLUE	SQUARE
STB-CA-5	COMP. AIR	Pressure relief-lg. cylinder	1/4" popoff	DARK BLUE	SQUARE
STB-CA-6	COMP. AIR	Pressure relief-air cooler	1/4" popoff	DARK BLUE	SQUARE
STB-CA-7	COMP. AIR	Tank to control panel	solenoid	DARK BLUE	SQUARE
STB-CA-8	COMP. AIR	Discharge-AC 752	2" ball	DARK BLUE	SQUARE
STB-CA-9	COMP. AIR	Discharge-condensation-top	3/4" ball	DARK BLUE	SQUARE
STB-CA-10	COMP. AIR	Discharge-condensation-bottom	3/4" ball	DARK BLUE	SQUARE
STB-CA-11	COMP. AIR	Pressure relief-tank	1/4" popoff	DARK BLUE	SQUARE
STB-CA-12	COMP. AIR	Pressure relief-lg. cylinder	1/4" popoff	DARK BLUE	SQUARE
STB-CA-13	COMP. AIR	Pressure relief-air cooler	1/4" popoff	DARK BLUE	SQUARE
STB-CA-14	COMP. AIR	Tank to control panel	solenoid	DARK BLUE	SQUARE
STB-CA-15	COMP. AIR	PSI gauge-both 751/752-at 'T'	1/2" ball	DARK BLUE	SQUARE
STB-CA-16	COMP. AIR	Discharge-condensation-at floor	1/2" ball	DARK BLUE	SQUARE
STB-CA-17	COMP. AIR	Control regulator pressure	1/2" ball	DARK BLUE	SQUARE
STB-CA-18	COMP. AIR	Coalescing filter-before	3/4" ball	DARK BLUE	SQUARE
STB-CA-19	COMP. AIR	Coalescing filter-after	3/4" ball	DARK BLUE	SQUARE
STB-CA-20	COMP. AIR	Coalescing filter-bypass	3/4" ball	DARK BLUE	SQUARE
STB-CA-21	COMP. AIR	Supply-lime silo	1" ball	DARK BLUE	SQUARE
STB-CA-22	COMP. AIR	Supply-S.E. bay connection	1/2" ball	DARK BLUE	SQUARE
STB-CA-23	COMP. AIR	Supply-S. middle bay connec.	1/2" ball	DARK BLUE	SQUARE
STB-CA-24	COMP. AIR	Supply- S.W.bay connection	1/2" ball	DARK BLUE	SQUARE
STB-CA-25	COMP. AIR	Supply to FFP's-middle bay	3/4" ball	DARK BLUE	SQUARE
STB-CA-26	COMP. AIR	Supply-721E	1/2" ball	DARK BLUE	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
STB-CA-27	COMP. AIR	Supply-722E	1/2" ball	DARK BLUE	SQUARE
STB-CA-28	COMP. AIR	Supply-723E	1/2" ball	DARK BLUE	SQUARE
STB-CA-29	COMP. AIR	Supply-711B-core blow	1/2" ball	DARK BLUE	SQUARE
STB-CA-30	COMP. AIR	Supply-712B-core blow	1/2" ball	DARK BLUE	SQUARE
STB-CA-31	COMP. AIR	Supply-713B-core blow	1/2" ball	DARK BLUE	SQUARE
STB-CA-32	COMP. AIR	Supply-FP721-drain blow	1" ball	DARK BLUE	SQUARE
V-721I	COMP. AIR	Supply-FP721-drain blow valve	2" ball	DARK BLUE	SQUARE
STB-CA-33	COMP. AIR	Supply-FFP721-core blow	1" ball	DARK BLUE	SQUARE
V-721H	COMP. AIR	Supply-FFP721-core blow valve	2" ball	DARK BLUE	SQUARE
STB-CA-34	COMP. AIR	Supply-cont.panel-air valv -721	3/4" ball	DARK BLUE	SQUARE
STB-CA-35	COMP. AIR	Supply-FP722-drain blow	1" ball	DARK BLUE	SQUARE
V-722I	COMP. AIR	Supply-FP722-drain blow valve	2" ball	DARK BLUE	SQUARE
STB-CA-36	COMP. AIR	Supply-FFP722-core blow	1" ball	DARK BLUE	SQUARE
V-722H	COMP. AIR	Supply-FFP722-core blow valve	2" ball	DARK BLUE	SQUARE
STB-CA-37	COMP. AIR	Supply-cont.panel-air valve-722	3/4" ball	DARK BLUE	SQUARE
STB-CA-38	COMP. AIR	Supply-FP723-drain blow	1" ball	DARK BLUE	SQUARE
V-723I	COMP. AIR	Supply-FP723-drain blow valve	2" ball	DARK BLUE	SQUARE
STB-CA-39	COMP. AIR	Supply-FFP723-core blow	1" ball	DARK BLUE	SQUARE
V-723H	COMP. AIR	Supply-FFP723-core blow valve	2" ball	DARK BLUE	SQUARE
STB-CA-40	COMP. AIR	Supply-cont.panel-air valve-723	3/4" ball	DARK BLUE	SQUARE
STB-DCW-1	POT CLD H20	Influent-east wall	3" ball	BLACK	SQUARE
STB-DCW-2	POT CLD H20	Purge port-before gate	1/2" ball	BLACK	SQUARE
STB-DCW-3	POT CLD H20	Shutoff to backflow prev.valve	4" gate	BLACK	SQUARE
STB-DCW-4	POT CLD H20	Purge port-after gate	1/2" ball	BLACK	SQUARE
STB-DCW-5	POT CLD H20	Backflow preventer	4" flap	BLACK	SQUARE
STB-DCW-5	POT CLD H20	Purge port-on preventer	1/2" ball	BLACK	SQUARE
STB-DCW-6	POT CLD H20	Backflow preventer	4" flap	BLACK	SQUARE
STB-DCW-7	POT CLD H20	Purge port-on preventer	1/2" ball	BLACK	SQUARE
STB-DCW-8	POT CLD H20	Shutoff to backflow prev. valve	4" gate	BLACK	SQUARE
STB-DCW-9	POT CLD H20	Backflow preventer bypass	4" ball	BLACK	SQUARE
STB-DCW-10	POT CLD H20	Supply-outside hose connec.	1" ball	BLACK	SQUARE
STB-DCW-11	POT CLD H20	Shutoff-hose connection	1" ball	BLACK	SQUARE
TB-DCW-11	POT CLD H20	Supply-polymer/hose connec.	1" ball	BLACK	SQUARE
STB-DCW-12	POT CLD H20	Supply-hot H20 heater	1" ball	BLACK	SQUARE
STB-DCW-13	POT CLD H20	Supply-Saf-T-Flo	3/4" ball	BLACK	SQUARE
TB-DCW-13	POT CLD H20	Supply-cold water(pipe)	3/4" ball	BLACK	SQUARE
STB-DCW-14	POT CLD H20	Supply-S.E. bay hose connec.	3/4" ball	BLACK	SQUARE
STB-DCW-15	POT CLD H20	Supply -PP620/621/622	1" ball	BLACK	SQUARE
V-620A	POT CLD H20	Supply-PP620	1" ball	BLACK	SQUARE
V-621A	POT CLD H20	Supply-PP621	1" ball	BLACK	SQUARE
V-622A	POT CLD H20	Supply-PP622	1" ball	BLACK	SQUARE
STB-DCW-16	POT CLD H20	Supply-middle bay hose connec.	1" ball	BLACK	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
STB-DCW-17	POT CLD H20	Supply- S.W. bay hose connec.	1" ball	BLACK	SQUARE
STB-DCW-18	POT CLD H20	Supply-sludge pump house	1" ball	BLACK	SQUARE
STB-DHW-1	POT HOT H20	Supply-Saf-T-Flo	3/4" ball	YELLOW	SQUARE
STB-DHW-2	POT HOT H20	Supply-sink	1/2" ball	YELLOW	SQUARE
STB-TMP-1	TEMP H20	Discharge-Saf-T-Flo-bottom	3/4" ball	AQUA	SQUARE
STB-TMP-2	TEMP H20	Supply-safety shower	1" ball	AQUA	SQUARE
STB-NPW-1	NONPOT H20	Influent supply-east wall	4" ball	PINK	SQUARE
STB-NPW-2	NONPOT H20	Influent-above 4"-bypass to pot.	2" ball	PINK	SQUARE
STB-NPW-3	NONPOT H20	Supply-1 1/2" hose conn. at infl.	2" ball	PINK	SQUARE
STB-NPW-4	NONPOT H20	Supply-1 1/2" hose conn. at infl.	2" ball	PINK	SQUARE
STB-NPW-5	NONPOT H20	Influent-PWT741	2" ball	PINK	SQUARE
SV-740	NONPOT H20	Influent-PWT741	solenoid	PINK	SQUARE
V-745	NONPOT H20	Drain-PWT741	2" ball	PINK	SQUARE
V-741	NONPOT H20	Influent-PWP742	3" ball	PINK	SQUARE
V-744	NONPOT H20	Discharge-PWP742 -press.gauge	3/4" ball	PINK	SQUARE
V-742A	NONPOT H20	Supply-FP721	1-1/2" ball	PINK	SQUARE
V-742B	NONPOT H20	Supply-FP722	1-1/2" ball	PINK	SQUARE
V-742C	NONPOT H20	Supply-FP723	1-1/2" ball	PINK	SQUARE
STB-NPW-6	NONPOT H20	Influent-AWT732	2" ball	PINK	SQUARE
SV-730	NONPOT H20	Influent-AWT732	solenoid	PINK	SQUARE
STB-NPW-7	NONPOT H20	Influent-sludge line flush	1-1/2" ball	PINK	SQUARE
STB-NPW-8	NONPOT H20	Influent-sludge line flush	solenoid	PINK	SQUARE
V-701B	FILTER FD	Supply to FFP's	6" ball	BLACK	ROUND
STB-FF-1	FILTER FD	Liquid level indicator	3" gate	BLACK	ROUND
V-711A	FILTER FD.	Influent-FFP 711	6" ball	BLACK	ROUND
V-711B	FILTER FD.	Core blow down	4" ball	BLACK	ROUND
V-711C	FILTER FD.	Discharge-FFP 711	6" ball	BLACK	ROUND
STB-FF-2	FILTER FD.	Suction stabilizer tank blow off	1" ball	BLACK	ROUND
STB-FF-3	FILTER FD.	Suction stabilizer tank drain-top	1" ball	BLACK	ROUND
STB-FF-4	FILTER FD.	Suction stabilizer tank drain-bott	1" ball	BLACK	ROUND
STB-FF-5	FILTER FD.	Disch. stabilizer blowoff/connec.	3/4" ball	BLACK	ROUND
STB-FF-6	FILTER FD.	Discharge stabilizer drain	1" ball	BLACK	ROUND
V-710A	FILTER FD.	Influent-FFP 710	6" ball	BLACK	ROUND
V-710B	FILTER FD.	Discharge-FFP710	6" ball	BLACK	ROUND
V-710C	FILTER FD.	Discharge-FFP710	6" ball	BLACK	ROUND
V-710D	FILTER FD.	Discharge-FFP710	6" ball	BLACK	ROUND
STB-FF-7	FILTER FD.	Suction stabilizer tank blow off	1" ball	BLACK	ROUND
STB-FF-8	FILTER FD.	Suction stabilizer tank drain-top	1" ball	BLACK	ROUND
STB-FF-9	FILTER FD.	Suction stabilizer tank drain-bott	1" ball	BLACK	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
STB-FF-10	FILTER FD.	Discharge stabilizer air conn.	3/4" ball	BLACK	ROUND
STB-FF-11	FILTER FD.	Discharge stabilizer drain	1" ball	BLACK	ROUND
V-712A	FILTER FD.	Influent-FFP 712	6" ball	BLACK	ROUND
V-712B	FILTER FD.	Core blow down	4" ball	BLACK	ROUND
V-712C	FILTER FD.	Discharge-FFP 712	6" ball	BLACK	ROUND
STB-FF-12	FILTER FD.	Suction stabilizer tank blow off	1" ball	BLACK	ROUND
STB-FF-13	FILTER FD.	Suction stabilizer tank drain-top	1" ball	BLACK	ROUND
STB-FF-14	FILTER FD.	Suction stabilizer tank drain-bott	1" ball	BLACK	ROUND
STB-FF-15	FILTER FD.	Disch. stabilizer blowoff/conn.	3/4" ball	BLACK	ROUND
STB-FF-16	FILTER FD.	Discharge stabilizer drain	1" ball	BLACK	ROUND
V-713A	FILTER FD.	Influent-FFP 713	6" ball	BLACK	ROUND
V-713B	FILTER FD.	Core blow down	4" ball	BLACK	ROUND
V-713C	FILTER FD.	Discharge-FFP 713	6" ball	BLACK	ROUND
STB-FF-17	FILTER FD.	Suction stabilizer tank blow off	1" ball	BLACK	ROUND
STB-FF-18	FILTER FD.	Suction stabilizer tank drain-top	1" ball	BLACK	ROUND
STB-SL-19	FILTER FD.	Suction stabilizer tank drain-bott	1" ball	BLACK	ROUND
STB-FF-20	FILTER FD.	Disch. stabilizer blowoff/conn.	3/4" ball	BLACK	ROUND
STB-FF-21	FILTER FD.	Discharge stabilizer drain	1" ball	BLACK	ROUND
V-723E	FILTER FD.	Feed to FP-723	4" ball	BLACK	ROUND
V-721E	FILTER FD.	Feed to FP-721	4" ball	BLACK	ROUND
V-722E	FILTER FD.	Feed to FP-722	4" ball	BLACK	ROUND
STB-FF-22	FILTER FD.	Feed-FP723-pressure gauge	1/2" ball	BLACK	ROUND
STB-FF-23	FILTER FD.	Feed-FP721-pressure gauge	1/2" ball	BLACK	ROUND
STB-FF-24	FILTER FD.	Feed-FP722-pressure gauge	1/2" ball	BLACK	ROUND
STB-FF-25	FILTER FD.	Sample port filter feed	3/4" ball	BLACK	ROUND
STB-FF-26	FILTER FD.	Influ.FFPs drain line - end	1" ball	BLACK	ROUND
STB-FF-27	FILTER FD.	Influ.FFPs drain line - middle	1" ball	BLACK	ROUND
STB-HY-1	HYDRAULIC	Drain-Hydraulic tank-FFP-711	3/4" ball	PURPLE	ROUND
STB-HY-2	HYDRAULIC	Drain-Hydraulic tank-FFP-710	3/4" ball	PURPLE	ROUND
STB-HY-3	HYDRAULIC	Drain-Hydraulic tank-FFP-712	3/4" ball	PURPLE	ROUND
STB-HY-4	HYDRAULIC	Drain-Hydraulic tank-FFP-713	3/4" ball	PURPLE	ROUND
V-731	ACID WASH	Disch.-AWT731 to AWP734	2" ball	PURPLE	ROUND
STB-AW-1	ACID WASH	Discharge-2nd Connection	2" ball	PURPLE	ROUND
STB-AW-2	ACID WASH	Discharge-vent/sample	1" ball	PURPLE	ROUND
STB-AW-3	ACID WASH	Discharge-vent/sample	1" ball	PURPLE	ROUND
V-735	ACID WASH	Return acid from FP's	2" gate	PURPLE	ROUND
V-734G	ACID WASH	Effluent-pump	1" ball	PURPLE	ROUND
V-734A	ACID WASH	Feed-FP721	1" ball	PURPLE	ROUND
V-734B	ACID WASH	Feed-FP722	1" ball	PURPLE	ROUND
V-734C	ACID WASH	Feed FP723	1" ball	PURPLE	ROUND
V-734D	ACID WASH	Acid return-FP721	1" ball	PURPLE	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
V-734E	ACID WASH	Acid return-FP722	1" ball	PURPLE	ROUND
V-734F	ACID WASH	Acid return-FP723	1" ball	PURPLE	ROUND
STB-PM-1	POLYMER	Supply from 55 gal. drum	3/4" ball	PURPLE	ROUND
STB-PM-2	POLYMER	Calibration column-bottom	3/4" ball	PURPLE	ROUND
STB-PM-3	POLYMER	Supply-FP620	3/4" ball	PURPLE	ROUND
STB-PM-4	POLYMER	Air purge port	1/4" ball	PURPLE	ROUND
STB-PM-5	POLYMER	Discharge-FP620	3/4" ball	PURPLE	ROUND
V-620B	POLYMER	Discharge bypass to C302	3/4" ball	PURPLE	ROUND
V-620C	POLYMER	Discharge bypass to C301	3/4" ball	PURPLE	ROUND
STB-PM-6	POLYMER	Supply from 55 gal. drum	3/4" ball	PURPLE	ROUND
STB-PM-7	POLYMER	Calibration column-bottom	3/4" ball	PURPLE	ROUND
STB-PM-8	POLYMER	Supply-FP622	3/4" ball	PURPLE	ROUND
V-621B	POLYMER	Air purge port	1/4" ball	PURPLE	ROUND
STB-PM-9	POLYMER	Discharge-FP622	1" ball	PURPLE	ROUND
STB-PM-10	POLYMER	Supply from 55 gal. drum	3/4" ball	PURPLE	ROUND
STB-PM-11	POLYMER	Calibration column-bottom	3/4" ball	PURPLE	ROUND
STB-PM-12	POLYMER	Supply-FP621	3/4" ball	PURPLE	ROUND
STB-PM-13	POLYMER	Air purge port	1/4" ball	PURPLE	ROUND
V-622B	POLYMER	Discharge-FP621	1" ball	PURPLE	ROUND
V-723A	FILTRATE	Press filtrate-FP723-top right	2" ball-air	DARK BLUE	ROUND
V-723B	FILTRATE	Press filtrate-FP723-top left	2" ball-air	DARK BLUE	ROUND
V-723C	FILTRATE	Press filtrate-FP723-bottom rigt	2" ball-air	DARK BLUE	ROUND
V-723D	FILTRATE	Press filtrate-FP723-bottom lft	2" ball-air	DARK BLUE	ROUND
V-723F	FILTRATE	Press filtrate-discharge-FP723	3" ball	DARK BLUE	ROUND
V-721A	FILTRATE	Press filtrate-FP721-top left	2" ball-air	DARK BLUE	ROUND
V-721B	FILTRATE	Press filtrate-FP721-top right	2" ball-air	DARK BLUE	ROUND
V-721C	FILTRATE	Press filtrate-FP721-bott. left	2" ball-air	DARK BLUE	ROUND
V-721D	FILTRATE	Press filtrate-FP721-bott. right	2" ball-air	DARK BLUE	ROUND
V-721F	FILTRATE	Press filtrate-discharge-FP721	3" ball	DARK BLUE	ROUND
V-722A	FILTRATE	Press filtrate-FP722-top left	2" ball-air	DARK BLUE	ROUND
V-722B	FILTRATE	Press filtrate-FP722-top right	2" ball-air	DARK BLUE	ROUND
V-722C	FILTRATE	Press filtrate-FP722 bott. left	2" ball-air	DARK BLUE	ROUND
V-722D	FILTRATE	Press filtrate -FP722-bott.right	2" ball-air	DARK BLUE	ROUND
V-722F	FILTRATE	Press filtrate discharge-FP722	2" ball-air	DARK BLUE	ROUND
V-723G	SMPL PORT	Filtrate sample port-FP723	1/2" ball	ORANGE	SQUARE
V-721G	SMPL PORT	Filtrate sample port-FP721	1/2" ball	ORANGE	SQUARE
V-722G	SMPL PORT	Filtrate sample port-FP722	1/2" ball	ORANGE	SQUARE
V-131A	TRD RECYCLE	Discharge-SP-131A	4" check	RED	ROUND
V-131B	TRD RECYCLE	Discharge SP-131B	4" check	RED	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
V-131C	TRD RECYCLE	Discharge SP-131A	4" ball	RED	ROUND
C-131D	TRD RECYCLE	Discharge SP-131B	4" ball	RED	ROUND

LIME SILO

LS-NPW-1	NONPOT H20	Influent-outside	3" ball	PINK	SQUARE
LS-NPW-2	NONPOT H20	Sample/relief port at silo wall	3/4" gate	PINK	SQUARE
LS-NPW-3	NONPOT H20	Aspirator water to mix tank	solenoid	PINK	SQUARE
LS-NPW-4	NONPOT H20	Aspirator water to mix tank	3/4" gate	PINK	SQUARE
LS-NPW-5	NONPOT H20	Control water to mix tank	solenoid	PINK	SQUARE
LS-NPW-6	NONPOT H20	Control water to mix tank	3/4" ball	PINK	SQUARE
LS-NPW-7	NONPOT H20	Control water at meter	3/4" gate	PINK	SQUARE
LS-NPW-7A	NONPOT H20	Control water above meter	3/4" gate	PINK	SQUARE
LS-NPW-8	NONPOT H20	Control water meter bypass	3/4" ball	PINK	SQUARE
LS-NPW-8A	NONPOT H20	Control water flow valve	flow	PINK	SQUARE
LS-NPW-9	NONPOT H20	LPS-640 flush	solenoid	PINK	SQUARE
LS-NPW-10	NONPOT H20	Seal water to LPS-640	solenoid	PINK	SQUARE
LS-NPW-11	NONPOT H20	LPS-641 flush	solenoid	PINK	SQUARE
LS-NPW-12	NONPOT H20	Seal water to LPS-641	solenoid	PINK	SQUARE

V-640A	LIME	Inf. slurry to LPS-640	1-1/2" diaph.	PURPLE	ROUND
V-640B	LIME	Discharge to M-701	2" gate	PURPLE	ROUND
V-641A	LIME	Inf. slurry to LPS-641	1-1/2" diaph.	PURPLE	ROUND
V-641B	LIME	Discharge to M-701	2" gate	PURPLE	ROUND
V-642	LIME	Drain-mix tank-spare part	1-1/2" ball	PURPLE	ROUND
LS-L-1	LIME	Main lime feed shutoff	10" knife	PURPLE	ROUND

LS-CA-1	COMP. AIR	Air drive for V-640A	solenoid	DARK BLUE	SQUARE
LS-CA-2	COMP. AIR	Shutoff to V-640A	3/4" ball	DARK BLUE	SQUARE
LS-CA-3	COMP. AIR	Air drive for V-641A	solenoid	DARK BLUE	SQUARE
LS-CA-4	COMP. AIR	Shutoff to V-641A	3/4" ball	DARK BLUE	SQUARE
LS-CA-5	COMP. AIR	Incoming comp.air-outside	3/4" ball	DARK BLUE	SQUARE

FIREWATER PUMP HOUSE

FWPH-G-1	NAT. GAS	Supply-water heater	1-1/4" bckflow	YELLOW	ROUND
FWPH-G-2	NAT. GAS	Supply-outside	1-1/2" bckflow	YELLOW	ROUND

FWPH-FW-1	FIRE H20	Influent bypass-H20 heater	2" gate	PINK	ROUND
FWPH-FW-2	FIRE H20	Influent-H20 heater	2" gate	PINK	ROUND
FWPH-FW-2	FIRE H20	Influent-H20 heater-press. guage	1/4" ball	PINK	ROUND
FWPH-FW-2	FIRE H20	Influent-H20 heater-press. guage	1/4" ball	PINK	ROUND
FWPH-FW-2	FIRE H20	Influent-H20 heater-press. guage	Flow switch	PINK	ROUND
FWPH-FW-2	FIRE H20	Effluent-H20 heater-press. relief	relief	PINK	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
FWPH-FW-3	FIRE H20	Effluent-H20 heater	2" gate	PINK	ROUND
FWPH-FW-4	FIRE H20	Bypass-H20 heater	2" gate	PINK	ROUND
FWPH-FW-5	FIRE H20	Recirc. line to tank- at floor	1-1/2" ball	PINK	ROUND
FWPH-FW-6	FIRE H20	Influent-FP680	8" gate	PINK	ROUND
FWPH-FW-7	FIRE H20	Influent-FP680 pressure gauge	1/4" ball	PINK	ROUND
FWPH-FW-8	FIRE H20	Discharge-FP680-pres.gauge port	1/4" ball	PINK	ROUND
FWPH-FW-9	FIRE H20	Supply-east/south hydrants	6" butterfly	PINK	ROUND
FWPH-FW-10	FIRE H20	Supply-outside hose connection	6" butterfly	PINK	ROUND
FWPH-FW-11	FIRE H20	Discharge-FT670-before elbow	6" butterfly	PINK	ROUND
FWPH-FW-12	FIRE H20	Discharge-FT670-after elbow	6" butterfly	PINK	ROUND
FWPH-FW-13	FIRE H20	Pressure relief overflow line	pres. relief	PINK	ROUND
FWPH-FW-14	FIRE H20	Press. relief overflow valve	6" pres. relief	PINK	ROUND
FWPH-FW-15	FIRE H20	Press. relief overflow guage	1/4" ball	PINK	ROUND
FWPH-FW-16	FIRE H20	S. Influent-sprinkler pump	1-1/4" gate	PINK	ROUND
FWPH-FW-17	FIRE H20	N. Influent-sprinkler pump	1-1/4" gate	PINK	ROUND
FWPH-FW-18	FIRE H20	Sprinkler press gauge	1/4" ball	PINK	ROUND
FWPH-FW-19	FIRE H20	Discharge-sprinkler pump-floor	flapper	PINK	ROUND
FWPH-FW-20	FIRE H20	Supply-sprinkler heads-wall	1-1/4" gate	PINK	ROUND
FWPH-FW-21	FIRE H20	Supply-sprinkler head-wall	flapper	PINK	ROUND
FWPH-FW-22	FIRE H20	Drain-sprinkler	1/4" ball	PINK	ROUND
FWPH-FW-23	FIRE H20	Influ.-H20 heater crtl panel-top	3/4" gate	PINK	ROUND
FWPH-FW-24	FIRE H20	Air purge-H20 heater crtl panel	3/4" gate	PINK	ROUND
FWPH-FW-25	FIRE H20	Supply-H20 heater crtl panel	3/4" check	PINK	ROUND
FWPH-FW-26	FIRE H20	Influent-H20 heater crtl panel	3/4" check	PINK	ROUND
FWPH-FW-27	FIRE H20	Influent-fire pump ctrl panel-top	3/4" gate	PINK	ROUND
FWPH-FW-28	FIRE H20	Influent-fire pump ctrl panel	3/4" gate	PINK	ROUND
FWPH-FW-29	FIRE H20	Supply-pump control panel	3/4" check	PINK	ROUND
WPH-FW-29	FIRE H20	Supply-pump cont. panel-above	3/4" check	PINK	ROUND
FWPH-FW-30	FIRE H20	Discharge-refill-FT670	2" backflow	PINK	ROUND
FWPH-FW-31	FIRE H20	Disch.-refill-FT670-bef.diaph.	2" gate	PINK	ROUND
FWPH-FW-32	FIRE H20	Disch.-refill-FT670-aft.diaph.	2" gate	PINK	ROUND
FWPH-FW-33	FIRE H20	Discharge-refill-bef.press gauge	3/4" ball	PINK	ROUND
FWPH-FW-34	FIRE H20	Discharge-refill-bef. diaphragm	3/4" ball	PINK	ROUND
FWPH-FW-35	FIRE H20	Fire hose connection-outside	2" gate	PINK	ROUND
FWPH-FW-36	FIRE H20	Fire hose connection-outside	2" gate	PINK	ROUND
FWPH-FW-37	FIRE H20	Fire hose connection-outside	2" gate	PINK	ROUND
FWPH-FW-38	FIRE H20	Sample port-discharge line	1/2" ball	PINK	ROUND
FWPH-FW-39	FIRE H20	Disch.-refill FT670 PSI gauge	1/4" ball	PINK	ROUND
FWPH-FW-40	FIRE H20	Disch.-refill FT670 PSI gauge	1/4" ball	PINK	ROUND
FWPH-FW-41	FIRE H20	Discharge-PSI gauge purge	1/4" ball	PINK	ROUND
FWPH-FW-42	FIRE H20	Discharge-PSI gauge purge	1/4" ball	PINK	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
CARBON SILO					
CS-NPW-1	NONPOT	Eductor /injector hose connec.	3/4" ball	PINK	SQUARE
CS-NPW-2	NONPOT	Eductor /injector before meter	1" ball	PINK	SQUARE
CS-NPW-3	NONPOT	Eductor /injector after meter	3/4" ball	PINK	SQUARE
CS-NPW-4	NONPOT	Eductor /injector feed	solenoid	PINK	SQUARE
CS-NPW-5	NONPOT	Eductor /injector after sol.	1" ball	PINK	SQUARE
CS-NPW-6	NONPOT	Eductor bypass feed	1" ball	PINK	SQUARE
CS-NPW-7	NONPOT	Injector bypass feed	1" ball	PINK	SQUARE
CS-NPW-8	NONPOT	Front injector feed	1" gate	PINK	SQUARE
CS-NPW-9	NONPOT	Rear injector feed	1" gate	PINK	SQUARE
CS-PAC-1	P.A. CARBON	Carbon feed to mix tank	8" knife	PURPLE	ROUND
GROUNDWATER TREATMENT BUILDING					
GTB-G-1	NAT. GAS	Outside supply-GTB	3" bkflo prev	YELLOW	ROUND
GTB-G-2	NAT. GAS	Outside supply-1" line	1" bkflo prev	YELLOW	ROUND
GTB-G-3	NAT. GAS	Outside supply-3" line	2" bkflo prev	YELLOW	ROUND
GTB-G-4	NAT. GAS	at GUH-973A	1/2" bkflo prev	YELLOW	ROUND
GTB-G-5	NAT. GAS	at GUH-973B	1/2" bkflo prev	YELLOW	ROUND
GTB-G-6	NAT. GAS	at GUH-973C	1/2" bkflo prev	YELLOW	ROUND
GTB-G-7	NAT. GAS	at GUH-973D	1/2" bkflo prev	YELLOW	ROUND
GTB-G-8	NAT. GAS	at GUH973E	1/2" bkflo prev	YELLOW	ROUND
GTB-G-9	NAT. GAS	at GUH-973E	1/2" bkflo prev	YELLOW	ROUND
GTB-G-10	NAT. GAS	at GUH-973F	1/2" bkflo prev	YELLOW	ROUND
GTB-G-11	NAT. GAS	at GUH-973G	1/2" bkflo prev	YELLOW	ROUND
GTB-G-12	NAT. GAS	at GUH-973H	1/2" bkflo prev	YELLOW	ROUND
GTB-G-13	NAT. GAS	at GUH-973I	1/2" bkflo prev	YELLOW	ROUND
GTB-G-14	NAT. GAS	at GUH-974A	1/2" bkflo prev	YELLOW	ROUND
GTB-G-15	NAT. GAS	at GUH-974B	1/2" bkflo prev	YELLOW	ROUND
GTB-G-16	NAT. GAS	at GUH-975	1/2" bkflo prev	YELLOW	ROUND
GTB-G-17	NAT. GAS	Supply line at W. wall	3" bkflo prev	YELLOW	ROUND
GTB-G-18	NAT. GAS	Supply-lab at lockers	1/2" bkflo prev	YELLOW	ROUND
GTB-G-19	NAT.GAS	Supply-lab at lab hood	1/2" gate	YELLOW	ROUND
GTB-G-20	NAT. GAS	Supply-hot H20 heater	1/2" bkflo prev	YELLOW	ROUND
GTB-NPW-1	NONPOT. H20	Influent-syncroflo	4" butterfly	PINK	SQUARE
GTB-NPW-2	NONPOT. H20	Influent-NPW pump #3	1" gate	PINK	SQUARE
TB-NPW-2A	NONPOT. H20	Influent #1-Adjustment valve	Adj. Valv	PINK	SQUARE
GTB-NPW-3	NONPOT. H20	Influent-NPW pump #2	1" gate	PINK	SQUARE
GTB-NPW-3	NONPOT. H20	Influent#2-Adjustment valve	Adj. Valv	PINK	SQUARE
GTB-NPW-4	NONPOT. H20	Inlfuent-NPW Pump #3	1" gate	PINK	SQUARE
GTB-NPW-4	NONPOT. H20	Influent#3- Ajdustment. valve	Adj. Valv	PINK	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
GTB-NPW-5	NONPOT. H20	Effluent-NPW pump #3	1" gate	PINK	SQUARE
GTB-NPW-6	NONPOT. H20	Effluent-NPW pump #2	1" gate	PINK	SQUARE
GTB-NPW-7	NONPOT. H20	Effluent-NPW pump #1	1" gate	PINK	SQUARE
GTB-NPW-8	NONPOT. H20	Lead pressure gauge line	3/4" ball	PINK	SQUARE
GTB-NPW-9	NONPOT. H20	Lag pressure gauge line	3/4" ball	PINK	SQUARE
GTB-NPW-10	NONPOT. H20	Low suction gauge	3/4" ball	PINK	SQUARE
GTB-NPW-11	NONPOT. H20	Seal blowdown	3/4" gate	PINK	SQUARE
TB-NPW-11	NONPOT. H20	Purge-syncor flow	solenoid	PINK	SQUARE
GTB-NPW-12	NONPOT. H20	Pressure relief bypass	3/4" gate	PINK	SQUARE
GTB-NPW-13	NONPOT. H20	Pressure relief	3/4" gate	PINK	SQUARE
GTB-NPW-14	NONPOT. H20	Bottom tank drain	3/4" gate	PINK	SQUARE
GTB-NPW-15	NONPOT. H20	Hose reel connect at FeCl wall	2" ball	PINK	SQUARE
GTB-NPW-16	NONPOT. H20	Hose quick connect at GAC-552	2" ball	PINK	SQUARE
GTB-NPW-17	NONPOT. H20	Influent-booster pump	1-1/2" ball	PINK	SQUARE
GTB-NPW-18	NONPOT. H20	Bypass-booster pump	1-1/2" ball	PINK	SQUARE
GTB-NPW-19	NONPOT. H20	Effluent-booster pump	1-1/2" ball	PINK	SQUARE
GTB-NPW-20	NONPOT. H20	Effluent-booster pump	2" gate	PINK	SQUARE
GTB-NPW-21	NONPOT. H20	Pressure gauge-booster	3/4" ball	PINK	SQUARE
GTB-NPW-22	NONPOT. H20	Relief-booster pump	3/4" ball	PINK	SQUARE
GTB-NPW-23	NONPOT. H20	Main shutoff to CFP's	1" ball	PINK	SQUARE
GTB-NPW-24	NONPOT. H20	Influent-CFP-670	solenoid	PINK	SQUARE
GTB-NPW-25	NONPOT. H20	Pressure gauge-CFP-670	1" ball	PINK	SQUARE
GTB-NPW-26	NONPOT. H20	Pressure gauge-CFP-671	solenoid	PINK	SQUARE
GTB-NPW-27	NONPOT. H20	Influent-CFP-671	1" ball	PINK	SQUARE
GTB-NPW-28	NONPOT. H20	Hose reel conn. at booster pump	1" ball	PINK	SQUARE
GTB-NPW-29	NONPOT. H20	Influent to paddle mixerers	1-1/2" ball	PINK	SQUARE
GTB-NPW-30	NONPOT. H20	Influent to carbon silo	1-1/2" ball	PINK	SQUARE
GTB-NPW-31	NONPOT. H20	Influent to STB-NPW-4	6" ball	PINK	SQUARE
GTB-DCW-1	POT CLD H20	Influent-DCW-4-west wall	1-1/2" ball	BLACK	SQUARE
GTB-DCW-2	POT CLD H20	T off DCW-4 to hose connection	3/4" ball	BLACK	SQUARE
GTB-DCW-3	POT CLD H20	T off DCW-4 to hose connection	non-siphoning	BLACK	SQUARE
GTB-DCW-4	POT CLD H20	T off DCW-4 to hose connection	3/4" ball	BLACK	SQUARE
GTB-DCW-5	POT CLD H20	Supply-outside W. wall connec	1-1/2" ball	BLACK	SQUARE
GTB-DCW-6	POT CLD H20	Supply-ppe wall hose connec.	1-1/2" ball	BLACK	SQUARE
GTB-DCW-7	POT CLD H20	Supply-west wall hose connec.	1-1/2" ball	BLACK	SQUARE
GTB-DCW-8	POT CLD H20	Supply-south wall hose connec.	1-1/2" ball	BLACK	SQUARE
GTB-DCW-9	POT CLD H20	Supply-east wall connection	1-1/2" ball	BLACK	SQUARE
GTB-DCW-10	POT CLD H20	Supply-outside east wall connec	1-1/2" ball	BLACK	SQUARE
GTB-DCW-11	POT CLD H20	Supply-out. N.wall hose at FeCl	1-1/2" ball	BLACK	SQUARE
GTB-DCW-12	POT CLD H20	Supply-outside hose north wall	1-1/2" ball	BLACK	SQUARE
GTB-DCW-13	POT CLD H20	Hose connect-PPE area	3/4" gate	BLACK	SQUARE
GTB-DCW-14	POT CLD H20	Supply-janitor's sink (above)	1" ball	BLACK	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
GTB-DCW-15	POT CLD H20	Supply Saf-T-Flo	1" ball	BLACK	SQUARE
GTB-DCW-16	POT CLD H20	Supply bath/lab/break(abov bath)	1" ball	BLACK	SQUARE
GTB-DCW-17	POT CLD H20	Influent-hot water heater	1" ball	BLACK	SQUARE
GTB-DCW-18	POT CLD H21	Supply-toilet bathroom(west)	3/4" gate seat	BLACK	SQUARE
GTB-DCW-19	POT CLD H20	Supply-toilet bathroom(east)	3/4" gate	BLACK	SQUARE
GTB-DCW-20	POT CLD H20	Supply-bathroom sink(west)	3/4" gate	BLACK	SQUARE
GTB-DCW-21	POT CLD H20	Supply-bathroom sink(east)	3/4" gate	BLACK	SQUARE
GTB-DCW-22	POT CLD H20	Supply-breakroom sink	3/4" gate	BLACK	SQUARE
GTB-DCW-23	POT CLD H20	Supply-lab sink (NE)	3/4" gate	BLACK	SQUARE
GTB-DCW-24	POT CLD H20	Supply-lab sink(SW)	3/4" gate	BLACK	SQUARE
GTB-DCW-25	POT CLD H20	Supply-lab sink(W)	3/4" gate	BLACK	SQUARE
GTB-DHW-1	POT HOT H20	Effluent-hot water heater	1" ball	YELLOW	SQUARE
GTB-DHW-2	POT HOT H20	Influ.to Saf-T-Flo(above head)	1" ball	YELLOW	SQUARE
GTB-DHW-3	POT HOT H20	Supply sinks/back connecs.	1" ball	YELLOW	SQUARE
GTB-DHW-4	POT HOT H20	Supply-bath/lab/break	1" ball	YELLOW	SQUARE
GTB-DHW-5	**NO VALVE**				
GTB-DHW-6	POT HOT H20	Supply-bathroom sink	3/4" gate	YELLOW	SQUARE
GTB-DHW-7	POT HOT H20	Supply-bathroom sink	3/4" gate	YELLOW	SQUARE
GTB-DHW-8	POT HOT H20	Supply-breakroom sink	3/4" gate	YELLOW	SQUARE
GTB-DHW-9	POT HOT H20	Supply-lab sink	3/4" gate	YELLOW	SQUARE
GTB-DHW-1	POT HOT H20	Supply-lab sink	3/4" gate	YELLOW	SQUARE
GTB-DHW-1	POT HOT H20	Supply-lab sink	3/4" gate	YELLOW	SQUARE
GTB-TMP-1	TEMP. H20	Effluent-Saf-T-Flo	1" ball	AQUA	SQUARE
GTB-TMP-2	TEMP. H20	Safety eyewash/shower NPDES	1" ball	AQUA	SQUARE
GTB-TMP-3	TEMP. H20	Safety eyewash/shower-lab	1" ball	AQUA	SQUARE
GTB-CA-1	COMP. AIR	Inlet-cooler AC-901A	1" ball	DARK BLUE	SQUARE
GTB-CA-2	COMP. AIR	Inlet-cooler AC-901B	1" ball	DARK BLUE	SQUARE
GTB-CA-3	COMP. AIR	Tank shutoff-AC-901	1" ball	DARK BLUE	SQUARE
GTB-CA-4	COMP. AIR	Condensation drain shutoff	1/2" ball	DARK BLUE	SQUARE
GTB-CA-5	COMP. AIR	Press. relief-side A-cylin.-right	1/4" popoff	DARK BLUE	SQUARE
GTB-CA-6	COMP. AIR	Press. relief-side A-cylin.-mid.	1/4" popoff	DARK BLUE	SQUARE
GTB-CA-7	COMP. AIR	Press. relief-side A-seal air-mid.	1/4" adjust	DARK BLUE	SQUARE
GTB-CA-8	COMP. AIR	Press. relief- air cooler A	1/4" popoff	DARK BLUE	SQUARE
GTB-CA-9	COMP. AIR	Press. relief-side B-cylin.-right	1/4" popoff	DARK BLUE	SQUARE
GTB-CA-10	COMP. AIR	Press. relief-side B-cylin. mid	1/4" popoff	DARK BLUE	SQUARE
GTB-CA-11	COMP. AIR	Press. relief-side B-seal air-mid.	1/4" adjust	DARK BLUE	SQUARE
GTB-CA-12	COMP. AIR	Press. relief- air cooler B	1/4" popoff	DARK BLUE	SQUARE
GTB-CA-13	COMP. AIR	Press. relief- tank	1/4" popoff	DARK BLUE	SQUARE
GTB-CA-13A	COMP. AIR	Supply-all lines-after tank	1" ball	DARK BLUE	SQUARE
GTB-CA-13B	COMP. AIR	AC901tank drain(beneath	1/4" pepcock	DARK BLUE	SQUARE

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
GTB-CA-14	COMP. AIR	Supply CFP's/etc. before gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-15	COMP. AIR	Supply CFP's/etc. after gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-16	COMP. AIR	Supply-connect. at GAC's-552	2" ball	DARK BLUE	SQUARE
GTB-CA-17	COMP. AIR	Supply-CFP's	1" ball	DARK BLUE	SQUARE
GTB-CA-18	COMP. AIR	Supply-CFP-670-before sol.	1" ball	DARK BLUE	SQUARE
GTB-CA-19	COMP. AIR	Supply CFP-670	solenoid	DARK BLUE	SQUARE
GTB-CA-20	COMP. AIR	Supply-660 air dampener	3/4" ball	DARK BLUE	SQUARE
GTB-CA-21	COMP. AIR	Supply-CFP-671-before sol.	1" ball	DARK BLUE	SQUARE
GTB-CA-22	COMP. AIR	Supply CFP-671	solenoid	DARK BLUE	SQUARE
GTB-CA-23	COMP. AIR	Supply-671 air dampener	3/4" ball	DARK BLUE	SQUARE
GTB-CA-24	COMP. AIR	Supply-carbon silo(above)	3/4" ball	DARK BLUE	SQUARE
GTB-CA-25	COMP. AIR	Supply-2.5"conn-behind GAC551	1-1/2" ball	DARK BLUE	SQUARE
GTB-CA-26	COMP. AIR	Supply-lab/etc.- before gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-27	COMP. AIR	Supply-lab/etc.- after gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-28	COMP. AIR	Supply-connect. at FeCl2 wall	1-1/2" ball	DARK BLUE	SQUARE
GTB-CA-29	COMP. AIR	Supply-2.5"conn.-GAC551	1-1/2" ball	DARK BLUE	SQUARE
GTB-CA-30	COMP. AIR	Supply-lab-above bathroom	3/4" ball	DARK BLUE	SQUARE
GTB-CA-31	COMP. AIR	Supply-lab-at hood	1/2" gate	DARK BLUE	SQUARE
GTB-CA-32	COMP. AIR	Supply-spare- before gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-33	COMP. AIR	Supply-spare-after gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-34	COMP. AIR	Supply-NPDES/etc-before gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-35	COMP. AIR	Supply-NPDES/etc-after gauge	3/4" ball	DARK BLUE	SQUARE
GTB-CA-36	COMP. AIR	Supply- connect at bathroom	3/4" ball	DARK BLUE	SQUARE
GTB-CA-37	COMP. AIR	Supply- connect at GAC-551	3/4" ball	DARK BLUE	SQUARE
GTB-CA-38	COMP. AIR	Supply-NPDES	3/4" ball	DARK BLUE	SQUARE
GTB-CA-39	COMP. AIR	Supply-connect south wall	3/4" ball	DARK BLUE	SQUARE
GTB-CA-40	COMP. AIR	Supply-NFT-401 MOV	3/4" ball	DARK BLUE	SQUARE
GTB-CA-41	COMP. AIR	Supply-connect.-west wall	3/4" ball	DARK BLUE	SQUARE
GTB-CA-42	COMP. AIR	Supply-all tertiaries-after tank	3/4" ball	DARK BLUE	SQUARE
GTB-CA-43	COMP. AIR	Supply-north tertiary-lift control	3/4" ball	DARK BLUE	SQUARE
GTB-CA-44	COMP. AIR	Lift control at meter a	3/4" ball	DARK BLUE	SQUARE
GTB-CA-45	COMP. AIR	Lift control at meter b	3/4" ball	DARK BLUE	SQUARE
GTB-CA-46	COMP. AIR	Supply-middle tertiary-lift cont.	3/4" ball	DARK BLUE	SQUARE
GTB-CA-47	COMP. AIR	Lift control at meter a	3/4" ball	DARK BLUE	SQUARE
GTB-CA-48	COMP. AIR	Lift control at meter b	3/4" ball	DARK BLUE	SQUARE
GTB-CA-49	COMP. AIR	Supply-south tertiary-lift cont.	3/4" ball	DARK BLUE	SQUARE
GTB-CA-50	COMP. AIR	Lift control at meter a	3/4" ball	DARK BLUE	SQUARE
GTB-CA-51	COMP. AIR	Lift control at meter b	3/4" ball	DARK BLUE	SQUARE
GTB-CA-52	COMP. AIR	Supply from Blower Bldg.	3/4" ball	DARK BLUE	SQUARE
GTB-CA-53	COMP. AIR	Air pressure gauge on tank	1/2" ball	DARK BLUE	SQUARE

V-603	FERRIC CHL.	Tank fill connect at wall	2" ball	PURPLE	ROUND
GTB-FE-1	FERRIC CHL.	Pressure relief line-above tank	1" ball	PURPLE	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
GTB-FE-2	FERRIC CHL.	Liquid level indicator	4" gate	PURPLE	ROUND
GTB-FE-3	FERRIC CHL.	Secondary connect-at floor	2" ball	PURPLE	ROUND
GTB-FE-4	FERRIC CHL.	Tank discharge to pumps	1" ball	PURPLE	ROUND
V-600A	FERRIC CHL.	Sample connection FCP-600	3/4" ball	PURPLE	ROUND
V-600B	FERRIC CHL.	Influent FCP-600	1" ball	PURPLE	ROUND
V-600C	FERRIC CHL.	Calibr.column-top-FCP-600	3/4" ball	PURPLE	ROUND
V-600D	FERRIC CHL.	Calibr.column-bott.-FCP-600	3/4" ball	PURPLE	ROUND
V-600E	FERRIC CHL.	Relief valve line-bypass	3/4" ball	PURPLE	ROUND
V-600F	FERRIC CHL.	Relief valve line-after back pres.	3/4" ball	PURPLE	ROUND
GTB-FE-5	FERRIC CHL.	Pulsation dampener-FCP 600	3/4" ball	PURPLE	ROUND
GTB-FE-6	FERRIC CHL.	Relief valve line-before relief	3/4" ball	PURPLE	ROUND
GTB-FE-7	FERRIC CHL.	Relief valve line	relief	PURPLE	ROUND
BPV-600G	FERRIC CHL.	Relief valve line	back pres. relie	PURPLE	ROUND
V-601A	FERRIC CHL.	Sample connection-FCP-601	3/4" ball	PURPLE	ROUND
V-601B	FERRIC CHL.	Influent FCP-601	1" ball	PURPLE	ROUND
V-601C	FERRIC CHL.	Calibration column-top-FCP-601	3/4" ball	PURPLE	ROUND
V-601D	FERRIC CHL.	Calibration column-bot-FCP-601	3/4" ball	PURPLE	ROUND
V-601E	FERRIC CHL.	Relief valve line-bypass	3/4" ball	PURPLE	ROUND
V-601F	FERRIC CHL.	Relief valve line-after back pres.	3/4" ball	PURPLE	ROUND
GTB-FE-8	FERRIC CHL.	Pulsation dampener-FCP 601	3/4" ball	PURPLE	ROUND
GTB-FE-9	FERRIC CHL.	Relief valve line-before relief	3/4" ball	PURPLE	ROUND
GTB-FE-10	FERRIC CHL.	Relief valve line	relief	PURPLE	ROUND
BPV-601G	FERRIC CHL.	Relief valve line	back pres. relie	PURPLE	ROUND
GTB-FE-26	FERRIC CHL.	Influent port to process water	3/4" ball	PURPLE	ROUND
V-633	PHOS. ACID	Tank fill connect at wall	2" ball	PURPLE	ROUND
V-634A	PHOS. ACID	Overflow vent	1" ball	PURPLE	ROUND
V-634B	PHOS. ACID	Overflow drain	1" ball	PURPLE	ROUND
GTB-PA-1	PHOS. ACID	Pressure relief line-above tank	1" ball	PURPLE	ROUND
GTB-PA-2	PHOS. ACID	Secondary connect at floor	2" ball	PURPLE	ROUND
GTB-PA-3	PHOS. ACID	Tank discharge to pumps	1" ball	PURPLE	ROUND
V-631A	PHOS. ACID	Influent PAP-631	3/4" ball	PURPLE	ROUND
V-631B	PHOS. ACID	Sample connection PAP-631	3/4" ball	PURPLE	ROUND
V-631C	PHOS. ACID	Calibration-bottom-PAP-631	3/4" ball	PURPLE	ROUND
V-631D	PHOS. ACID	Calibration-top-PAP-631	3/4" ball	PURPLE	ROUND
V-631E	PHOS. ACID	Relief valve line-bypass	3/4" ball	PURPLE	ROUND
V-631F	PHOS. ACID	Relief valve line-after back pres.	3/4" ball	PURPLE	ROUND
V-631H	PHOS. ACID	Discharge-PAP-631	3/4" ball	PURPLE	ROUND
V-631G	PHOS. ACID	Discharge Bypass-PAP-631	3/4" ball	PURPLE	ROUND
GTB-PA-4	PHOS. ACID	Pulsation dampener-PAP 631	3/4" ball	PURPLE	ROUND
GTB-PA-5	PHOS. ACID	Relief valve line-before relief	3/4" ball	PURPLE	ROUND
GTB-PA-6	PHOS. ACID	Relief valve line	relief	PURPLE	ROUND
BPV-6731I	PHOS. ACID	Relief valve line	back pres. relie	PURPLE	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
V-630A	PHOS. ACID	Influent-PAP630	3/4" ball	PURPLE	ROUND
V-630B	PHOS. ACID	Sample connection PAP630	3/4" ball	PURPLE	ROUND
V-630C	PHOS. ACID	Calibration-bottom-PAP630	3/4" ball	PURPLE	ROUND
V-630D	PHOS. ACID	Calibration-top-PAP630	3/4" ball	PURPLE	ROUND
V-630E	PHOS. ACID	Relief valve line-bypass	3/4" ball	PURPLE	ROUND
V-630F	PHOS. ACID	Relief valve line-after back pres	3/4" ball	PURPLE	ROUND
GTB-PA-7	PHOS. ACID	Pulsation dampener-PAP630	3/4" ball	PURPLE	ROUND
GTB-PA-8	PHOS. ACID	Relief valve line-before relief	3/4" ball	PURPLE	ROUND
GTB-PA-9	PHOS. ACID	Relief valve line	relief	PURPLE	ROUND
BPV-630I	PHOS. ACID	Relief valve line	back pres. relie	PURPLE	ROUND
V-632A	PHOS. ACID	Influent-PAP632	3/4" ball	PURPLE	ROUND
V-632B	PHOS. ACID	Sample connection-PAP632	3/4" ball	PURPLE	ROUND
V-632C	PHOS. ACID	Calibration-bottom-PAP632	3/4" ball	PURPLE	ROUND
V-632D	PHOS. ACID	Calibration-top-PAP632	3/4" ball	PURPLE	ROUND
V-632E	PHOS. ACID	Relief valve line-bypass	3/4" ball	PURPLE	ROUND
V-632F	PHOS. ACID	Relief valve line-after back pres.	3/4" ball	PURPLE	ROUND
V-632H	PHOS. ACID	Discharge-PAP632	3/4" ball	PURPLE	ROUND
V-632G	PHOS. ACID	Discharge Bypass-PAP632	3/4" ball	PURPLE	ROUND
GTB-PA-10	PHOS. ACID	Pulsation dampener-PAP632	3/4" ball	PURPLE	ROUND
GTB-PA-11	PHOS. ACID	Relief valve line-before relief	3/4" ball	PURPLE	ROUND
GTB-PA-12	PHOS. ACID	Relief valve line	relief	PURPLE	ROUND
BPV-632I	PHOS. ACID	Relief valve line	back pres. relie	PURPLE	ROUND
V-308	TRD H20	DAS/PACT bypass	10" ball	BROWN	ROUND
V-410	TRD H20	Influent-NFT-401	10" butterfly	BROWN	ROUND
GTB-TW-1	TRD H20	Small tank drain-NFT-401	3" butterfly	BROWN	ROUND
GTB-TW-2	TRD H20	Liquid level indicator-NFT-401	4" gate	BROWN	ROUND
V-510A	TRD H20	Influent-TP-510	10" butterfly	BROWN	ROUND
V-510B	TRD H20	Effluent-TP-510	6" check	BROWN	ROUND
MOV-510C	TRD H20	Effluent-TP-510	4" butterfly	BROWN	ROUND
GTB-TW-3	TRD H20	Influent-TP-510 pressure gauge	1/2"ball	BROWN	ROUND
GTB-TW-4	TRD H20	Effluent-TP-510 pressure gauge	1/2"ball	BROWN	ROUND
V-511A	TRD H20	Influent-TP-511	10" butterfly	BROWN	ROUND
V-511B	TRD H20	Effluent-TP-510	6" check	BROWN	ROUND
MOV-511C	TRD H20	Effluent-TP-511	4" butterfly	BROWN	ROUND
GTB-TW-5	TRD H20	Influent-TP-511-pressure gauge	3/4" ball	BROWN	ROUND
GTB-TW-6	TRD H20	Effluent-TP-511-pressure gauge	3/4" ball	BROWN	ROUND
GTB-TW-7	TRD H20	Effluent-TP-511	6" check	BROWN	ROUND
V-521	TRD H20	Influent-TF-521	8" butterfly	BROWN	ROUND
GTB-TW-8	TRD H20	Influent-TF-521	6" knife	BROWN	ROUND
GTB-TW-9	TRD H20	Tank drain-screened-TF-521	1-1/4" ball	BROWN	ROUND
GTB-TW-10	TRD H20	Tank drain-TF-521	2" ball	BROWN	ROUND
V-522	TRD H20	Influent-TF-522	8" butterfly	BROWN	ROUND
GTB-TW-11	TRD H20	Influent-TF-522	6" knife	BROWN	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
GTB-TW-12	TRD H20	Tank drain-screened-TF-522	1-1/4" ball	BROWN	ROUND
GTB-TW-13	TRD H20	Tank drain-TF-522	2" ball	BROWN	ROUND
V-523	TRD H20	Influent-TF-523	8" butterfly	BROWN	ROUND
GTB-TW-14	TRD H20	Influent-TF-523	6" knife	BROWN	ROUND
GTB-TW-15	TRD H20	Tank drain-screened-TF-523	1-1/4" ball	BROWN	ROUND
GTB-TW-16	TRD H20	Tank drain-TF-523	2" ball	BROWN	ROUND
V-528	TRD H20	Tertiary bypass	6" butterfly	BROWN	ROUND
V-527	TRD H20	Tertiary bypass-after flowmeter	6" butterfly	BROWN	ROUND
V-531	TRD H20	Influent-ET-531	12" butterfly	BROWN	ROUND
V-532	TRD H20	Drain-ET-531	4" butterfly	BROWN	ROUND
GTB-TW-17	TRD H20	Liquid level indicator	3" gate	BROWN	ROUND
V-540A	TRD H20	Effluent-ET-531/Influ. DP-540	8" butterfly	BROWN	ROUND
GTB-TW-18	TRD H20	Influent-DP-540-press. gauge	3/4" ball	BROWN	ROUND
GTB-TW-19	TRD H20	Effluent-DP-540-press. gauge	3/4" ball	BROWN	ROUND
V-540B	TRD H20	Effluent-DP-540	8" check	BROWN	ROUND
MOV-540C	TRD H20	Effluent-DP-540	8" butterfly	BROWN	ROUND
V-541A	TRD H20	Effluent-ET-531/Influ. DP-541	8" butterfly	BROWN	ROUND
GTB-TW-20	TRD H20	Influent-DP-541-press. gauge	3/4" ball	BROWN	ROUND
GTB-TW-21	TRD H20	Effluent-ET-541-press. gauge	3/4" ball	BROWN	ROUND
V-541B	TRD H20	Effluent-DP-541	8" check	BROWN	ROUND
MOV-541C	TRD H20	Effluent-ET-541	8" butterfly	BROWN	ROUND
GTB-TW-22	TRD H20	Effluent-back to NFT-401	8" butterfly	BROWN	ROUND
V-554	TRD H20	Effluent-GAC Bypass	6" butterfly	BROWN	ROUND
V-561	TRD H20	Influent Bypass-NMS-561	6" butterfly	BROWN	ROUND
GTB-TW-23	TRD H20	Infl.relief GAC-552 before gauge	3/4" ball	BROWN	ROUND
V-GAC-552	TRD H20	Influent to GAC 552A&B	6" butterfly	BROWN	ROUND
V-552A	TRD H20	Influent GAC-552b	8" butterfly	BROWN	ROUND
V-552B	TRD H20	Influent GAC-552a	8" butterfly	BROWN	ROUND
V-552C	TRD H20	Effluent GAC-552b	8" butterfly	BROWN	ROUND
V-552D	TRD H20	Effluent GAC-552a	8" butterfly	BROWN	ROUND
V-552E	TRD H20	Backwash GAC-552b	8" butterfly	BROWN	ROUND
V-552F	TRD H20	Backwash GAC-552a	8" butterfly	BROWN	ROUND
V-552G	TRD H20	Bottom line GAC-552b	8" butterfly	BROWN	ROUND
V-552H	TRD H20	Bottom line GAC-552a	8" butterfly	BROWN	ROUND
V-552J	TRD H20	Bypass line GAC-552b	8" butterfly	BROWN	ROUND
V-552K	TRD H20	Bypass line GAC-552a	8" butterfly	BROWN	ROUND
V-552L	TRD H20	Carbon discharge-GAC552b	4" ball	BROWN	ROUND
V-552M	TRD H20	Carbon discharge-GAC552a	4" ball	BROWN	ROUND
V-552N	TRD H20	Carbon fill-GAC552b	4" ball	BROWN	ROUND
V-552P	TRD H20	Carbon fill-GAC552a	4" ball	BROWN	ROUND
V-552R	TRD H20	Flush conn. GAC-552b	2" ball	BROWN	ROUND
V-552S	TRD H20	Flush conn. GAC-552a	2" ball	BROWN	ROUND
V-552T	TRD H20	Flush conn. 552b carbon fill	3/4" ball	BROWN	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
V-552U	TRD H20	Flush conn. 552b carbon fill	3/4" ball	BROWN	ROUND
V-552V	TRD H20	Flush conn. 552b carbon disch.	3/4" ball	BROWN	ROUND
V-552W	TRD H20	Flush conn. 552a carbon fill	3/4" ball	BROWN	ROUND
V-552X	TRD H20	Flush conn. 552a carbon fill	3/4" ball	BROWN	ROUND
V-552Y	TRD H20	Flush conn. 552a carbon disch.	3/4" ball	BROWN	ROUND
V-552AB	TRD H20	At PI-552C	3/4" ball	BROWN	ROUND
V-552AD	TRD H20	At PI-552B	3/4" ball	BROWN	ROUND
V-552AF	TRD H20	AT PI-552A	3/4" ball	BROWN	ROUND
V-552AG	TRD H20	At PDS-552B	3/4" ball	BROWN	ROUND
V-552AH	TRD H20	At PDS-552B (middle)	3/4" ball	BROWN	ROUND
V-552AJ	TRD H20	At PDS-552A	3/4" ball	BROWN	ROUND
V-552AK	TRD H20	At PDS-552A	3/4" ball	BROWN	ROUND
GTB-TW-24	TRD H20	Effl. relief GAC-552-above	3/4" ball	BROWN	ROUND
GTB-TW-25	TRD H20	Infl. relief GAC-552-above	3/4" ball	BROWN	ROUND
GTB-TW-26	TRD H2)	Infl. relief GAC-551 after gauge	3/4" ball	BROWN	ROUND
V-GAC-551	TRD H20	Influent to GAC 551A&B	6" butterfly	BROWN	ROUND
V-551A	TRD H20	Influent GAC-551b	8" butterfly	BROWN	ROUND
V-551B	TRD H20	Influent GAC-551a	8" butterfly	BROWN	ROUND
V-551C	TRD H20	Effluent GAC-551b	8" butterfly	BROWN	ROUND
V-551D	TRD H20	Effluent GAC-551a	8" butterfly	BROWN	ROUND
V-551E	TRD H20	Backwash GAC-551b	8" butterfly	BROWN	ROUND
V-551F	TRD H20	Backwash GAC-551a	8" butterfly	BROWN	ROUND
V-551G	TRD H20	Bottom line GAC-551b	8" butterfly	BROWN	ROUND
V-551H	TRD H20	Bottom line GAC-551a	8" butterfly	BROWN	ROUND
V-551J	TRD H20	Bypass line GAC-551b	8" butterfly	BROWN	ROUND
V-551K	TRD H20	Bypass line GAC-551a	8" butterfly	BROWN	ROUND
V-551L	TRD H20	Carbon discharge-GAC551b	4" ball	BROWN	ROUND
V-551M	TRD H20	Carbon discharge-GAC551a	4" ball	BROWN	ROUND
V-551N	TRD H20	Carbon fill-GAC551b	4" ball	BROWN	ROUND
V-551P	TRD H20	Carbon fill-GAC551a	4" ball	BROWN	ROUND
V-551R	TRD H20	Flush conn. GAC-551b	2" ball	BROWN	ROUND
V-551S	TRD H20	Flush conn. GAC-551a	2" ball	BROWN	ROUND
V-551T	TRD H20	Flush conn. 551b carbon fill	3/4" ball	BROWN	ROUND
V-551U	TRD H20	Flush conn. 551b carbon fill	3/4" ball	BROWN	ROUND
V-551V	TRD H20	Flush conn. 551b carbon disch.	3/4" ball	BROWN	ROUND
V-551W	TRD H20	Flush conn. 551a carbon fill	3/4" ball	BROWN	ROUND
V-551X	TRD H20	Flush conn. 551a carbon fill	3/4" ball	BROWN	ROUND
V-551Y	TRD H20	Flush conn. 551a carbon disch.	3/4" ball	BROWN	ROUND
V-551AB	TRD H20	At PI-551C	3/4" ball	BROWN	ROUND
V-551AD	TRD H20	At PI-551B	3/4" ball	BROWN	ROUND
V-551AF	TRD H20	AT PI-551A	3/4" ball	BROWN	ROUND
V-551AG	TRD H20	At PDS-551B	3/4" ball	BROWN	ROUND
V-551AH	TRD H20	At PDS-551B	3/4" ball	BROWN	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
V-551AJ	TRD H20	At PDS-551A	3/4" ball	BROWN	ROUND
V-551AK	TRD H20	At PDS-551A	3/4" ball	BROWN	ROUND
V-553A	TRD H20	Connection line-GAC-553	1-1/2" ball	BROWN	ROUND
V-553B	TRD H20	Connection line GAC-553	1-1/2" check	BROWN	ROUND
V-553C	TRD H20	Overflow-before pres.gauge-553	1/2" ball	BROWN	ROUND
V-553D	TRD H20	Overflow-after pres.gauge-553	1-1/2" check	BROWN	ROUND
V-553E	TRD H20	Overflow-after pres.gauge-553	1-1/2" ball	BROWN	ROUND
V-553F	TRD H20	Overflow GAC-553	3" ball	BROWN	ROUND
V-553G	TRD H20	Carbon discharge GAC-553	4" ball	BROWN	ROUND
V-553J	TRD H20	Carbon fill GAC-553	4" ball	BROWN	ROUND
V-553L	TRD H20	Flush connect.553 carbon fill	3/4" ball	BROWN	ROUND
GTB-TW-27	TRD H20	Infl.relief NMS-561 bef. meter	3/4" ball	BROWN	ROUND
GTB-TW-27A	TRD H20	NPDES Hose sampler	3/4" ball	BROWN	ROUND
GTB-TW-28	TRD H20	pH meter NMS-561	3/4" ball	BROWN	ROUND
GTB-TW-29	TRD H20	Conductivity meter NMS-561	3/4" ball	BROWN	ROUND
GTB-TW-30	TRD H20	Quick conn.-dischar.-trans. tank	3/4" ball	BROWN	ROUND
GTB-TW-31	TRD H20	Air connect-carb. fill -trans tank	3/4" ball	BROWN	ROUND
GTB-SP-1	SMPL. PORT	Sample port #10-TP-510	3/4" ball	ORANGE	SQUARE
GTB-SP-2	SMPL.. PORT	Sample port #10-TP-511	3/4" ball	ORANGE	SQUARE
GTB-SP-3	SMPL. PORT	Sample port-knife valve-TF-521	3/4" ball	ORANGE	SQUARE
GTB-SP-4	SMPL. PORT	Sample port-knife valve-TF-522	3/4" ball	ORANGE	SQUARE
GTB-SP-5	SMPL. PORT	Sample port-knife valve-TF-523	3/4" ball	ORANGE	SQUARE
GTB-SP-6	SMPL. PORT	Influent-ET-531	3/4" ball	ORANGE	SQUARE
GTB-SP-7	SMPL. PORT	Influent-ET-540 sample port	3/4" ball	ORANGE	SQUARE
GTB-SP-8	SMPL. PORT	Influent-ET-541 sample port	3/4" ball	ORANGE	SQUARE
GTB-SP-9	SMPL PORT	At sample port before PI-552C	3/4" ball	ORANGE	SQUARE
GTB-SP-10	SMPL PORT	At sample port before PI-552B	3/4" ball	ORANGE	SQUARE
GTB-SP-11	SMPL PORT	At sample port before PI-552A	3/4" ball	ORANGE	SQUARE
GTB-SP-12	SMPL PORT	At sample port before PI-551C	3/4" ball	ORANGE	SQUARE
GTB-SP-13	SMPL PORT	At sample port before PI-551B	3/4" ball	ORANGE	SQUARE
GTB-SP-14	SMPL PORT	At sample port before PI-551A	3/4" ball	ORANGE	SQUARE
GTB-SP-15	SMPL PORT	Hose grab-sample port NMS-561	3/4" ball	ORANGE	SQUARE
GTB-PAC-1	P.A. CARBON	Influent CFP-670	3" ball	PURPLE	ROUND
GTB-PAC-2	P.A. CARBON	Influent press. gauge CFP-670	3/4" ball	PURPLE	ROUND
GTB-PAC-3	P.A. CARBON	Influent relief CFP-670	3/4" ball	PURPLE	ROUND
GTB-PAC-4	P.A. CARBON	Influent relief CFP-670	3/4" ball	PURPLE	ROUND
GTB-PAC-5	P.A. CARBON	Discharge to PCT-201	3" ball	PURPLE	ROUND
GTB-PAC-6	P.A. CARBON	Bypass to PCT- 202/201	3" ball	PURPLE	ROUND
GTB-PAC-7	P.A. CARBON	Discharge to PCT-201	3" ball	PURPLE	ROUND
GTB-PAC-8	P.A. CARBON	Flush on PCT-201 line	1" ball	PURPLE	ROUND
GTB-PAC-9	P.A. CARBON	Influent CFP-671	3" ball	PURPLE	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
GTB-PAC-10	P.A. CARBON	Influent press. gauge CFP-671	3/4" ball	PURPLE	ROUND
GTB-PAC-11	P.A. CARBON	Influent relief CFP-671	3/4" ball	PURPLE	ROUND
GTB-PAC-12	P.A. CARBON	Influent relief CFP-671	3/4" ball	PURPLE	ROUND
GTB-PAC-13	P.A. CARBON	Discharge to PCT-202	3" ball	PURPLE	ROUND
GTB-PAC-14	P.A. CARBON	Discharge to PCT-202	3" ball	PURPLE	ROUND
GTB-PAC-15	P.A. CARBON	Flush on PCT-202 line	1" ball	PURPLE	ROUND
GTB-PAC-16	P.A. CARBON	Paddle mixer discharge to 201	1" ball	PURPLE	ROUND
GTB-PAC-17	P.A. CARBON	Paddle mixer bypass to 201/202	1" ball	PURPLE	ROUND
GTB-PAC-18	P.A. CARBON	Paddle mixer discharge to 201	1" ball	PURPLE	ROUND
GTB-PAC-19	P.A. CARBON	Paddle mixer discharge to 202	1" ball	PURPLE	ROUND
GTB-PAC-20	P.A. CARBON	Paddle mixer discharge to 202	1" ball	PURPLE	ROUND
GTB-PAC-21	P.A. CARBON	Effluent-paddle mixer #1	3/4" ball	PURPLE	ROUND
GTB-PAC-22	P.A. CARBON	Effluent-paddle mixer #1	Solenoid	PURPLE	ROUND
GTB-PAC-23	P.A. CARBON	Effluent-paddle mixer #2	3/4" ball	PURPLE	ROUND
GTB-PAC-24	P.A. CARBON	Effluent-paddle mixer #2	Solenoid	PURPLE	ROUND

GTB-TW-31	TRD RECYCLE	Effluent GTB-1 sump	4" check	RED	ROUND
GTB-TW-32	TRD RECYCLE	Effluent GTB-1 sump	3" ballseat	RED	ROUND
GTB-TW-33	TRD RECYCLE	Effluent GTB-2 sump	4" check	RED	ROUND
GTB-TW-34	TRD RECYCLE	Effluent GTB-2 sump	3" ballseat	RED	ROUND

SITE EFFLUENT

EFF-TRD-1	TRD H20	Plant effluent at 'T' (old)	10" gate	BROWN	ROUND
EFF-TRD-2	TRD H20	Plant recycle at 'T' (old)	10" gate	BROWN	ROUND
EFF-TRD-3	TRD H20	Effluent line shutoff at 'T' (old)	10" gate	BROWN	ROUND
EFF-TRD-4	TRD H20	Plant recycle at head (old)	10" gate	BROWN	ROUND
EFF-TRD-5	TRD H20	Plant effluent-before 'T' (new)	12" gate	BROWN	ROUND
EFF-TRD-6	TRD H20	A.R.V. shutoff-before River Rd.	3" ball	BROWN	ROUND
EFF-TRD-7	TRD H20	Air release valve-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-8	TRD H20	Air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-9	TRD H20	A.R.V. shutoff-after River Rd.	3" ball	BROWN	ROUND
EFF-TRD-10	TRD H20	Air release valve-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-11	TRD H20	Air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-12	TRD H20	A.R.V shutoff-rail-crossing	3" ball	BROWN	ROUND
EFF-TRD-13	TRD H20	Air release valve-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-14	TRD H20	Air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-15	TRD H20	A.R.V. shutoff-along Little Bear	3" ball	BROWN	ROUND
EFF-TRD-16	TRD H20	Air release valve-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-17	TRD H20	Effluent-air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-18	TRD H20	A.R.V.shutoff-before Russell Rd.	3" ball	BROWN	ROUND
EFF-TRD-19	TRD H20	Air release valve-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-20	TRD H20	Air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-21	TRD H20	A.R.V. shutoff-near Russell Rd.	3" ball	BROWN	ROUND

OTT/STORY SUPERFUND SITE
VALVE SCHEDULE

TAG FRONT	TAG BACK	IDENTIFICATION OF VALVE	TYPE VALVE	TAG COLOR	TAG SHAPE
EFF-TRD-22	TRD H20	Air release-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-23	TRD H20	Air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-24	TRD H20	A.R.V.shutoff-at Giles Rd.	3" ball	BROWN	ROUND
EFF-TRD-25	TRD H20	Air release valve-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-26	TRD H20	Air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-27	TRD H20	A.R.V. shutoff-before Holton Rd.	3" ball	BROWN	ROUND
EFF-TRD-28	TRD H20	Air release valve-hose connection	1-1/2" ball	BROWN	ROUND
EFF-TRD-29	TRD H20	Air release valve	3" air/vacuum	BROWN	ROUND
EFF-TRD-30	TRD H20	Effluent-isolation-before River Rd	12" gate	BROWN	ROUND
EFF-TRD-31	TRD H20	Effluent-isolation-at Little Bear	12" gate	BROWN	ROUND
EFF-TRD-32	TRD H20	Effluent-isolation-near Russell Rd.	12" gate	BROWN	ROUND
EFF-TRD-33	TRD H20	Effluent-isolation-at Giles Rd.	12" gate	BROWN	ROUND
EFF-TRD-34	TRD H20	Effluent-isolation-before Holton R	12" gate	BROWN	ROUND
EFF-TRD-37	TRD H20	Influent-oxycharger	12" gate	BROWN	ROUND
EFF-TRD-38	TRD H20	Bypass-oxycharger	12" gate	BROWN	ROUND
EFF-TRD-39	TRD H20	Discharge-oxycharger	12" gate	BROWN	ROUND
EFF-TRD-35	TRD H20	Discharge to river (old)	8" gate	BROWN	ROUND
EFF-TRD-36	TRD H20	Discharge to filtration plant (old)	8" gate	BROWN	ROUND

APPENDIX D

GWES and GWTF Equipment Reference Materials

The following documents are, by reference, part of the O&M Manual for the Ott/Story/Cordova Groundwater Extraction System and Groundwater Treatment Facility. Documents compiled and stored in file cabinets located on the Groundwater Treatment Building (GTB) mezzanine include:

Detailed design criteria (contract no. DACW45-93-C-0156)

As built drawings

Dimension prints

Approved shop drawings

Construction photos (3 volumes)

A list of laboratory chemicals, along with their Material Safety Data Sheets (MSDS's), is maintained in the Operator Office, in the possession of the facility Safety Officer.

Equipment manufacturers' manuals, including individual equipment O&M manuals, are maintained in files located in the Operator Office in the GTB. Specific O&M manuals are listed in the following pages and include the name of the company providing the equipment and the submittal number corresponding to each manual.

OTT/STORY/CORDOVA
O/M MANUAL LIST

Submittal #	Description	Company	Package
0277.0-11460-400	O&M Manual for GAC Syst.	Calgon Carbon Corporation	P-100
274.2-11430-1300	O&M Manual for Sludge Dewatering Syst.	JWI	P-102
365.5-11800-500	O&M Manual for NPDES Treatment Syst	Seeco	P-104
036.1-11440-1200	O&M Manual for Tertiary Filter	Andritz-Ruthner	P-105
647.2-11721-1100	O&M Manual for Lime Feed System	Zimpro Environmental	P-107
629.0-13122-1400	O&M Manual for Firewater Pump House Water System	ITT Pump/Broods	P-108
119.3-11310-1500	O&M Instructions for SP-131 A/B	IPECO	P-110
119.3-11310-300	O&M Instructions for SP-130 A	IPECO	P-110
119.3-11310-3600	O&M Instructions for SP-132	IPECO	P-110
073.3-11211-800	O&M Manuals for TP 510/511; DP 540/541	Goulds Pumps/BRI	P-111
359.1-11722-700	O&M Manual for PAC Feed Syst.	Chemical Metering System	P-122
300.0-11851-400	O&M Manual for DAS By-Pass Fans	Howden Fan	P-123
041.1-11310-2200	O&M Instructions for STP-211	IPECO	P-124
270.0-11310-2900	O&M Instructions for RSP-320	IPECO	P-124
270.0-11310-4300	O&M Instructions for RSP-220	IPECO	P-124
320.0-16902-600	O&M Instructions for SD-19	PermAlert	P-133
590.0-11720-600	O&M Manual for Chemical Feed Syst.	Wallace & Tiernan	P-134

OTT/STORY/CORDOVA
O/M MANUAL LIST

Submittal #	Description	Company	Package
302.6-11720-601	Ferric & Phosphoric O&M Manual for Chemical Feed Syst.	Stranco c/o Cowles Equipment.	P-138
516.1-11350-400	Polymer O&M Manual for Sludge Holding Tank & Mixer	Smith & Loveless	S-200
519.2-11740-600	O&M Manual for Sludge Collection Equip.	Smith & Loveless	S-200
151.3-02685-1100	Mich Con's Responsibility	Holwerda-Huizinga	S-204
749.0-11310-4510	O&M Man. for Norgren Pressure Regulator	Holwerda-Huizinga	S-204
749.0-11310-4520	O&M Manual for Wilden M8 Pump	Holwerda-Huizinga	S-204
749.0-11310-4530	Wilden SD2 Automatic Sur	Holwerda-Huizinga	S-204
554.0-15100-1301	O&M Manual for Plug Valves	Holwerda-Huizinga	S-204
474.0-15100-801	O&M Manual for Butterfly Valves	Holwerda-Huizinga	S-204
552.0-15400-1400	Water Booster System	Holwerda-Huizinga	S-204
553.0-15400-201	O&M Manual for Refrigerant Air Compressor	Holwerda-Huizinga	S-204
682.0-15400-202	O&M Manual for Air Compressor	Holwerda-Huizinga	S-204
557.0-15400-401	O&M Manual for Fixtures	Holwerda-Huizinga	S-204
587.1-15602-501	O&M Instructions for Gas-Fired Unit Heaters	Holwerda-Huizinga	S-204
582.1-15804-700	O&M Instructions for FRP Belt	Holwerda-Huizinga	S-204
583.1-15804-701	O&M Manual for Centrifugal In-Line Fan	Holwerda-Huizinga	S-204

OTT/STORY/CORDOVA
O/M MANUAL LIST

Submittal #	Description	Company	Package
592.1-15804-702	O&M Instructions for Tubeaxial, Vanaxial Fans	Holwerda-Huizinga	S-204
593.1-15804-703	O&M Instructions for Centrifugal Fans	Holwerda-Huizinga	S-204
575.1-15805-1700	O&M Instructions for McQuay Air Handlers	Holwerda-Huizinga	S-204
586.1-15805-1701	O&M Instructions for Duct Heaters	Holwerda-Huizinga	S-204
090.1-11730-700	O&M Manual for DAS Basins	Pittsburg Tank	S-206
454.1-16415-2900	O&M Instructions for Lighting Fixtures	Windemuller Electric	S-207
657.2-16721-1500	O&M Manual for Fire Alarm	Windemuller Electric	S-207
546.2-16901-400	O&M Manual for PLC Equipment Manual	Windemuller Electric	S-207
698.0-16901-602	O&M Manual for Auto. Remote Dialer	Windemuller Electric	S-207
618.1-14630-400	O&M Manual for 1 Ton Hoist	Stewart Engineering	S-211
619.1-14630-401	O&M Manual for 3 Ton Hoist	Stewart Engineering	S-211
248.0-11212-500	O&M Manual for Vertical Turbine Pump System	Contract Dewatering	S-212
665.0-09680-500	Maintenance Instructions for Conference Room Carpeting	Muskegon Tile	S-214
532.0-10440-700	Protection & Cleaning for Interior Signs (ASI Sign Systems)	Muskegon Quality Builders	S-220
702.0-16415-4001	O&M Manual for Electric Slide Gate	Reliable Overhead Door & Gate	S-230
-16402-2900	O&M Instructions for Power Cable	Windemuller Electric	S-207
794.0-11212?-2300	O&M Manual for MicroPurge Flow Cell System	QED	P-165

OTT/STORY/CORDOVA
O/M MANUAL LIST

Submittal #	Description (Sampling System for Wells)	Company	Package
0431.0-11303-500	Sewage Pumping Station	Kennedy Industries, Inc.	S-203
0552.0-15400-1400	Nonpotable Water System (SyncroFlow)	Holwerda-Huizinga	S204
0389.5-16900-300	Electric Freeze Protection	Windemuller (Prentice)	S207
0109.0-16415-1210	Motor Control Centers	Windemuller	S207
0111.0-16402-500/600	Electric Power Distribution Transformers	Windemuller	S207
0733.0-16402-2800	List of Equipment & Materials	Windemuller	S207
0228.0-16402-1800	Electrical Distribution & Lighting Systems	Windemuller	S207
0227.0-16402-1400	Non-Standard Light Fixtures	Windemuller	S207
0039.1-11430-1100	Acid Wash System (Filter Press)	JWI	P201
0673.0-13812-900	Flowmeters, Level Instruments	Windemuller	S207
0453.1-11825-200	Thermal Oxidation System O&M Manual	Huntington Energy Systems	P106
0546.2-16901-400	DCS	Windemuller	S207
0454.1-16415-2900	Electrical System O&M Instructions	Windemuller	S207

APPENDIX E

Pump Performance Curves

DATE

REV. DATE 8-9-84 ISSUE # 1

GOULDS PUMPS, INC.
SENECA FALLS NEW YORK 13148

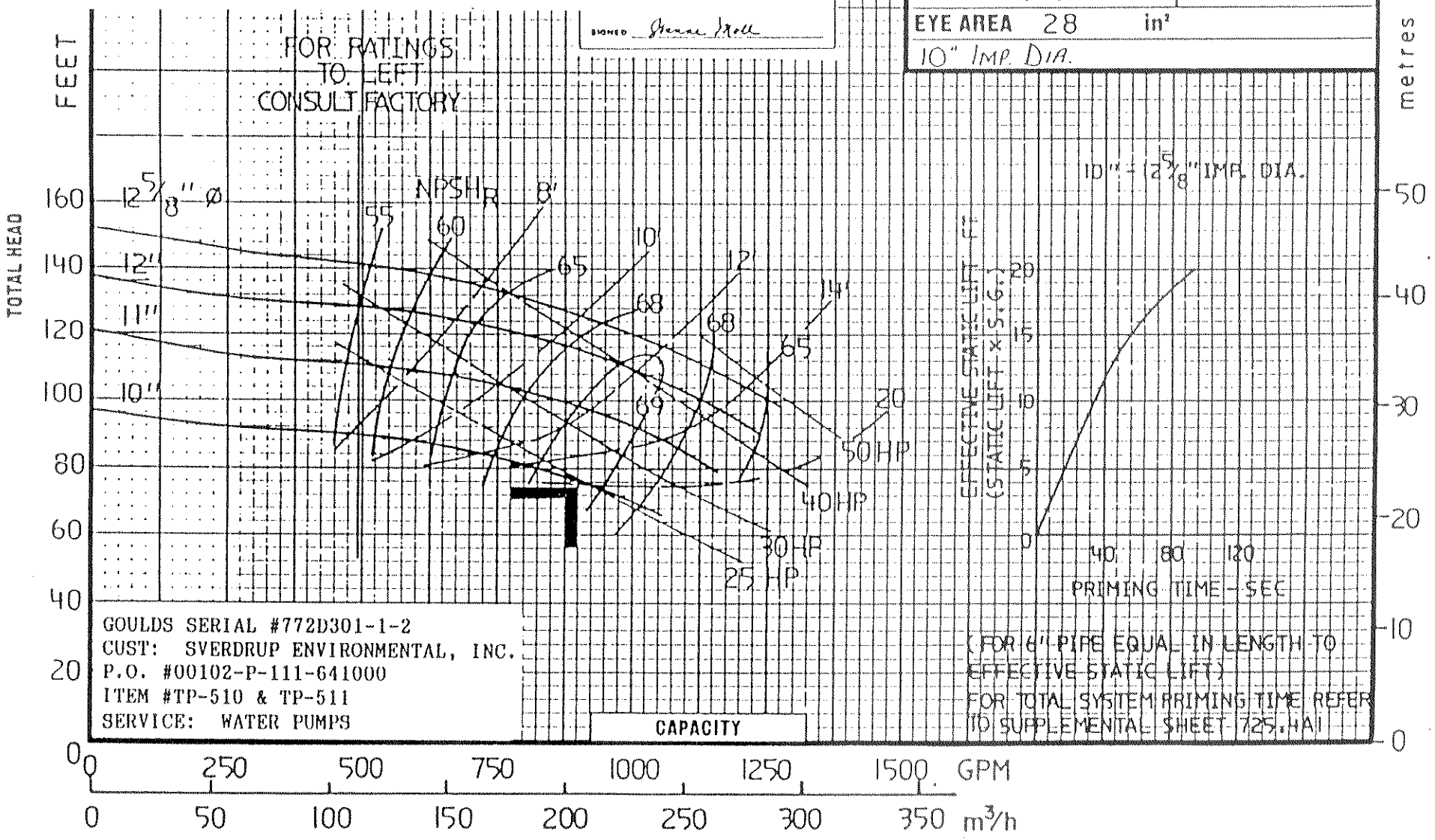
CENTRIFUGAL PUMP CHARACTERISTICS

RPM 1780 CDS 3127-1

MODEL 3796 MTX
SIZE 6 X 6 -13
IMP. DWG. 101-499 | STEEL 101-500
PATTERN 54611 | 54612
EYE AREA 28 in²
10" IMP. DIA.

Tertiary Feed Pumps
TP - 510 & 511

CERTIFIED PERFORMANCE DATA
GOULDS PUMPS, INC.
ENGINEERED PRODUCTS DIVISION
Seneca Falls, N. Y.
SIGNED Steve Kroll



GOULDS SERIAL #772D301-1-2
CUST: SVERDRUP ENVIRONMENTAL, INC.
P.O. #00102-P-111-641000
ITEM #TP-510 & TP-511
SERVICE: WATER PUMPS

DATE 8-25-64

2-19-92 ISS[illegible] YDA
TRACED, ME[illegible] ADDED 8-15-74 PAD
REV. DATE 1-8-87 ISSUE #1

9-13-93 ISSUE # 4

GOULDS PUMPS, INC.
SENECA FALLS, NEW YORK 13148

CENTRIFUGAL PUMP CHARACTERISTICS

RPM 1780 CDS 1786 - 4

MODEL 3196 10.375" IMP. DIA

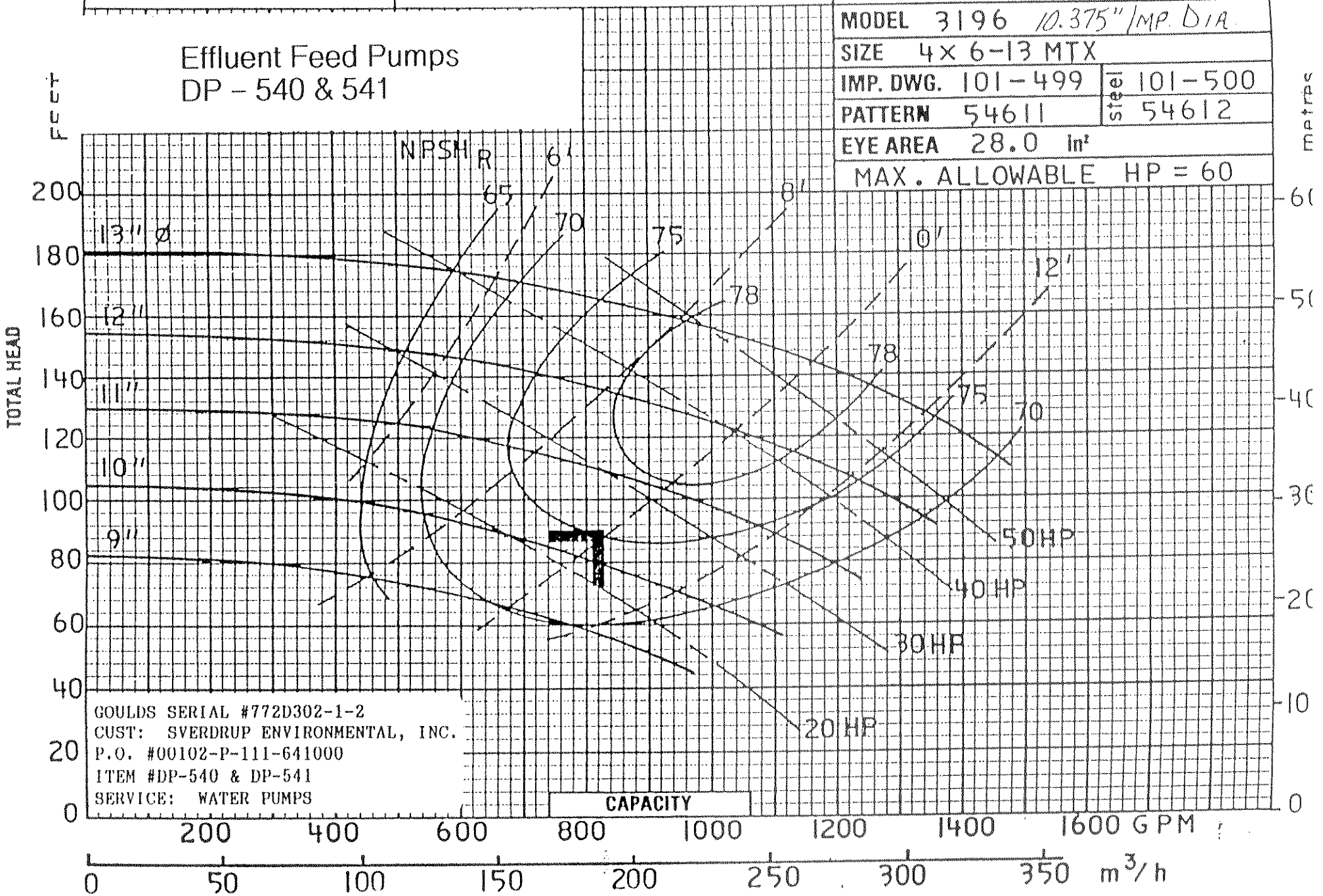
SIZE 4 x 6-13 MTX

IMP. DWG. 101-499 steel 101-500

PATTERN 54611 54612

EYE AREA 28.0 in²

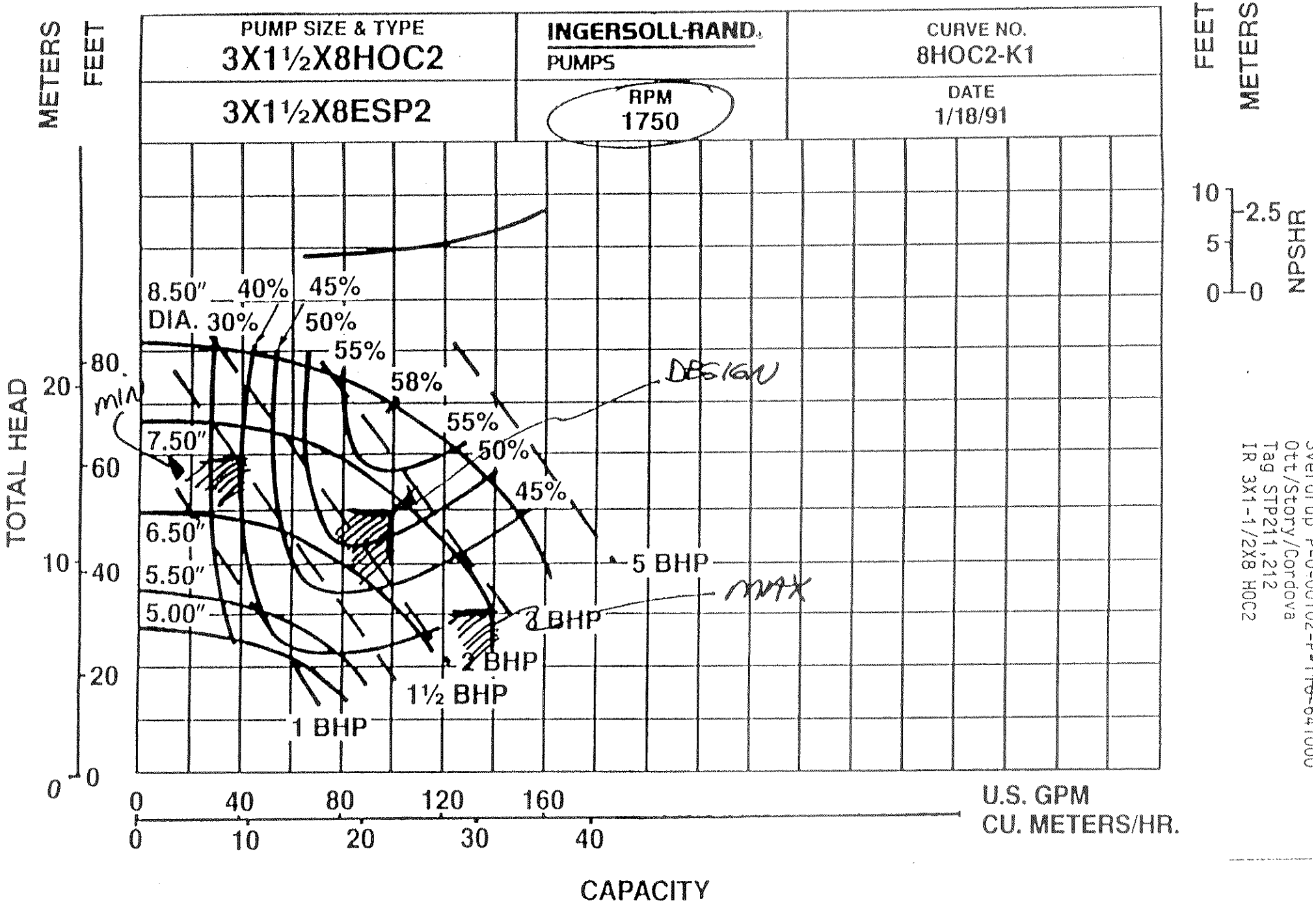
MAX. ALLOWABLE HP = 60



GOULDS SERIAL #772D302-1-2
CUST: SVERDRUP ENVIRONMENTAL, INC.
P.O. #00102-P-111-641000
ITEM #DP-540 & DP-541
SERVICE: WATER PUMPS

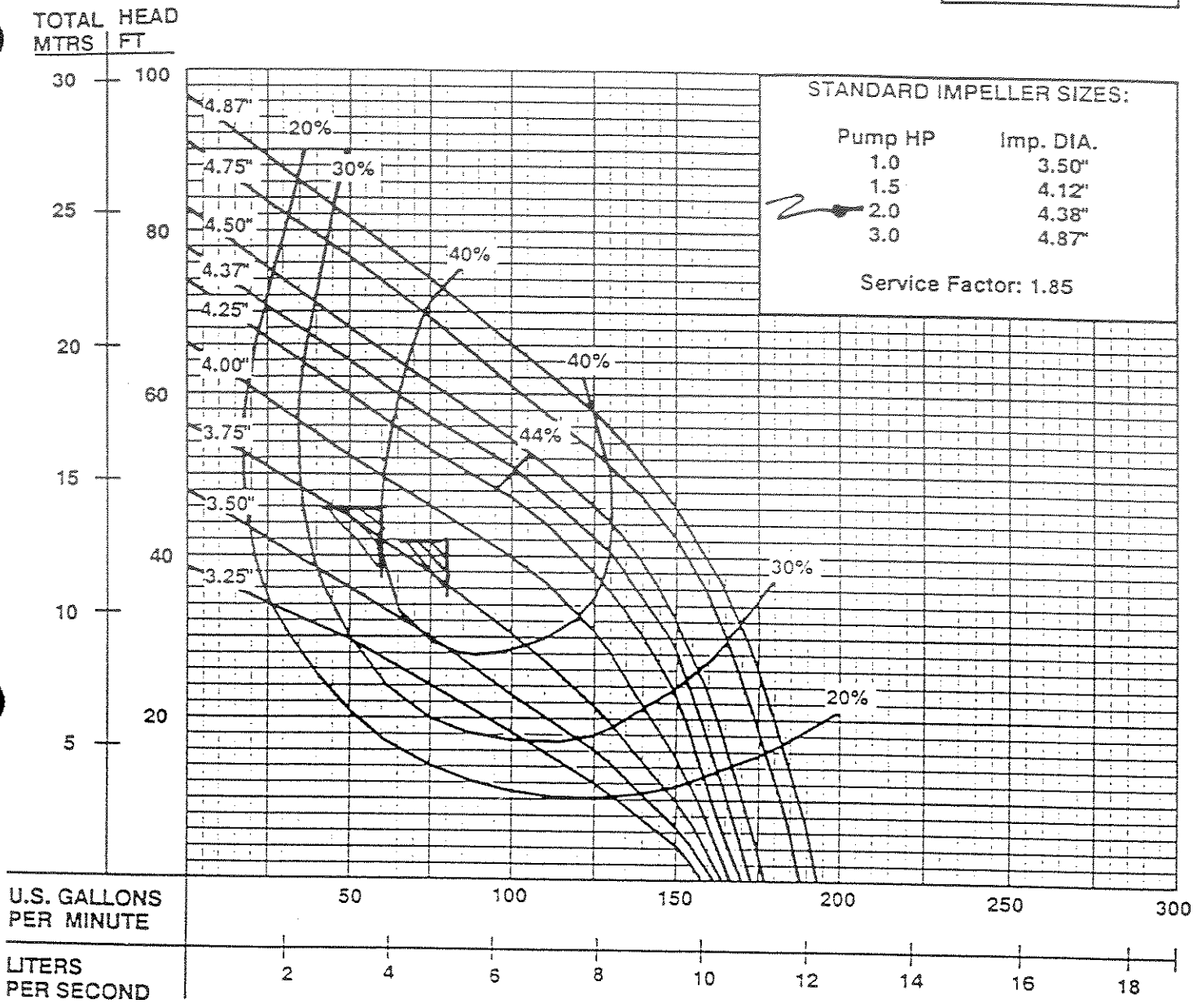
Sludge Transfer Pu
STP – 211 & 212

SECTION 11310 PARAGRAPH 9.1.2



PERFORMANCE CURVE
Series: 3SE-DS, 1.0,Thru 3.0HP, 3450RPM

SECTION	1A
PAGE	65
DATE	7/93
REPLACES	



GTB Sump Pumps
SP – 130A & 130B

Testing is performed with water, specific gravity of 1.0 @ 68° F, other fluids may vary performance.

BARNES PUMPS, INC.
A Burks Pumps, Inc. Company
Distributor Sales & Service Dept.
420 Third Street/P.O. Box 503
Piqua, Ohio 45356-0603
Ph: (513) 773-2442
Fax: (513) 773-2238

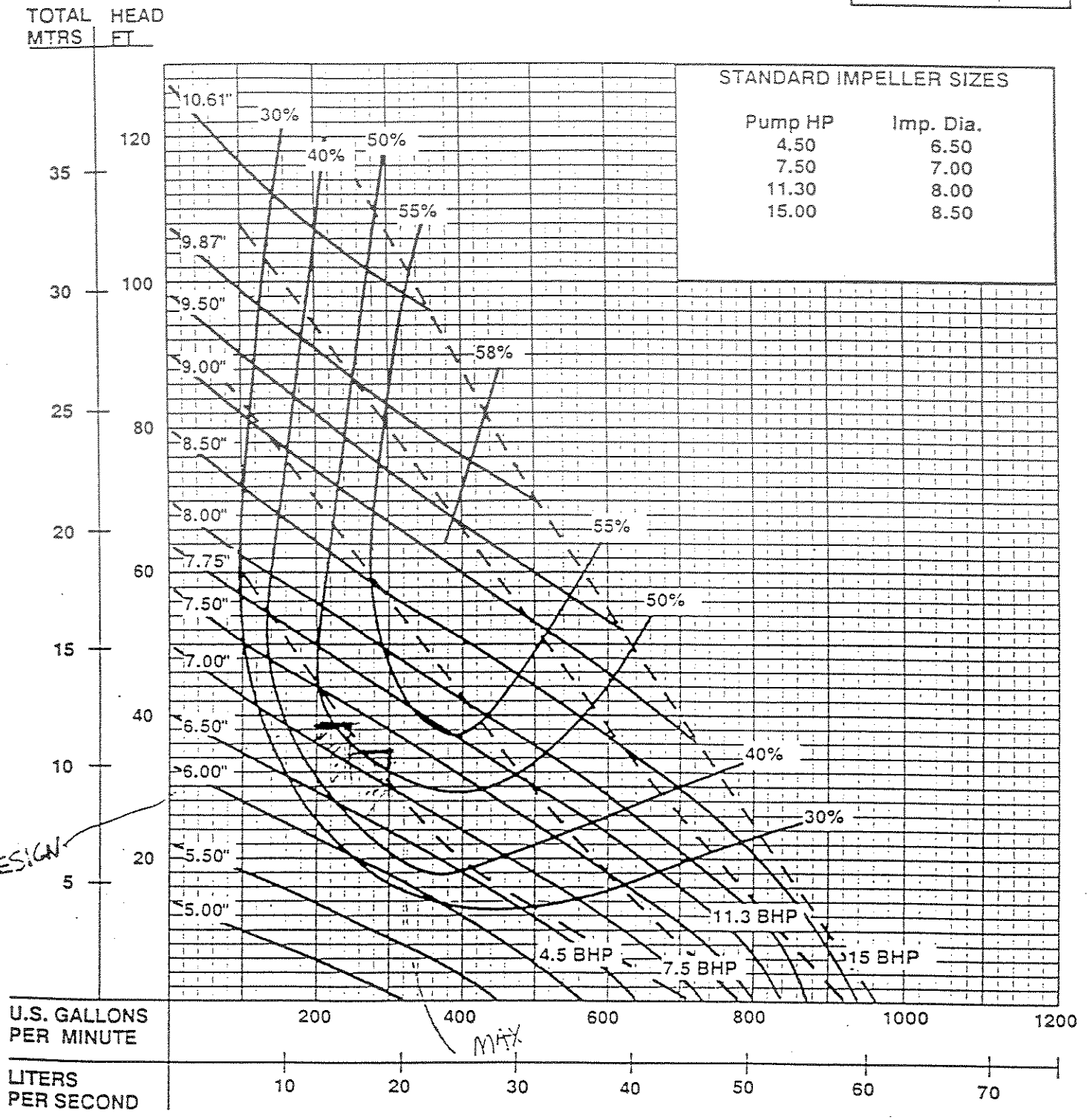
Special Bids & Project Sales
1485 Lexington Ave.
Mansfield, Ohio 44907-2674
Ph: (419) 774-1511
Fax: (419) 774-1530

Submersible Wastewater Pumps Association SWPA MEMBER

MADE IN THE U.S.A.

PERFORMANCE CURVE
Series: 4SE, 4.5, 7.5, 11.3, 15HP, 1750RPM

SECTION	1D
PAGE	39
DATE	7/93
REPLACES	7/92



Testing is performed with water, specific gravity of 1.0 @ 68° F, other fluids may vary performance.

BARNES PUMPS, INC.
A Burks Pumps, Inc. Company
Distributor Sales & Service Dept.
420 Third Street/P.O. Box 603
Piqua, Ohio 45356-0603
Ph: (513) 773-2442
Fax: (513) 773-2238

Special Bids & Project Sales
1485 Lexington Ave.
Mansfield, Ohio 44907-2574
Ph: (419) 774-1511
Fax: (419) 774-1530

STP Sump Pumps
SP – 131A & 131B

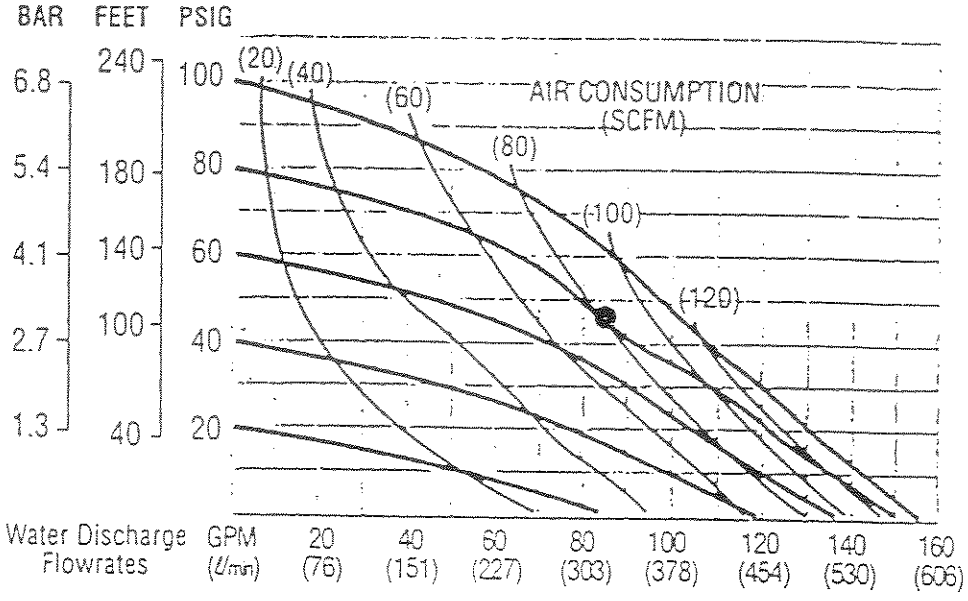
Carbon Feed Pumps

SPECIFICATIONS AND PERFORMANCE

WILDEN MODEL M8 METAL (Rubber/TPE-Fitted) PUMP PERFORMANCE CURVE

Height	26¾"
Width	17"
Depth	13¾"
Ship Weight	Aluminum 67 lbs.
	Cast Iron 112 lbs.
	Stainless Steel 102 lbs.
	Hastelloy 112 lbs.
Air Inlet	½" Female NPT
Inlet	2" NPT*
Outlet	2" NPT*
Suction Lift	Rubber 20' Dry
	25' Wet
	TPE 13' Dry
	25' Wet
Max. Size Solids	¼" Dia.

Example: To pump 85 gpm against a discharge pressure of 45 psig requires 80 psig and 80 scfm air consumption. (See dot on chart.)



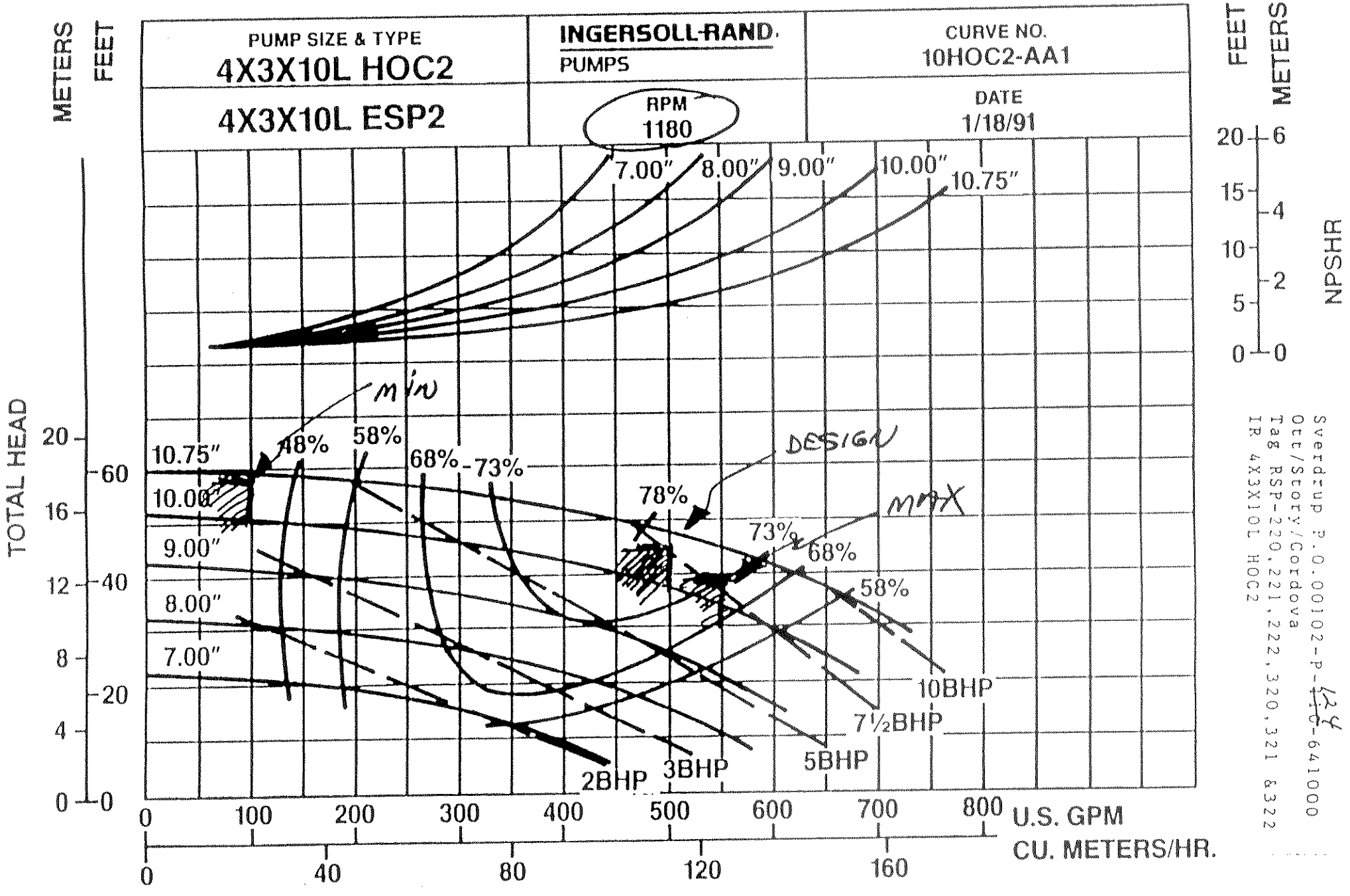
Volumes indicated on chart were determined by actually pumping water in calibrated tanks.

*BSP threads available.

Carbon Feed Pumps
CFP-670 & 671

SECTION 11310 PARAGRAPH 9.1.1

Return Sludge Pumps
RSP-220 - 322



Sverdrup P.O.00102-P-~~110~~ 124-641000
Ott/Story/Cordova
Tag RSP-220,221,222,320,321 &322
IR 4X3X10L HOC2

ITT [redacted]-C Pump FP-680

A unit of ITT Corporation

DTP-F3

5608-0231

IMPELLER DWG.	IMPELLER DIA.	SPECIFIC GRAVITY	VISCOSITY
52-126-946-004	12.500 in.	1.000	32.0 SSU

S.O. 95252 CURVE NO. B116061-97-05-1E1

SIZE 8X6X12F TYPE 8100

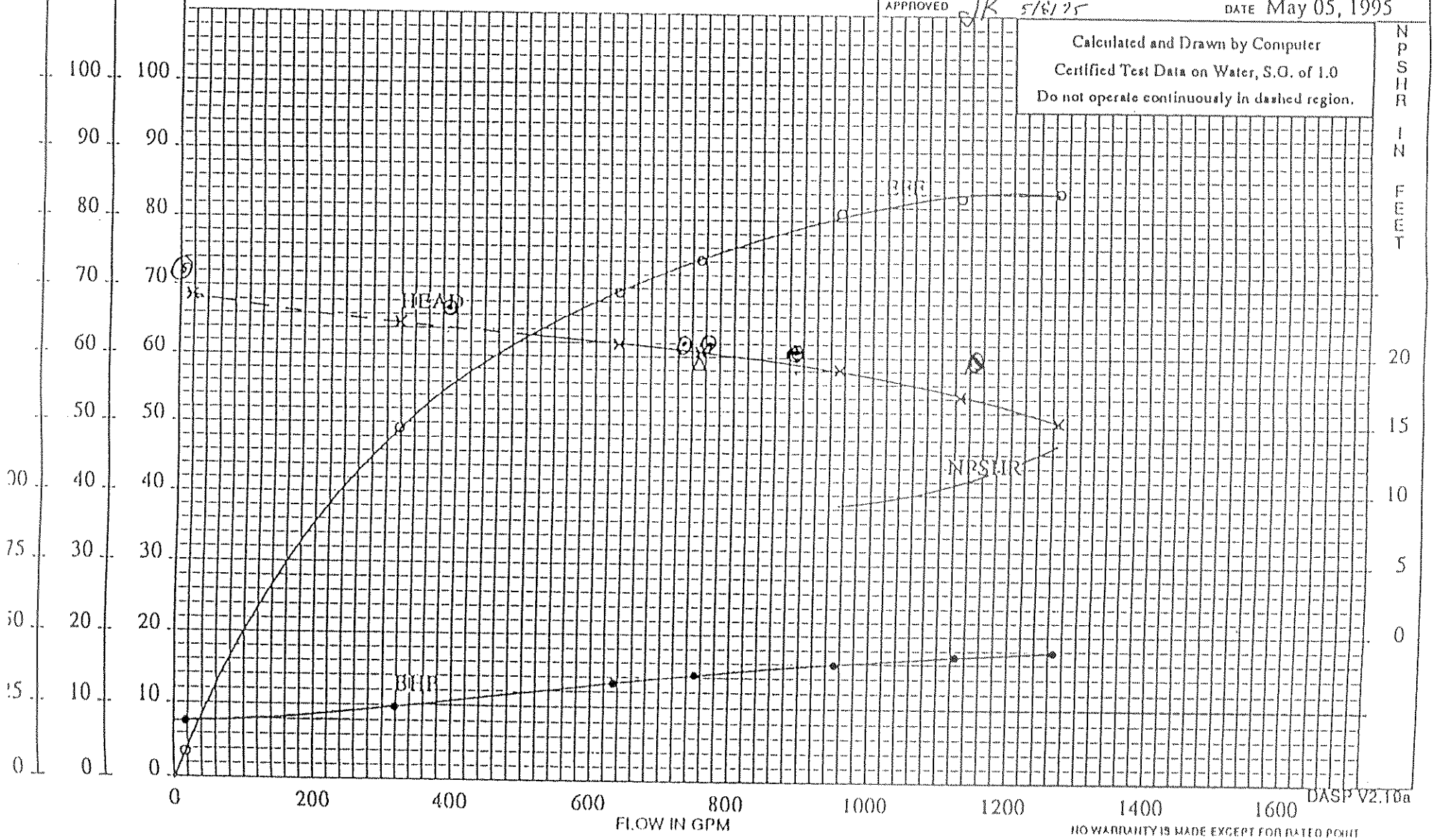
750 GPM 60 PSI 1765 R.P.M.

CUSTOMER SVERDRUP ENVIRONMENTAL

SERIAL NUMBER 3-125-116-061-97-05

APPROVED JK 5/8/95 DATE May 05, 1995

Fire Water Pump
FP-680



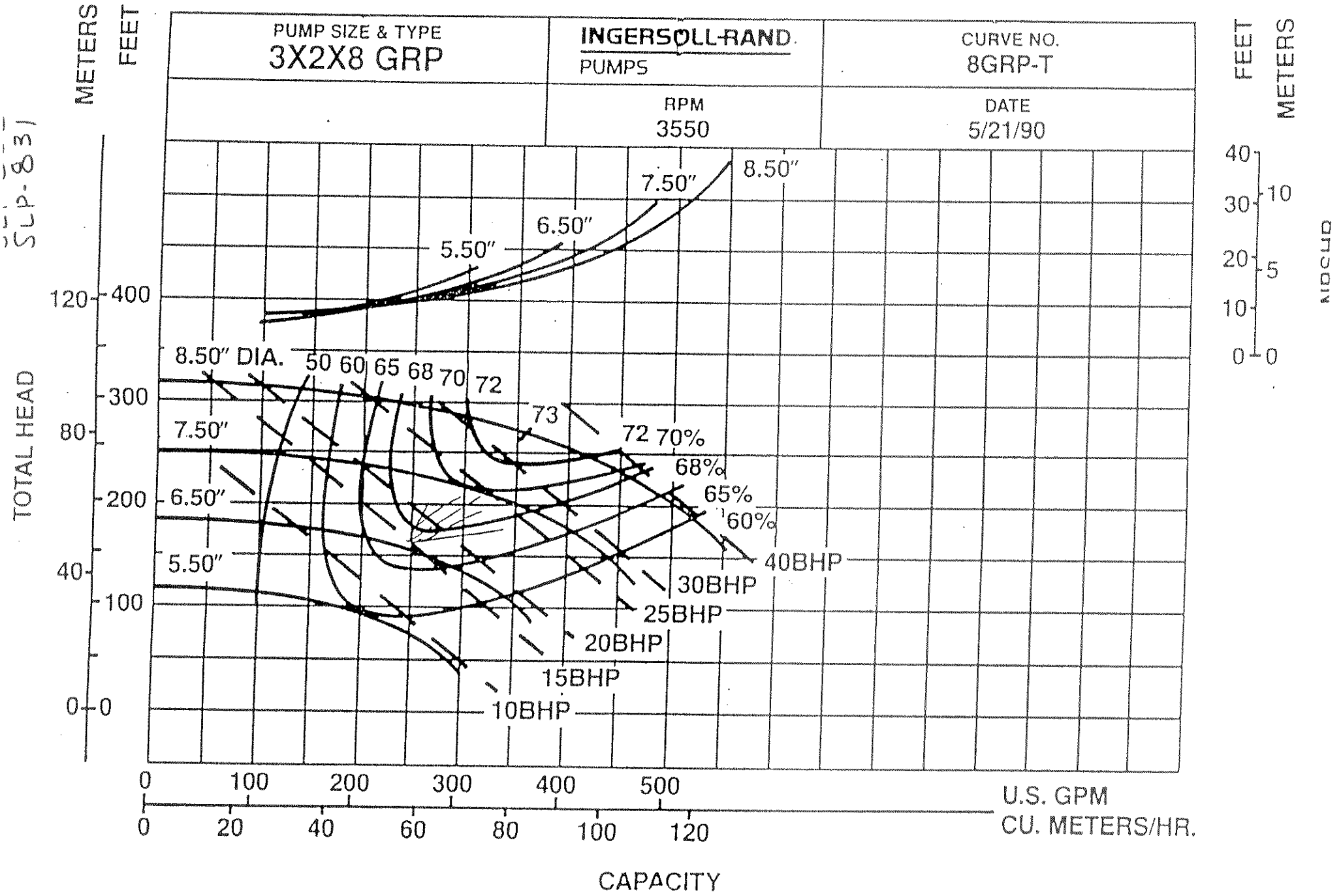
DASP V2.10a

NO WARRANTY IS MADE EXCEPT FOR RATED POINT

250gpm @ 135

TOU Recycle Pumps
SLP – 930 & 931

SLP-931



APPENDIX F

OTT/STORY/CORDOVA GROUNDWATER TREATMENT FACILITY
MASTER EQUIPMENT LIST

Equipment Report (Full List)

Equipment No.	-		
Equipment Type		Person Responsible	
Serial No.		Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AC-901	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		Yes
[illegible]21	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	1ST-AID	FIRST AID STATION/KITS	
Equipment Type		Person Responsible	
Serial No.		Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	ABS-01	SEWAGE PUMP STATION/PUMP-1	
Equipment Type		Person Responsible	
Serial No.		Location	ON SITE GROUNDS
Model No.	PIRANHA 3 DEX	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ABS	General Ledger No.	
Vendor ID	KII	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Equipment Report (Full List)

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TABS-00	SEWAGE PUMPING STATION/ PUMPS 01,02	PM		Yes		No

Safety Note

REFER TO FOLE ABS-01: EVERY 6TH MONTH/Make a visual inspection of the sewage vault. The seal oil in the oil chamber should be checked or when the seal alarm signal is given. It the pump is pulled, check the impeller.
Also check the float levels, to make sure the second stand-by pumps comes on, and a high level is given.

Nameplate Information

Equipment No.	ABS-02	SEWAGE PUMP STATION/PUMP 02	
Equipment Type		Person Responsible	
Serial No.		Location	ON SITE GROUNDS
Model No.	PIRANHA 3	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ABS	General Ledger No.	
Vendor ID	KII	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TABS-00	SEWAGE PUMPING STATION/ PUMPS 01,02	PM		Yes		No

Safety Note

EFER TO FOLE ABS-01: Yearly/Make a visual inspection of the sewage vault. The seal oil in the oil chamber should be checked or when the seal alarm signal is given. It the pump is pulled, check the impeller.
Also check the float levels, to make sure the second stand-by pumps comes on, and a high level is given.

Nameplate Information

Equipment No.	AC-751	GARDNER DENVER/AIR COMPRESSOR-AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.	Y4L025	Location	SLUDGE TREATMENT BUILDING
Model No.	APORKA-CDCDJA	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	GD	General Ledger No.
Vendor ID	CTI	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
		User-defined Field 10

Spare-parts Code

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AC-751	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	AC-752	GARDNER DENVER/AIR COMPRESSOR-AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.	Y4L025	Location	SLUDGE TREATMENT BUILDING
Model No.	APORKA-CDCBJA	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	GD	General Ledger No.
Vendor ID	CTI	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
		User-defined Field 10

Spare-parts Code

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
[illegible]751	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	AC-901-1	INGERSOLL/AIR COMPRESSOR-AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.	30T772848	Location	GROUND TREATMENT BUILDING
Model No.	2-3000AZ0	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	CTI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code	900 SIRS	User-defined Field 10	

Item No.	Description	Qty	Site
26C28	OIL FILTER FOR GARDNER DENVER		
AEON 500	AEON 500 OIL FOR DENVER COMPRESSOR		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AC-901	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		Yes

Safety Note

MOTOR/ MODEL NUM. CAT#M23374T SER. NO. 1194C

Nameplate Information

Equipment Report (Full List)

Equipment No.	AC-901-2	INGERSOLL/AIR COMPRESSOR-AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.	30T772846	Location	GROUND TREATMENT BUILDING
Model No.	2-3000AZ	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	CTI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

-

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AC-901	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		Yes

Safety Note

MOTOR/MODEL NO.CAT#M2334T SER. NO. 1194C

Nameplate Information

Equipment No.	AC-902-1	INGERSOLL/AIR COMPRESSOR AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.	2-3000AZ0	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	CTI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AC-901	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		Yes

Safety Note

MOTOR MODEL NO. CAT#M2334T SER. NO. 1194C
This blower has been moved into the blower bld. to keep noise levels down in the GTB. Blower 901 is stilled located in the GTB only as a back- up of 902.

Nameplate Information

Equipment No.	AC-902-2	INGERSOLL/AIR COMPRESSOR AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.	2-300AZ	Location	BLOWER BUILDING
Model No.	30T772847	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	CTI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AC-901	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		Yes

Safety Note

MOTOR MODEL NO. CAT#M2334T SER. NO. 1194C
This blower has been moved into the blower bld. to keep noise levels down in the GTB. Blower 901 is stilled located in the GTB only as a back- up of 902.

Nameplate Information

Equipment Report (Full List)

Equipment No.	AC-903-1	INGERSOLL/AIR COMPRESSOR AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.	30T772850	Location	BLOWER BUILDING
Model No.	2-3000AZO	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	CTI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AC-901	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		Yes

Safety Note

MOTOR MODEL NO. CAT#M2334T SER. NO. 1194C

Nameplate Information

Equipment No.	AC-903-2	INGERSOLL/AIRCOMPRESSOR AND MOTOR	
Equipment Type	AC	Person Responsible	
Serial No.	30T772850	Location	BLOWER BUILDING
Model No.	2-3000AZO	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	CTI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
[illegible]-901	DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER	PM		Yes		Yes

Safety Note

MOTOR MODEL NO. CAT#M2334T SER. NO. 30T772850

Nameplate Information

Equipment No.	ADS-000	Air Distrubation Screens	
Equipment Type		Person Responsible	
Serial No.		Location	ALL BUILDINGS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
ADS-000	Air Distribution Screens			Yes		No

Safety Note

Air Distrubartion Screens need to be checked and cleaned.

Nameplate Information

Equipment No.	AHU-981	AIR HANDLING UNIT AND MOTOR-OFFICE	
Equipment Type	AHU	Person Responsible	
Serial No.	35G00345-06	Location	GROUND TREATMENT BUILDING
Model No.	LSL130CV	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AUH-981	GREASE UNIT, CHANGE AIR FILTER, AND CHECK DRIVE BELT	PM		Yes		Yes

Safety Note

THIS UNIT FEEDS THE OFFICE AREA. MOTOR PART NO. 10-349937-03 AND SER. NO. BNG-08 AND A 1.5 H.P. THIS UNIT HAS 2 GREASE ZERTS, AND AIR FILTERS SIZE 20X16X2 DRIVE BELT IS P51-038-A38 THE HEATER UNIT IS MODEL NO. F-95-01483

Nameplate Information

Equipment No.	AHU-982	AIR HANDLING UNIT AND MOTOR-LAB	
Equipment Type	AHU	Person Responsible	
Serial No.	35F01629-06	Location	GROUND TREATMENT BUILDING
Model No.	LSL106CV	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
AUH-981	GREASE UNIT, CHANGE AIR FILTER, AND CHECK DRIVE BELT	PM		Yes		Yes

Safety Note

THIS UNIT FEEDS THE LAB AREA. MOTOR PART NO. 10-349937-03 AND SER. NO. BNG-08 AND A 1.5 H.P. THIS UNIT HAS 2 GREASE ZERTS, AND AIR FILTERS SIZE 20X16X2 DRIVE BELT IS P51-038-A38 THE HEATER UNIT IS MODEL NO. F-95-01483

Nameplate Information

Equipment No.	ASB-220	ACTIVATED SLUDGE BLOWER AND MOTOR	
Equipment Type	ASB	Person Responsible	
Serial No.	M93-7481	Location	BLOWER BUILDING
Model No.	6CH55MILS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
ASB-220	ACTIVATED SLUDGE BLOWER AND MOTOR	PM		Yes		No

Safety Note

MOTOR SER. NO. 1-5112-05197-01-6

Nameplate Information

Equipment Report (Full List)

Equipment No.	ASB-221	ACTIVATED SLUDGE BLOWER AND MOTOR	
Equipment Type	ASB	Person Responsible	
Serial No.	M93-7482	Location	BLOWER BUILDING
Model No.	6CH55MILS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
ASB-220	ACTIVATED SLUDGE BLOWER AND MOTOR	PM		Yes		No

Safety Note

MOTOR SER. NO. 1-5112-05197-01-6

Nameplate Information

Equipment No.	ASB-222	ACTIVATED SLUDGE BLOWER AND MOTOR	
Equipment Type	ASB	Person Responsible	
Serial No.	M93-7483	Location	BLOWER BUILDING
Model No.	6CH55MILS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
-220	ACTIVATED SLUDGE BLOWER AND MOTOR	PM		Yes		No

Safety Note

MOTOR SER. NO. 1-5112-05197-01-6

Nameplate Information

Equipment No.	AWP-00	ACID WASH PUMP-FOR PRESS PLATES	
Equipment Type	AWP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

REFER TO BOOK FFP-721: (JWI FILTER PRESS)

Nameplate Information

Equipment Report (Full List)

Equipment No.	C-201	CLAIRIFIER INSIDE PCT 201	
Equipment Type	C	Person Responsible	
Serial No.		Location	PCT-201
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	S&L	General Ledger No.
Vendor ID	S&L	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
C-201	CLARIFIER UNITS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	C-202	CLAIRIFIER INSIDE PCT 202	
Equipment Type	C	Person Responsible	
Serial No.		Location	PCT-202
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	S&L	General Ledger No.
Vendor ID	S&L	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Equipment Report (Full List)

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
C-201	CLARIFIER UNITS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	C-301	CLARIFIER OUTSIDE (301)	
Equipment Type	C	Person Responsible	
Serial No.		Location	OUTSIDE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	S&L	General Ledger No.	
Vendor ID	S&L	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code	C301	User-defined Field 10	

Item No.	Description	Qty	Site
01	SHEAR PINS FOR C-301 AND 302 OUTSIDE CLAIFIRES		
02	PARKER CYLINDER KIT FOR 301 AND 302 OUTSIDE CLAIF		
03	FAIRFIELD SEAL FOR 301 & 302 OUTSIDE CLAIFIERS		
04	FAIRFIELD O RING FOR 301 & 302		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
C-201	CLARIFIER UNITS	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	C-302	CLARIFIER OUTSIDE (302)	
Equipment Type	C	Person Responsible	
Serial No.		Location	OUTSIDE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	S&L	General Ledger No.
Vendor ID	S&L	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code	C302	User-defined Field 10

Item No	Description	Qty	Site
01	SHEAR PINS FOR C-301 AND 302 OUTSIDE CLAIFIRES		
02	PARKER CYLINDER KIT FOR 301 AND 302 OUTSIDE CLAIF		
03	FAIRFIELD SEAL FOR 301 & 302 OUTSIDE CLAIFIERS		
04	FAIRFIELD O RING FOR 301 & 302		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
C-201	CLARIFIER UNITS	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	CLARKLIFT	FORKLIFT MAINTENANCE	
Equipment Type		Person Responsible	
Serial No.	P365L-0217-94J7	Location	SLUDGE TREATMENT BUILDING
Model No.	CGP 25	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	CLARKLIFT	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CLARKLIFT-0	CLARKLIFT TO PERFORM MAINTENANCE ON FORKLIFT	PM		Yes		No

Note

Nameplate Information

Equipment No.	CMP-851	CAUSTIC FEED PUMP IN TOU BUILDING	
Equipment Type	CMP	Person Responsible	
Serial No.		Location	THERMAL OXIDATION BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	W&T	General Ledger No.	
Vendor ID	W&T	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CMP-851	CAUSTIC FEED PUMP-TOU	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	CS-665	CARBON SILO	
Equipment Type	CS	Person Responsible	
Serial No.		Location	CARBON SILO
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	CMS	General Ledger No.	
Vendor ID	CMS	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code	CS-0	User-defined Field 10	

Item No.	Description	Qty	Site
00000	DUST COLLECTOR FILTER BAGS		
05	ONE SET ROTOR BALDS FOR CARBON		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CS-665	CARBON SILO	PM	3.00	Yes		Yes

Safety Note

AIR HEATER/MOD. NO. 16-480360-10.0-24T
GATE VALVE/PART NO. 921782
ELECTRIC MOTOR/
FEEDER MOTOR/TS6H1460AA-2R
SILO VIBRATOR/MOD. V86CIXP/SER. 756773
EXHAUST FAN
BOWL AND UNJECTOR
MIXING TANK
WALDEN PUMPS 1 & 2
WATER FLUSH PUMP

Nameplate Information

Equipment No.	CST-663	CARBON SLURRY TANK	
Equipment Type		Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
65	CARBON SILO	PM	3.00	Yes		Yes

Safety Note

This unit has a motor driven mixer, that needs to be greased every 6th months, and a gear box that the oil level needs checked for levels. The in-side of the tank should be hosed down to free the carbon off the walls.

Nameplate Information

Equipment Report (Full List)

Equipment No.	CST-666	CARBON SILO FEEDER	
Equipment Type		Person Responsible	
Serial No.		Location	CARBON SILO
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code	CS-0	User-defined Field 10	

Item No	Description	Qty	Site
00000	DUST COLLECTOR FILTER BAGS		
05	ONE SET ROTOR BALDS FOR CARBON		

Component Equipment No /Description

Task No	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CS-665	CARBON SILO	PM	3.00	Yes		Yes

Safety Note

The carbon feeder is pre-set to feed the right amount of carbon into the treatment system. This unit should be checked and the mixing bowl as well for carbon build ups. The water feed into the mixing bowl is set to feed the at max. water pressure to keep the carbon mix in the mixing bowl.

Nameplate Information

Equipment No.	CST-670	CARBON FEED PUMP/WILDEN,M8 EAST	
Equipment Type		Person Responsible	
Serial No.	00635789	Location	GROUND TREATMENT BUILDING
Model No.	M-8	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	WILDEN'S	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CS-665	CARBON SILO	PM	3.00	Yes		Yes

Safety Note

This unit is used to pump carbon into the PCT-201. This pump is set to feed at a slow rate to keep a operational level in the slurry tank.

Nameplate Information

Equipment No.	CST-671	CARBON FEED PUMP/WILDEN, M8 WEST	
Equipment Type		Person Responsible	
Serial No.	00579802	Location	GROUND TREATMENT BUILDING
Model No.	M-8	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	WILDEN'S	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Equipment Report (Full List)

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CS-665	CARBON SILO	PM	3.00	Yes		Yes

Safety Note

This unit is used to pump carbon into the PCT-201. This pump is set to feed at a slow rate to keep a operational level in the slurry tank.

Nameplate Information

Equipment No.	DB-120	DIFFUSED AIR BLOWERS	
Equipment Type	DAS	Person Responsible	
Serial No.	M93-7478	Location	BLOWER BUILDING
Model No.	CH55M1LS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.
Vendor ID	I R	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DB-120	DIFFUSED AIR BLOWERS	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	DB-121	DIFFUSED AIR BLOWERS	
Equipment Type	DAS	Person Responsible	
Serial No.	M93-7479	Location	BLOWER BUILDING
Model No.	CH55M1LS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DB-120	DIFFUSED AIR BLOWERS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	DB-122	DIFFUSED AIR BLOWERS	
Equipment Type	DAS	Person Responsible	
Serial No.	M93-7480	Location	BLOWER BUILDING
Model No.	CH55M1LS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Equipment Report (Full List)

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DB-120	DIFFUSED AIR BLOWERS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	DF-130	BY PASS FANS	
Equipment Type	DF	Person Responsible	
Serial No.		Location	OUTSIDE
Model No.	#17 FRP-MW	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DF-130	BY PASS FANS	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	DF-131	BY PASS FANS	
Equipment Type	DF	Person Responsible	
Serial No.		Location	OUTSIDE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DF-130	BY PASS FANS	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	DF-132	BY PASS FANS	
Equipment Type	DF	Person Responsible	
Serial No.		Location	OUTSIDE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DF-130	BY PASS FANS	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	DP-540	DISCHARGE PUMP (EFFLUENT)	
Equipment Type	DP	Person Responsible	
Serial No.	772D302.2	Location	GROUND TREATMENT BUILDING
Model No.	3196	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	G/PUMPS	General Ledger No.
Vendor ID	G/PUMPS	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DP-540	DISCHARGE PUMP (EFFLUENT)	PM		Yes		No

Safety Note

MOTOR/5K324BS205D20 SER. NO. VK6344216
VALVE/SER. NO.FOO 3998/-60967-02

Nameplate Information

Equipment Report (Full List)

Equipment No.	DP-541	DISCHARGE PUMP (EFFLUENT)	
Equipment Type	DP	Person Responsible	
Serial No.	772D302.1	Location	GROUND TREATMENT BUILDING
Model No.	3196	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	G/PUMPS	General Ledger No.	
Vendor ID	G/PUMPS	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DP-540	DISCHARGE PUMP (EFFLUENT)	PM		Yes		No

Safety Note

MOTOR/ MODEL NO. 5K324BS205D20 SER. NO.VK6344216
VALVE /SER. NO. FOO 3999-690967-02

Nameplate Information

Equipment No.	DRUM PUMP-1	CHEMICAL DRUM PUMP	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
DRUM PUMP-1	CHEMICAL DRUM PUMP			Yes		No

Safety Note

This pump is used to pump chemicals from 55gal. drums, this is done by inserting the shaft into the drum. Safty percaution must be taken when pumping, for this pump puts out a large volume of chemical at one time. Safty glasses, face sheild, boots, and tyvke must be worn whem pumping chemicals.

Nameplate Information

Equipment No.	EF-951	EXHAUST FAN-NORTH EAST WALL	
Equipment Type	EF	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

MOTOR IS BY G.E. CAN'T NOT READ NUMBERS TEMP. CONTROLER IS LOCATED NEXT TO FAN. SET AT 85F.

Nameplate Information

Equipment No.	EF-952 A-B	EXHAUST FAN - CENTER ROOM - N.W. WALL	
Equipment Type	EF	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

OTOR IS BY G.E. UNABLE TO READ OTHER NUMBERS 952A- TEMP CONTROLER IS LOCATED ON CENTER COLUMB NEXT POLYMER FEED PUMP. 952B- TMEP. CONTROLER IS LOCATED ON CENTER COLUMB AT THE END NEAR THE SHOP.

Nameplate Information

Equipment No.	EF-953-A	EXHAUST FAN ON NORTH EAST MEZZ	
Equipment Type	EF	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	EF-953-B	EXHAUST FAN ON WEST MEZZ	
Equipment Type	EF	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

MOTOR IS BY G.E. TEMP. CONTROL IS LOCATED BY LUNCH ROOM DOOR. TEMP. SETTING IS AT 80 F.

Nameplate Information

Equipment No.	EF-955	EXHAUST AIR FAN E. MEZZANINE ELETC. ROOM	
Equipment Type	DF	Person Responsible	
Serial No.	1440851	Location	GROUND TREATMENT BUILDING
Model No.	TCDF	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	H&H	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

[illegible]S 2 GREASE ZERTS THIS UNIT EXHAUSTES AIR FROM THE ELETRICAL ROOM TO THE OUTSIDE. THE TEMP. CONTROL [illegible]LOCATED IN THE ELETRICAL ROOM NEXT TO THE CONTROL CABINET 3. THIS UNIT ALONG WITH 956 BOTH COME ON [illegible]OGETHER.

Nameplate Information

Equipment No.	EF-956	FRESH AIR FEED TO ELETRICAL ROOM E. MEZZ	
Equipment Type	EF	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
[illegible]-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

THIS UNIT HAS TWO GREASE ZERTS TO GREASE. THE TEMP. CONTROL IS LOCATED IN THE ELETRICAL ROOM NEXT TO CONTROL CABNIT 3. THIS UNIT COMES ON WHEN 955 COMES ON.

Nameplate Information

Equipment No.	EF-957-A	EXHAUST FAN IN BLOWER BLD. NORTH WEST	
Equipment Type	EF	Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	EF-957-B	EXHAUST FAN IN BLOWER BLD. SOUTH WEST	
Equipment Type	EF	Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	EF-958	EXHAUST FAN-PUMPING BLD.	
Equipment Type	EF	Person Responsible	
Serial No.		Location	SLUDGE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	EF-959	EXHAUST FAN - LAB HOOD	
Equipment Type	DF	Person Responsible	
Serial No.	94956-PI-RI	Location	GROUND TREATMENT BUILDING
Model No.	VA-2012	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	BMS	General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

MOTOR: 1HP/ 3450 RPM/HAS TWO GREASE ZERTS

Nameplate Information

Equipment No.	EF-980	EXHAUST FAN TO REST-ROOM	
Equipment Type	DF	Person Responsible	
Serial No.	W-1-95	Location	GROUND TREATMENT BUILDING
Model No.	M3108	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	BALDOR	General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

N/CAT#B303 MODEL NO. VIBK08L7AINL20SK
TOR/ MODEL NO. 2QC48517D2055H

Nameplate Information

Equipment No.	EF-981-A	EXHAUST FAN FOR T.O.U. BUILDING	
Equipment Type		Person Responsible	
Serial No.		Location	THERMAL OXIDATION BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
parts Code		User-defined Field 10	

Component Equipment No./Description

Task No	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

THIS UNIT WAS RE-LOCATED FROM THE CONTROL ROOM TO THE NEW TOU BUILDING. (SCRUBBER AREA) THIS UNIT IS LOCATED ON THE EAST WALL, ABOUT 15 FT FROM THE FLOOR

Nameplate Information

Equipment No.	EF-981-B	EXHAUST FAN/TOU CONTROL ROOM	
Equipment Type		Person Responsible	
Serial No.		Location	THERMAL OXIDATION BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EF-951	EXHAUST FANS FOR BUILDINGS	PM		Yes		Yes

Safety Note

THIS UNIT WAS INSTALLED WHEN THE OLD UNIT WAS MOVED TO THE SCRUBBER ROOM AREA. THIS UNIT IS LOCATED IN THE CONTROL ROOM ON THE EAST WALL.

Nameplate Information

Equipment Report (Full List)

Equipment No.	EL-000	EMERGENCY LIGHTING	
Equipment Type	EL	Person Responsible	
Serial No.		Location	IN ALL BUILDINGS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EL-000	EMERGENCY LIGHTING	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	EL-001	EMERGENCY LIGHTING	
Equipment Type	EL	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	BLOWER BUILDING
Priority		Sub-location 2	SLUDGE TREATMENT BUILDING
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EL-000	EMERGENCY LIGHTING	PM		Yes		No

Safety Note

EMERGENCY LIGHTING LOCATION: CONTROL ROOM: NE CORNER & SW CORNER / HALLWAY: SOUTH ONE /SUPERINTENDENT OFFICE: NE CORNER & SW CORNER / LAB: NE CORNER & NW CORNER & SE CORNER & SE CORNER / ELETRICAL ROOM CONTAINS 4 FLOURESCENTS / BLOWER BLD. HAS 5 FLOURESCENTS AND 2 REG. / SLUDGE BLD: HAS 4 FLOURESCENTS AND 5 REG.

Nameplate Information

Equipment No.	ELETC. SWITCH CABINET	CHANGE AIR FILTERS 20 X 20 X 1	
Equipment Type		Person Responsible	
Serial No.		Location	ELETRICAL ROOM
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
ELETC. SWITCH	CHANGE OUT FILTERS WITH 20 X20 X 1	PM	3.00	Yes		No

Safety Note

WHEN CHANGING OUT THE FILTERS, BE SURE TO WEAR GLOVES AND EYE PROTECTION. WHEN CHANGING OUT FILTERS IN THE BLOWER BLD. HEARING PROTECTION MUST BE USED.

Nameplate Information

Equipment Report (Full List)

Equipment No.	ESH-000	ELETRICAL SWITCH HOUSE	
Equipment Type	ESH	Person Responsible	
Serial No.		Location	ON SITE GROUNDS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
ESH-000	ELETRICAL SWITCH HOUSE- CLEAN FLOORS	CLEAN	3.00	Yes		No

Note

Nameplate Information

Equipment No.	ET-983	FRESH AIR INTAKE INTO LAB	
Equipment Type	AHU	Person Responsible	
Serial No.	95-111188-11	Location	GROUND TREATMENT BUILDING
Model No.	SF-960	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	TWIN	General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$21,229.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
ET-983	FRESH AIR INTAKE INTO LAB	PM		Yes		No

Safety Note

THIS UNIT HAS 2 GREASE ZERTS ON MOTOR, ALSO AIR FILTER TO CHANGE.

Nameplate Information

Equipment No.	EW-1	EXTRACTION WELL 1	
Equipment Type	EW	Person Responsible	
Serial No.		Location	TOP OF CREEK BED
Model No.	135575-4	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-1-4	AMP READINGS ON THE THREE LEAD WIRES TO MOTOR	PM		Yes		Yes

Safety Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 6-15-95 AT A DEPTH OF 85.5' AND A WATER LEVEL OF 617.4 THIS WELL HAS A GRUNDFOS PUMP MODEL 135575-4 AND A CAPACITY OF 100 GPM. THE MOTOR IS 7.5 HP 480 VOLTS, 3 PHASE.

Nameplate Information

Equipment Report (Full List)

Equipment No.	EW-2	EXTRACTION WELL 2	
Equipment Type	EW	Person Responsible	
Serial No.	99C19-30-0108	Location	TOP OF CREEK BED
Model No.	A-12B60009-9925	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	GP	General Ledger No.	
Vendor ID	GAGE	Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-1-4	AMP READINGS ON THE THREE LEAD WIRES TO MOTOR	PM		Yes		Yes
EW-2	EXTRACTION WELL 2	PM		Yes		No

Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 6-20-95 AT A DEPTH OF 86.5' AND A WATER LEVEL OF 615.9
THIS WELL HAS A GRUNDFOS PUMP MODEL 135575-4 AND A CAPACITY OF 100 GPM. THE MOTOR IS 7.5 HP 480 VOLTS, 3 PHASE.

On Aug. 12th 1999, a new motor and pump was installed into this well, by the Sverdrup Group. This pump is a 10 Hp. The Type is 858100-9, and the Model No. is
A-12B60009-9925. On this pump the check valve was removed, to making pulling of this pump easy.

Nameplate Information

Equipment Report (Full List)

Equipment No.	EW-3	EXTRACTION WELL 3	
Equipment Type	EW	Person Responsible	
Serial No.	99C19-30-0098	Location	TOP OF CREEK BED
Model No.	A-12B60009-9925	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	GP	General Ledger No.	
Vendor ID	GAGE	Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-1-4	AMP READINGS ON THE THREE LEAD WIRES TO MOTOR	PM		Yes		Yes
EW-3	EXTRACTION WELL 3	PM		Yes		No

Safety Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 7-19-95 AT A DEPTH OF 95' AND A WATER LEVEL OF 612.4.
THIS WELL HAS A GRUNDFOS PUMP MODEL 135575-4 AND A CAPACITY OF 100 GPM. THE MOTOR IS 7.5 HP 480 VOLTS, 3 PHASE.

On Aug. 6th 1999, a new motor and pump was installed into this well, by the Sverdrup Group. This pump is a 10 Hp. The Type is 858100-9, and the Model No. is
12B60009-9925. On this pump the check valve was removed, to making pulling of this pump easy.

Nameplate Information

Equipment Report (Full List)

Equipment No.	EW-4	EXTRACTION WELL 4	
Equipment Type	EW	Person Responsible	
Serial No.	99C19-30-0088	Location	ON RIVER RD
Model No.	A-12B60009-9925	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	GP	General Ledger No.	
Vendor ID	GAGE	Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-1-4	AMP READINGS ON THE THREE LEAD WIRES TO MOTOR	PM		Yes		Yes
EW-4	EXTRACTION WELL 4	PM		Yes		No

Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 7-5-95 AT A DEPTH OF 99.5' AND A WATER LEVEL OF 613.7

On Aug. 10th 1999, a new motor and pump was installed into this well, by the Sverdrup Group. This pump is a 10 Hp. The Type is 858100-9, and the Model No. is
12B60009-9925. On this pump the check valve was removed, to making pulling of this pump easy.

Nameplate Information

Equipment Report (Full List)

Equipment No.	EW-5	EXTRACTION WELL 5	
Equipment Type	EW	Person Responsible	
Serial No.		Location	ON RIVER RD
Model No.	80550-5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-5	EXTRACTION WELL 5	PM		Yes		No

Safety Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 7-5-95 AT A DEPTH OF 99.5' AND A WATER LEVEL OF 613.7
THIS WELL HAS A GRUNDFOS PUMP MODEL 80550-5, WITH A CAPACITY OF 75 GPM. THE MOTOR IS 5 HP 480 VOLTS, 3 PHASE.

Nameplate Information

Equipment No.	EW-6	EXTRACTION WELL 6	
Equipment Type	EW	Person Responsible	
Serial No.		Location	ON RIVER RD
Model No.	805580-5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-6	EXTRACTION WELL 6	PM		Yes		No

Safety Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 6-23-95 AT A DEPTH OF 85.5' AND A WATER LEVEL OF 619.9
THIS WELL HAS A GRUNDFOS PUMP MODEL 80550-5, WITH A CAPACITY OF 75 GPM. THE MOTOR IS 5 HP 480 VOLTS, 3 PHASE.
A new motor and pump was purshed to install in to EW-6 on Jan. 16th 1998. P.O. 0375929. Item no. 12890005, 5 HP with a 3" discharge. A adaptor is needed to install into a well that has a 2" line.l

Nameplate Information

Equipment No.	EW-7	EXTRACTION WELL 7	
Equipment Type	EW	Person Responsible	
Serial No.		Location	ON RIVER RD
Model No.	80550-5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-7	EXTRACTION WELL 7	PM		Yes		No

Safety Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 7-10 -95 AT A DEPTH OF 90.5' AND A WATER LEVEL OF 623.9 THIS WELL HAS A GRUNDFOS PUMP MODEL 80550-5, WITH A CAPACITY OF 75 GPM. THE MOTOR IS 5 HP 480 VOLTS, 3 PHASE.

Nameplate Information

Equipment No.	EW-8	EXTRACTION WELL 8	
Equipment Type	EW	Person Responsible	
Serial No.		Location	ON SITE GROUNDS
Model No.	135550-3	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-8	EXTRACTION WELL 8	PM		Yes		No

Safety Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 7-2-95 AT A DEPTH OF 75.5' AND A WATER LEVEL OF 637.4
THIS WELL HAS A GRUNDFOS PUMP MODEL 135550-3, AND A CAPACITY OF 135 GPM. THE MOTOR IS A 5 HP 480 VOLTS, 3 PHASE.

Nameplate Information

Equipment No.	EW-9	EXTRACTION WELL 9	
Equipment Type	EW	Person Responsible	
Serial No.		Location	ON SITE GROUNDS
Model No.	40515-5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	EW	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No /Description

No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
EW-9	EXTRACTION WELL 9	PM		Yes		No

Safety Note

THIS WELL WAS INSTALLED BY CDS, INC. ON 8-3-95 AT A DEPTH OF 150' AND A WATER LEVEL OF (ARTESIAN) THIS WELL HAS A GRUNDFOS PUMP MODEL 40515-5 WITHA CAPACTIY OF 40 GPM. THE MOTOR IS 1.5 HP, 480 VOLTS, 3 PHASE.

Nameplate Information

Equipment No.	EXT-15	FIRE EXTINGUISHERS- 15 EA	
Equipment Type		Person Responsible	
Serial No.		Location	IN ALL BUILDINGS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	SAFETY	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No /Description

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	EYE WASH 1-4	EYE WASH /SAFETY SHOWERS	
Equipment Type		Person Responsible	
Serial No.		Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	FCP-000	FERRIC LEAK AT MIXER. CHANGE RAG	
Equipment Type		Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Equipment Report (Full List)

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FCP-000	FERRIC LEAK, AT MIXER. CHANGE RAG			Yes		No

Safety Note

Nameplate Information

Equipment No.	FCP-600	FERRIC CHLORIDE PUMP 1	
Equipment Type	FCP	Person Responsible	
Serial No.	BA16017	Location	GROUND TREATMENT BUILDING
Model No.	44-213-MIP	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	W&T	General Ledger No.	
Vendor ID	W&T	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FCP-600	FERRIC CHLORIDE PUMP - 1	PM		Yes		No

Safety Note

MOTOR IS A G.E. 1/4HP MODEL NO. 5KC32GN13J 1725RPM
PALUSATION DAMPNER IS MOD. 87003-30 SER. NO.98303B

Nameplate Information

Equipment No.	FCP-601	FERRIC CHLORIDE PUMP 2	
Equipment Type	FCP	Person Responsible	
Serial No.	BA-16016	Location	GROUND TREATMENT BUILDING
Model No.	44-213MIP	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	W&T	General Ledger No.	
Vendor ID	W&T	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FCP-600	FERRIC CHLORIDE PUMP - 1	PM		Yes		No

Safety Note

MOTER IS G.E. 1/4HP MODEL NO. 5KC32GN13J 1725RPM
PALUSATION DAMPNER IS MODEL NO. 87003-30 SER. NO. 98303B

Nameplate Information

Equipment No.	FFP-710	FILTERPRESS FEED PUMP	
Equipment Type	FFP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FH-G-302-22	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ABLE	General Ledger No.	
Vendor ID	ABLE	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FFP-710	FILTER-PRESS FEED PUMP - BY ABLE	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FFP-711	FILTERPRESS FEED PUMP	
Equipment Type	FFP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FH-G-302-22	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ABLE	General Ledger No.
Vendor ID	ABLE	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$824.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FFP-710	FILTER-PRESS FEED PUMP - BY ABLE	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FFP-712	FILTERPRESS FEED PUMP	
Equipment Type	FFP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FH-G-302-22	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ABLE	General Ledger No.	
Vendor ID	ABLE	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FFP-710	FILTER-PRESS FEED PUMP - BY ABLE	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FFP-713	FILTERPRESS FEED PUMP	
Equipment Type	FFP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FH-G-302-22	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ABLE	General Ledger No.	
Vendor ID	ABLE	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FFP-710	FILTER-PRESS FEED PUMP - BY ABLE	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FILTERS	CONTROL CABINENTS	
Equipment Type		Person Responsible	
Serial No.		Location	ON SITE-OFF SITE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CONCAB	INSPECTION FOR FILTERS	PM		Yes		No
TP-510	TERTIARY PUMPS/OIL LEVELS	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	FIRE-EXT	FIRE EXTINGUISHERS	
Equipment Type		Person Responsible	
Serial No.		Location	IN ALL BUILDINGS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	FIRST-3	FIRST AID STATIONS	
Equipment Type		Person Responsible	
Serial No.		Location	GTB, TRUCKS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	FIT-00-LIC-635	LIQUID LEVEL TANSMITTER-PHOSPHORIC ACID	
Equipment Type	FIT	Person Responsible	
Serial No.	95W013410	Location	GROUND TREATMENT BUILDING
Model No.	50LT4100	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	F & P	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No /Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT-00-LIT-401	LIQUID LEVEL TRANSMITTER-TERTIRAY TANK	
Equipment Type	FIT	Person Responsible	
Serial No.	95W013055	Location	GROUND TREATMENT BUILDING
Model No.	50LT4100	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	F & P	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT-00-LIT-531	LIQUID LEVEL TRANSMITTER-EFFLUENT TANK	
Equipment Type	FIT	Person Responsible	
Serial No.	95W025676	Location	GROUND TREATMENT BUILDING
Model No.	50LT4100	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	F&P	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Equipment Report (Full List)

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT-00-LTC-602	LIQUID LEVEL TRANSITTER-FERRIC TANK	
Equipment Type	FIT	Person Responsible	
Serial No.	95W013411	Location	GROUND TREATMENT BUILDING
Model No.	50LT4100	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	F & P	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

WHEN REMOVING THIS METER, USE A FACE SHEILD, AND GLOVES FOR YOUR PROTECTION.

Nameplate Information

Equipment Report (Full List)

Equipment No.	FIT-221	FLOW TRANSMITTER	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	SLUDGE PUMP HOUSE
Model No.	# 50XM1000	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	CCI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT-222	FLOW TRANSMITTR	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	SLUDGE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	CCI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Equipment Report (Full List)

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT-524	FLOW TRANSMITTER BY-PASS FILTERS	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	# 50XM1000	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.
Vendor ID	CCI	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	FIT-551	FLOW TRANSMITTER TO S. GAC	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	# 50XM1000	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	CCI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT-552	FLOW TRANSMITTER TO N. GAC	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	# 50XM1000	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	CCI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT-561	FINAL FLOW RECORDER STRIP CHART	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	4200	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	SEECO	General Ledger No.
Vendor ID	CCI	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-561	FINAL FLOW RECORDER STRIP CHART	PM		Yes		No

Safety Note

FINAL SAMPLING STATION HAS ALSO TBI BAILEY PH METER MODEL NO. E67-37-1
AND A CONDUCTIVITY TRANSMITTER MODEL NO E-67-34. THSER IS ALOS AN AUTOMATIC SAMPLER, EXTRACTOR AND REFRIGERATOR. MAGNETIC FLOWMETER AND SIGNAL CONVERTER-X-7400LW
TEMPERATURE TRANSMITTER- 293264, RTD AND TRERMOWELL ASSEMBLY-77232,

Nameplate Information

Equipment Report (Full List)

Equipment No.	FIT321	FLOW TRANSMITTER	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	SLUDGE PUMP HOUSE
Model No.	#50XM1000	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	CCI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FIT322	FLOW TRANSMITTER	
Equipment Type	FIT	Person Responsible	
Serial No.		Location	SLUDGE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	F & P	General Ledger No.	
Vendor ID	CCI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Equipment Report (Full List)

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FIT-221	FLOW TRANSMITTER	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FP-721	FILTER PRESS	
Equipment Type	FP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	JWI	General Ledger No.	
Vendor ID	JWI	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FFP-721	FILTER PRESS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FP-722	FILTER PRESS	
Equipment Type	FP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	JWI	General Ledger No.
Vendor ID	JWI	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FFP-721	FILTER PRESS	PM		Yes		No

Safety Note

FOR EQUIP INFORMATION REFURE TO PAP-630

Nameplate Information

Equipment No.	FP-723	FILTER PRESS	
Equipment Type	FP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	JWI	General Ledger No.
Vendor ID	JWI	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FFP-721	FILTER PRESS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FPH-000-HYD	FLUSH AND PUMP HYDRANTS	
Equipment Type	FPB	Person Responsible	
Serial No.		Location	ON SITE GROUNDS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPH-580-1	RECIRULATION PUMP IN FIRE PUMP HOUSE	PM		Yes		No

Safety Note

OPEN HYDRANTS ON SITE GROUNDS AND FLUSH FOR ABOUT 5 MINS. SHUT OFF FLOW AT HYDRANT USING A "T" HANDLE CLOSING THE LOWER (UNDER GROUND VALVE) AT HYDRANT, LEAVING THE VALVE AT THE HYDRANT OPEN. NEXT USE THE PARASTALTIC PUMP, PUMP OUT THE WATER IN THE HYDRANT, TO KEEP THE HYDRANT FROM FREEZING IN THE WINTER. YOU CAN LEAVE THE HYDRANT VALVE OPEN, AND THE CAP OFF.

Nameplate Information

Equipment Report (Full List)

Equipment No.	FPH-580-1	RECIRULATION PUMP	
Equipment Type	FPB	Person Responsible	
Serial No.		Location	FIRE PUMP HOUSE
Model No.	98559	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	JCC	General Ledger No.	
Vendor ID	JCC	Asset No.	
Cost Center		Service Code	
Department	FPH	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPH-580-1	RECIRULATION PUMP IN FIRE PUMP HOUSE	PM		Yes		No

Safety Note

MOTOR IS A 2H.P AT 1730 RPM

Nameplate Information

Equipment No.	FPH-580-GP	PSI PUMP	
Equipment Type	FPB	Person Responsible	
Serial No.		Location	FIRE PUMP HOUSE
Model No.	C9523	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	GP	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	FPH	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPH-580-1	RECIRULATION PUMP IN FIRE PUMP HOUSE	PM		Yes		No

Safety Note

MOTOR/SER. NO. 1886883

Nameplate Information

Equipment No.	FPH-580-P	MAIN FIREWATER PUMP	
Equipment Type	FPB	Person Responsible	
Serial No.	931-9323-02-1	Location	FIRE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	JCC	General Ledger No.
Vendor ID	JCC	Asset No.
Cost Center		Service Code
Department	FPH	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPH-580-1	RECIRULATION PUMP IN FIRE PUMP HOUSE	PM		Yes		No

Safety Note

MOTOR/SER. WH-95
PUMPS 750GPM

Nameplate Information

Equipment No.	FPH-580-UH	FIRE BUILDING UNIT HEATER	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	FIRE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPH-580-1	RECIRULATION PUMP IN FIRE PUMP HOUSE	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	FPH-HW	HOT WATER HEATER	
Equipment Type	FPB	Person Responsible	
Serial No.	C955237	Location	FIRE PUMP HOUSE
Model No.	CBN0745	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ITT-AC PUMP	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	FPH	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPH-580-1	RECIRULATION PUMP IN FIRE PUMP HOUSE	PM		Yes		No
FPH-HW	FIRE WATER PUMP HOUSE - WATER HEATER	PM	3.00	No		No

Safety Note

Nameplate Information

Equipment No.	FPSP-01	FREEZE PROTECTION SYSTEM PANEL	
Equipment Type		Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.	DRWG NO D-95RC031-	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	RCCD	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPSP-00	FREEZE PROTECTION SYSTEM PANEL			Yes		No

Safety Note

Nameplate Information

Equipment No.	FPSP-02	FREEZE PROTECTION SYSTEM PANEL	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	DRWG NO 95RC031-E3	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	RCCD	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
FPSP-00	FREEZE PROTECTION SYSTEM PANEL			Yes		No

Safety Note

Nameplate Information

Equipment No.	GAC	CARBON VESSELS	
Equipment Type		Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	10	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	CCC	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

[redacted]y Note

The GAC was installed by calgon. These vessels are 10 ft. in diameter, and have a side wall depth of 10fr. The vessel capacities are, bed volume, 4675 gals. vessel volume is 9020 gal.

Nameplate Information

Equipment No.	GAC-551-A- SE	CARBON VESSEL 551-A SOUTH EAST	
Equipment Type	GAC	Person Responsible	
Serial No.	9086-1	Location	GROUND TREATMENT BUILDING
Model No.	10	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	CALGON	General Ledger No.
Vendor ID		Asset No.
Cost Center		Service Code
Department		User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
[redacted]aterial Cost	$0.00	User-defined Field 9
[redacted]re-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GAC-551	GALGON CARBON VESSELS		3.00	Yes		Yes

Safety Note

Task Hazard Assessment:
Comprssed Air: Use coupler cables on hose and safety pins.
Flying Debris: Wear safety glasses.
Noise Exposure: Use hearing protection if needed.
Slip, Trip, Fall: Good housekeeping, Keep floors clean and clear, use cones if necessary to worn others of work area.
Skin Exposure: Wear nitrile gloves.
Confined Space: (Vessel inspection only) Follow all confinded space procedures for GAC Tanks.

Nameplate Information

Equipment Report (Full List)

Equipment No.	GAC-551-B-NE	CARBON VESSEL 551-B NORTH EAST	
Equipment Type	GAC	Person Responsible	
Serial No.	9086-2	Location	GROUND TREATMENT BUILDING
Model No.	10	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	CALGON	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GAC-551	GALGON CARBON VESSELS		3.00	Yes		Yes

Safety Note

Task Hazard Assessment:
Comprssed Air: Use coupler cables on hose and safety pins.
Flying Debris: Wear safety glasses.
Noise Exposure: Use hearing protection if needed.
Slip, Trip, Fall: Good housekeeping, Keep floors clean and clear, use cones if necessary to worn others of work area.
Skin Exposure: Wear nitrile gloves.
Confined Space: (Vessel inspection only) Follow all confinded space procedures for GAC Tanks.

Nameplate Information

Equipment Report (Full List)

Equipment No.	GAC-552-A SW	CARBON VESSEL 552-A SOUTH WEST	
Equipment Type	GAC	Person Responsible	
Serial No.	9087-2	Location	GROUND TREATMENT BUILDING
Model No.	10	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	CALGON	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GAC-551	GALGON CARBON VESSELS		3.00	Yes		Yes

Safety Note

Task Hazard Assessment:
Imprssed Air: Use coupler cables on hose and safety pins.
Flying Debris: Wear safety glasses.
Noise Exposure: Use hearing protection if needed.
Slip, Trip, Fall: Good housekeeping, Keep floors clean and clear, use cones if necessary to worn others of work area.
Skin Exposure: Wear nitrile gloves.
Confined Space: (Vessel inspection only) Follow all confinded space procedures for GAC Tanks.

Nameplate Information

Equipment Report (Full List)

Equipment No.	GAC-552-B-NW	CARBON VESSEL 552-B NORTH WEST	
Equipment Type	GAC	Person Responsible	
Serial No.	9087-1	Location	GROUND TREATMENT BUILDING
Model No.	10	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	CALGON	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GAC-551	GALGON CARBON VESSELS		3.00	Yes		Yes

Safety Note

Task Hazard Assessment:
Comprssed Air: Use coupler cables on hose and safety pins.
Flying Debris: Wear safety glasses.
Noise Exposure: Use hearing protection if needed.
Slip, Trip, Fall: Good housekeeping, Keep floors clean and clear, use cones if necessary to worn others of work area.
Skin Exposure: Wear nitrile gloves.
Confined Space: (Vessel inspection only) Follow all confinded space procedures for GAC Tanks.

Nameplate Information

Equipment Report (Full List)

Equipment No.	GENERATOR - 1	LP GAS POWEERED GENERATOR SYSTEM- CC1	
Equipment Type	GEN	Person Responsible	
Serial No.	F7404A/001	Location	TOP OF CREEK BED
Model No.	G45F1	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	MICHIGAN CAT	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date	5/11/01	User-defined Field 3	
Warranty Expiration Date	5/10/02	User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code	GENERATOR	User-defined Field 10	

Item No	Description	Qty	Site
G 116-001	GENERATOR, REGULATOR (GAS TRAIN)		
G 342-062	GENERATOR, RADIATOR HOSE, TOP		
G 342-063	GENERATOR, RADIATOR HOSE BOTTOM		
G 622-333	GENERATOR, LOP SWITCH SENDER		
G 622-341	GENERATOR, SOLENOID (GAS TRAIN)		
G 922-216	GENERATOR, SPARTNER KIT (SHUNT)		
G 952-003	GENERATOR, BELT		
G 952-011	GENERATOR, SPARK PLUG		
G 952-012	GENERATOR, CABLE KIT HT		
G 952-013	GENERATOR, IGNITION COIL		
G 952-014	GENERATOR, OIL FILTER ELEMENT		
G 952-313	GENERATOR, WATER PUMP GASKET		
G 952-331	GENERATOR, THERMOSTAT		
G 952-437	GENERATOR, VALVE SPRING-INTAKE		
G 952-438	GENERATOR, VALVE SPRING, EXHAUST		
G 952-439	GENERATOR, FRONT OIL SEAL, REAR ENTRY		
G 952-443	GENERATOR, FRONT OIL SEAL, FRONT ENTRY		
G 952-464	GENERATOR, GASKET KIT, BOTTOM		
G 952-485	GENERATOR, ROCKER COVER GASKET		
G 952-493	GENERATOR, INLET VALVE		
G 952-497	GENERATOR, REAR OIL SEAL		
G 952-511	GENERATOR, GASKET KIT, TOP		
G 901-047	GENERATOR, AIR FILTER ELEMENT		

Component Equipment No /Description

Task No	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CAT GENERATOR	LP GAS POWERED GENERATOR SYSTEM CC1 & CC2	PM	3.00	Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GENERATOR - 2	LP GAS POWERED GENERATOR SYSTEM-CC2	
Equipment Type	GEN	Person Responsible	
Serial No.		Location	ON RIVER RD
Model No.	G45F1	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	MICHIGAN CAT	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date	5/11/01	User-defined Field 3	
Warranty Expiration Date	5/10/02	User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code	GENERATOR	User-defined Field 10	

Item No.	Description	Qty	Site
G 116-001	GENERATOR, REGULATOR (GAS TRAIN)		
G 342-062	GENERATOR, RADIATOR HOSE, TOP		
G 342-063	GENERATOR, RADIATOR HOSE BOTTOM		
G 622-333	GENERATOR, LOP SWITCH SENDER		
G 622-341	GENERATOR, SOLENOID (GAS TRAIN)		
G 922-216	GENERATOR, SPARTNER KIT (SHUNT)		
G 952-003	GENERATOR, BELT		
G 952-011	GENERATOR, SPARK PLUG		
G 952-012	GENERATOR, CABLE KIT HT		
G 952-013	GENERATOR, IGNITION COIL		
G 952-014	GENERATOR, OIL FILTER ELEMENT		
G 952-313	GENERATOR, WATER PUMP GASKET		
G 952-331	GENERATOR, THERMOSTAT		
G 952-437	GENERATOR, VALVE SPRING-INTAKE		
G 952-438	GENERATOR, VALVE SPRING, EXHAUST		
G 952-439	GENERATOR, FRONT OIL SEAL, REAR ENTRY		
G 952-443	GENERATOR, FRONT OIL SEAL, FRONT ENTRY		
G 952-464	GENERATOR, GASKET KIT, BOTTOM		
G 952-485	GENERATOR, ROCKER COVER GASKET		
G 952-493	GENERATOR, INLET VALVE		
G 952-497	GENERATOR, REAR OIL SEAL		
G 952-511	GENERATOR, GASKET KIT, TOP		
G 901-047	GENERATOR, AIR FILTER ELEMENT		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
CAT GENERATOR	LP GAS POWERED GENERATOR SYSTEM CC1 & CC2	PM	3.00	Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-971-A	GAS UNIT HEATER-NORTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Equ. No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-971-B	GAS UNIT HEATER-NORTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-971-C	GAS UNIT HEATER-NORTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	H&H	General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-971-D	GAS UNIT HEATER-WEST	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.
Vendor ID	H&H	Asset No.
Cost Center		Service Code
Department	H&A	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	GUH-971-E	GAS UINT HEATER-WEST	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.
Vendor ID	H&H	Asset No.
Cost Center		Service Code
Department	H&A	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-971-F	GAS UNIT HEATER-SOTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.
Vendor ID	H&H	Asset No.
Cost Center		Service Code
Department	H&A	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-971-G	GAS UNIT HEATER-SOUTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.
Vendor ID	H&H	Asset No.
Cost Center		Service Code
Department	H&A	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-971-H	GAS UINT HEATER-SOUTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-972-A	GAS UNIT HEATER-WEST	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-972-B	GAS UNIT HEATER-EAST	
Equipment Type	AHU	Person Responsible	
Serial No.	ATK65M4N768	Location	SLUDGE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-A	GAS UNIT HEATER-EAST	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-B	GAS UNIT HEATER-SOUTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-C	GAS UNIT HEATER-SOUTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.
Vendor ID	H&H	Asset No.
Cost Center		Service Code
Department	H&A	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	GUH-973-D	GAS UNIT HEATER-WEST	
Equipment Type	AHU	Person Responsible	
Serial No.	ATK65M4N76810	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-E	GAS UNIT HEATER-WEST	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	H&H	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-F	GAS UNIT HEATER-WEST	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-G	GAS UNIT HEATER-NORTH	
Equipment Type	AHU	Person Responsible	
Serial No.	ATK65M4N76821	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-H	GAS UNIT HEATER-EAST	
Equipment Type	AHU	Person Responsible	
Serial No.	ATK65M4N76826	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-973-I	GAS UNIT HEATER-EAST	
Equipment Type	AHU	Person Responsible	
Serial No.	ATK65M4N76823	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-974-A	GAS UNIT HEATER-NORTH	
Equipment Type	AHU	Person Responsible	
Serial No.	ATK65M4N76799	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-974-B	GAS UNIT HEATER-WEST	
Equipment Type	AHU	Person Responsible	
Serial No.	ATK65M4N76803	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
H	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-975	GAS UNIT HEATER-EAST	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-976	GAS UNIT HEATER	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	ELETRICAL ROOM
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	REZ	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-977-A	GAS UNIT HEATER-SOUTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-977-B	GAS UNIT HEATER-SOUTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-977-C	GAS UNIT HEATER-NORTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Note

Nameplate Information

Equipment No.	GUH-977D	GAS UNIT HEATER-NORTH	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	BLOWER BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	JONES	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-978-A	GAS UNIT HEATER-PUMPING BLD	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.
Vendor ID	H&H	Asset No.
Cost Center		Service Code
Department	H&A	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	GUH-978-B	GAS UINT HERATER-PUMPING BLD.	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	SLUDGE PUMP HOUSE
Model No.	FE	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	REZ	General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Entry Note

Nameplate Information

Equipment No.	GUH-980	GAS UNIT HEATER-TOU BLD	
Equipment Type	AHU	Person Responsible	
Serial No.		Location	THERMAL OXIDATION BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	H&H	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
GUH	GAS UNIT HEATERS THROUGH OUT PLANT SITE	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	John Deere-870	John Deere Tractor-870	
Equipment Type	LE	Person Responsible	DL
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	MODEL 870	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	POWER SHOP	General Ledger No.
Vendor ID	POWER SHOP	Asset No.
Cost Center		Service Code
Department		User-defined Field 1
Purchase Date	5/ 1/97	User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code	LAWN	User-defined Field 10

Item No.	Description	Qty	Site
CH11436 O'RING	O'RING FOR FRONT DRIVE UNIT - JOHN DEERE TRACTOR		
CH14662 SEAL	SEAL FOR FRONT DRIVE UNIT-JOHN DEERE TRACTOR		
M803736 GASKET	GASKET FOR FRONT DRIVE UNIT- JOHN DEERE TRACTOR		
M804187 SEAL	SEAL FOR FRONT DRIVE UNIT- JOHN DEERE TRACTOR		
M804203-BUSHING	BUSHING FOR JOHN DEERE-FRONT AXCEL		
T111383	FUEL FILTER FOR JOHN DEERE TRACTOR		
TY6296 LUBRECANT	LUBRICANT FOR FRONT DRIVE UNIT-JOHN DEERE TRACTOR		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
John Deere-870	JOHN DEERE TRACTOR - 870	PM	3.00	Yes		No

Safety Note

RECOGNIZE SAFETY INFORMATION;
FOLLOW SAFETY INSTRUCTIONS;
PROTECT CHILDREN;
PREVENT MACHINE RUNAWAY;
USE SEAT BELT PROPERLY;
AVOID TIPPING;
PARK MACHINE SAFELY;
KEEP RIDERS OFF MACHINE;
HANDLE FUEL SAFELY-AVOID FIRES;
PREPARE FOR EMERGENCIES;
WEAR PROTECTIVE CLOTHING;
STAY CLEAR OF ROTATIONG DRIVELINES;
USE SAFETY LIGHTS AND DIVICES;
USE A SAFETY CHAIN;
KEEP ROPS INSTALLED PROPERLY;
PRACTICE SAFE MAINTENANCE;
AVOID HIGH-PRESSURES FLUIDS;
PREVENT BATTERY EXPLOSIONS;
PRENENT ACID BURNS;
SERVICE MACHINES SAFELY;
WORK IN VENTILATED AREA;
ILLUMINATE WORK AREA SAFELY;
SERVICE TIRES SAFELY;
WORK SAFE:

Nameplate Information

Equipment No.	LFS-645	LIME FEED SYSTEM	
Equipment Type		Person Responsible	
Serial No.		Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ZIMPRO	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

REFER TO FILE: LFS-645 ; Zimpro was on site to do start up on April 25, 1996. No lime was ordered to be used at this time. Zimpro went through start-up using water thourgh the system. Comments that were make are; The technician discovered a DCS wiring deign problem along with a conflict between the slurry pump rating and slurry make-up water. Also, final control points from checkout period are obsolete since no lime was fed through the system. Operators will determine needed control settings if lime is ever needed.

Nameplate Information

Equipment No.	M-701	SLUDGE TANK MIXER	
Equipment Type	STM	Person Responsible	
Serial No.	95E1676609401	Location	OUTSIDE
Model No.	75-Q5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	LIGHTNIN	General Ledger No.
Vendor ID	S&L	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
M-701	CHANGE OIL IN GEAR BOX, GREASE UNIT	PM		Yes		No

Safety Note

MIXER GEARBOX MODEL NO. 75-Q-5 SER. NO.95E179401

Nameplate Information

Equipment Report (Full List)

Equipment No.	MAN-000	MANHOLES, TO BE CHECKED	
Equipment Type		Person Responsible	
Serial No.		Location	ON SITE GROUNDS
Model No.		Sub-location 1	OFF SITE
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
MAN-000	MANHOLES TO BE CHECK AND PUMPED OF STANDING WATER	PM		Yes		No

Safety Note

ANHOLES AND PULL PORTS TO BE CHECKED AND PUMP OUT STANDING WATER

Nameplate Information

Equipment No.	Meter Readings-000	Perform meter reading on equipment	
Equipment Type		Person Responsible	
Serial No.		Location	ALL BUILDINGS
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
-parts Code		User-defined Field 10	

Equipment Report (Full List)

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
MR-000	Take Equipment Meter Readings			Yes		No

Safety Note

Record Totalizer Meter Readings every 3 Months, to check the Hrs. run on equipment, for P.M. reasons.

Nameplate Information

Equipment No.	MONORAIL-1	MOMORAIL TO FILTER PRESS 722	
Equipment Type	MR	Person Responsible	
Serial No.	WR3B-113-WHD	Location	SLUDGE TREATMENT BUILDING
Model No.	WRMT-6014-35-3	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	SE&SC	General Ledger No.
Vendor ID	SE&SC	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
MONO-1	MONORAIL LIFTS FOR THE FILTER PRESSES	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	MONORAIL-2	MONORAIL TO FILTER PRESS 721	
Equipment Type	MR	Person Responsible	
Serial No.	WR3B-114-WHD	Location	SLUDGE TREATMENT BUILDING
Model No.	WRMT-2028-35-3	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	SE&SC	General Ledger No.	
Vendor ID	SE&SC	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
MONO-1	MONORAIL LIFTS FOR THE FILTER PRESSES	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	MONORAIL-3	MONORAIL TO FILTER PRESS 723	
Equipment Type	MR	Person Responsible	
Serial No.	WR3B-115-WHD	Location	SLUDGE TREATMENT BUILDING
Model No.	WRMT-6014-35-3	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	SE&SC	General Ledger No.	
Vendor ID	SE&SC	Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
MONO-1	MONORAIL LIFTS FOR THE FILTER PRESSES	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	MONORAIL-4	1 TON HOIST IN GTB	
Equipment Type	MR	Person Responsible	
Serial No.	WR3B-106-WHD	Location	GROUND TREATMENT BUILDING
Model No.	WRMT-2028-35-3	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	SE&SC	General Ledger No.
Vendor ID		Asset No.
Cost Center		Service Code
Department	OTHER	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
MONO-1	MONORAIL LIFTS FOR THE FILTER PRESSES	PM		Yes		Yes

Safety Note

Nameplate Information

Equipment No.	NPWS-935-P1	NON-POTABLE WATER SYSTER PUMP 1	
Equipment Type	NPWS	Person Responsible	
Serial No.	950031-P1	Location	GROUND TREATMENT BUILDING
Model No.	5A-5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	SYN	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
NPWS-P1	NON-POTABLE WATER SYSTEM	PM		Yes		Yes

Safety Note

MOTOR/MODEL NO. 8073A SER. NO. Y60Y38ROOF

Nameplate Information

Equipment No.	NPWS-935-P2	NON POTABLE WATER SYSTEM PUMP 2	
Equipment Type	NPWS	Person Responsible	
Serial No.	950031-P1	Location	GROUND TREATMENT BUILDING
Model No.	5A-5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	SYN	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
NPWS-P1	NON-POTABLE WATER SYSTEM	PM		Yes		Yes

Safety Note

MOTOR/MODEL NO. 8073A SER. NO. Y06Y038ROOF

Nameplate Information

Equipment No.	NPWS-935-P3	NON POTABLE WATER SYSTEM PUMP 3	
Equipment Type	NPWS	Person Responsible	
Serial No.	9050031-P1	Location	GROUND TREATMENT BUILDING
Model No.	5A-5	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	SYN	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
NPWS-P1	NON-POTABLE WATER SYSTEM	PM		Yes		Yes

Safety Note

MOTOR/ MODED 8073A SER NO. Y06Y038FOOF

Nameplate Information

Equipment No.	OSC	SITE SAFETY INSPECTION	
Equipment Type		Person Responsible	
Serial No.		Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Template Information

Equipment No.	PAP-630	PHOSPHORIC ACID PUMPS 1	
Equipment Type	PAP	Person Responsible	
Serial No.	BA-16028	Location	GROUND TREATMENT BUILDING
Model No.	44-213	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	W&T	General Ledger No.	
Vendor ID	W&T	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Equipment Report (Full List)

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PAP-630	PHOSPHORIC ACID PUMPS	PM		Yes		No

Safety Note

MOTOR INFO 1/4H.P. 115/230V MODEL NO. 5KC326BN13J BACK PRESSURE VALVE SETTING AT 15 PSIG, PRESSURE RELIEF VALVE AT 50 PSIG. PAL DAMPNER: 87003-30 SER. 98303E
PREVENTIVE MAINT. KIT 4-26142
PARTS AND SERVICE:
R & S TECHNICAL
13684 BECKWITH DR
LOWELL MI 49331
616-897-7041

Nameplate Information

Equipment No.	PAP-631	PHOSPHORIC ACID PUMPS 2	
Equipment Type	PAP	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	44-213	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	W&T	General Ledger No.	
Vendor ID	W&T	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PAP-630	PHOSPHORIC ACID PUMPS	PM		Yes		No

Safety Note

MOTOR INFO 1/4H.P. 115/230V MODEL NO. 5KC326BN13J BACK PRESSURE VALVE SETTING AT 15 PSIG, PRESSURE RELIEF VALVE AT 50 PSIG. . PAL DAMPNER: 87003-30 SER. 98303E
PREVENTIVE MAINT. KIT 4-26142
PARTS AND SERVICE:
R & S TECHNICAL
13684 BECKWITH DR
LOWELL MI 49331
616-897-7041

Nameplate Information

Equipment Report (Full List)

Equipment No.	PAP-632	PHOSPHORIC ACID PUMP 3	
Equipment Type	PAP	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	44-213	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	W&T	General Ledger No.	
Vendor ID	W&T	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PAP-630	PHOSPHORIC ACID PUMPS	PM		Yes		No

Safety Note

MOTOR INFO 1/4H.P. 115/230V MODEL NO. 5KC326BN13J BACK PRESSURE VALVE SETTING AT 15 PSIG, PRESSURE RELIEF VALVE AT 50 PSIG. PAL DAMPNER: 87003-30 SER. 98303E
PREVENTIVE MAINT. KIT 4-26142
PARTS AND SERVICE:
R & S TECHNICAL
13684 BECKWITH DR
LOWELL MI 49331
616-897-7041

Nameplate Information

Equipment Report (Full List)

Equipment No.	PCT-201-SP	SCUM PUMP INSIDE PCT-201	
Equipment Type		Person Responsible	
Serial No.		Location	PCT-201
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP	SCUM PUMP IN PCT-201	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	PCT-201-W	DECANT WINCH INSIDE PCT 201	
Equipment Type		Person Responsible	
Serial No.		Location	PCT-201
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
[illegible]-201-W	WINCH INSIDE OF PCT 201			Yes		No

Safety Note

Nameplate Information

Equipment No.	PCT-201/202	PCT MANWAYS	
Equipment Type	PCT	Person Responsible	
Serial No.		Location	PCT-201
Model No.		Sub-location 1	PCT-202
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	H&H	General Ledger No.
Vendor ID	TTT	Asset No.
Cost Center		Service Code
Department	OTHER	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PCT-201/202	GASKET MAINTENANCE/OR REPLACEMENT	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	PCT-202-SP	SCUM PUMP INSIDE PCT-202	
Equipment Type		Person Responsible	
Serial No.		Location	PCT-202
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP	SCUM PUMP IN PCT-201	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	PCT-202-W	DEDCANT WINCH INSIDE PCT 202	
Equipment Type		Person Responsible	
Serial No.		Location	PCT-202
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

y Note

Nameplate Information

Equipment No.	PCT-301-SP	SCUM PUMP INSIDE PCT-301	
Equipment Type		Person Responsible	
Serial No.		Location	PCT-301
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
e-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP	SCUM PUMP IN PCT-201	PM		Yes		No

Safety Note

Test run pump to be sure it is wroking.

Nameplate Information

Equipment No.	PCT-302-SP	SUM PUMP NSIDE PCT-302	
Equipment Type		Person Responsible	
Serial No.		Location	PCT-302
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP	SCUM PUMP IN PCT-201	PM		Yes		No

Safety Note

Test run pump to be sure pump is working.

Nameplate Information

Equipment No.	PMP-620	POLYMER METERING PUMP 1	
Equipment Type	PMP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PMP-620	POLYMER FEED SYSTEM- VISUAL INSPECTION AND CALIBRATION	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	PMP-621	POLYMER METERING PUMP 2	
Equipment Type	PMP	Person Responsible	
Serial No.	13495	Location	SLUDGE TREATMENT BUILDING
Model No.	PB 1000-8	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	STRANCO	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PMP-620	POLYMER FEED SYSTEM- VISUAL INSPECTION AND CALIBRATION	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	PMP-622	POLYMER MERERING PUMP 3	
Equipment Type	PMP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PMP-620	POLYMER FEED SYSTEM- VISUAL INSPECTION AND CALIBRATION	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	POWER WASHER	POWERED PRESSURE WASHER	
Equipment Type		Person Responsible	
Serial No.	203219	Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	DIRECT LINE	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PRESSURE WASHER	GASOLINE PRESSURE WASHER		3.00	Yes		No

Safety Note

Nameplate Information

Equipment No.	PWP-742	PLATE WASH PUMP FOR PRESS	
Equipment Type	FFP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ABLE	General Ledger No.
Vendor ID	ABLE	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code	PWP-0	User-defined Field 10

Item No.	Description	Qty	Site
E 011 G,H,Q,	OIL SEAL-PLATE WASH	3.00	
E 067A	PISTON SEAL RING-PLATE WASH	3.00	
E 335 PC/PD 50	GUIDE RIING-PLATE WASH	3.00	
E 420 PC/PD	PISTON O-RING-PLATE WASH	3.00	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
PWP-742	PRESS WASH PUMP	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	RSP-220	RETURN SLUDGE PUMP TO 1ST STAGE	
Equipment Type	RSP	Person Responsible	
Serial No.	891928B	Location	SLUDGE PUMP HOUSE
Model No.	HOC	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
RSP-220	RETURN SLUDGE PUMP	PM		Yes		No

Safety Note

RPM IS 1180 SIZE IS 4X3X10 LUBE IS OIL
MOTER IS BY U.S. 10 HP. 3PH 1170 RPM I.D. NO. H323A-50-Y04Y044

Nameplate Information

Equipment No.	RSP-221	RETURN SLUDGE TO 1ST STAGE	
Equipment Type	RSP	Person Responsible	
Serial No.	891928A	Location	SLUDGE PUMP HOUSE
Model No.	HOC	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
RSP-220	RETURN SLUDGE PUMP	PM		Yes		No

Safety Note

PUMP IS 1180 RPM SIZE OF 4X3X10 LUBE IS OIL
MOTOR IS BY U.S. 10 HP. 3PH. 1170 RPM I.D. NO. H323A-50-Y04Y044

Nameplate Information

Equipment No.	RSP-222	RETURN SLUDGE TO 1ST STAGE	
Equipment Type	RSP	Person Responsible	
Serial No.	891928D	Location	SLUDGE PUMP HOUSE
Model No.	HOC	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.
Vendor ID	I R	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
RSP-220	RETURN SLUDGE PUMP	PM		Yes		No

Safety Note

PUMP IS 1180 RPM SIZE IS 4X3X10 LUBE IS OIL
MOTOR IS BY U.S. 10 HP. 3PH 1170 RPM I.D. NO 323A-50-Y04Y044

Nameplate Information

Equipment Report (Full List)

Equipment No.	RSP-320	RETURN SLUDGE PUMP TO 2ND STAGE	
Equipment Type	RSP	Person Responsible	
Serial No.	891928E	Location	SLUDGE PUMP HOUSE
Model No.	HOC	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
RSP-220	RETURN SLUDGE PUMP	PM		Yes		No

Safety Note

MOTOR BY U.S. 10 HP. 3PH. 1170RPM I.D. H323A-50-Y04Y044

Nameplate Information

Equipment No.	RSP-321	RETURN SLUDGE PUMP TO 2ND STAGE	
Equipment Type	RSP	Person Responsible	
Serial No.	891928F	Location	SLUDGE PUMP HOUSE
Model No.	HOC	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
RSP-220	RETURN SLUDGE PUMP	PM		Yes		No

Safety Note

MOTOR BY U.S. 10 HP 3PH 1170 RPM I.D. H323A-50-Y04Y044

Nameplate Information

Equipment No.	RSP-322	RETURN SLUDGE TO 2ND STAGE	
Equipment Type	RSP	Person Responsible	
Serial No.	891928C	Location	SLUDGE PUMP HOUSE
Model No.	HOC	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
RSP-220	RETURN SLUDGE PUMP	PM		Yes		No

Safety Note

MOTOR BY U.S. 10HP 3PH 1170RPM I.D. H323A-50-Y04Y044

Nameplate Information

Equipment No.	SCBA	SELF CONTAINED BREATHING APPARATUS	
Equipment Type		Person Responsible	
Serial No.		Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	SF-956	SUPPLY FAN E. MEZZANINE	
Equipment Type		Person Responsible	
Serial No.	144085-1	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	H&H	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

HAS 2 GREASE ZERTS THIS FAN IS USED TO BRING IN FRESH AIR INTO ELETC ROOM

Nameplate Information

Equipment No.	SF-960	SUPPLY FAN W.MEZZANINE	
Equipment Type		Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	H&A	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	SNAP-8245	SNAPPER SNOW BLOWER	
Equipment Type		Person Responsible	
Serial No.	85122457	Location	-
Model No.	8245	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	SNAPPER	General Ledger No.
Vendor ID	WHITE LAKE	Asset No.
Cost Center		Service Code
Department		User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date	12/ 1/99	User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SNAP-8245	SNOW BLOWER MAINTENANCE FOR EACH SEASON	PM		Yes		No

Work Note

Nameplate Information

Equipment No.	SP-130	SLUDGE VAULTS IN GTB& STB	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	GROUND TREATMENT BUILDING
Priority		Sub-location 2	ELETRICAL ROOM
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.
Vendor ID		Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP-130	SUMP PUMPS IN VAULTS. GTB & STB	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	SP-130-A	SUMP PUMP IN VAULT GTB	
Equipment Type	SP	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	3SE2042DS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	BARNS	General Ledger No.
Vendor ID	IPECO	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP-130	SUMP PUMPS IN VAULTS. GTB & STB	PM		Yes		No

Safety Note

NEW SEALS WERE SHIPPED TO INSTALL INTO THE PUMPS FROM IPECO. THESE PUMPS WERE INSTALLED WITH THE WRONG TYPE OF SEALS AT START-UP. SEAL PART NO. 71796

Nameplate Information

Equipment Report (Full List)

Equipment No.	SP-130-B	SUMP PUMP IN VALUT GTB	
Equipment Type	SP	Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.	3SE2042DS	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	BARNS	General Ledger No.	
Vendor ID	IPECO	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP-130	SUMP PUMPS IN VAULTS. GTB & STB	PM		Yes		No

Safety Note

EW SEALS WERE SHIPPED TO INSTALL INTO THE PUMPS FROM IPECO. THESE PUMPS WERE INSTALLED WITH THE RONG TYPE OF SEALS AT START-UP. SEAL PART NO. 71796
This pump was repaired and installed back in the vault on jan. 7, 1998..

Nameplate Information

Equipment No.	SP-131-A	SUMP PUMP IN VAULT STB	
Equipment Type	SP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	4SE7544L	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	BARNS	General Ledger No.	
Vendor ID	IPECO	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
e-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP-130	SUMP PUMPS IN VAULTS. GTB & STB	PM		Yes		No

Safety Note

NEW SEALS WERE SHIPPED TO INSTALL INTO THE PUMPS FROM IPECO. THESE PUMPS WERE INSTALLED WITH THE WRONG TYPE OF SEALS AT START-UP. SEAL PART NO. 060817

Nameplate Information

Equipment No.	SP-131-B	SUMP PUMP IN VAULT STB	
Equipment Type	SP	Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.	4SE7544L	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	BARNS	General Ledger No.
Vendor ID	IPECO	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SP-130	SUMP PUMPS IN VAULTS. GTB & STB	PM		Yes		No

Safety Note

NEW SEALS WERE SHIPPED TO INSTALL INTO THE PUMPS FROM IPECO. THESE PUMPS WERE INSTALLED WITH THE WRONG TYPE OF SEALS AT START-UP. SEAL PART NO. 060817

Nameplate Information

Equipment No.	SS-221-F	EIM CONTROL VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.	33123.3	Location	SLUDGE PUMP HOUSE
Model No.	E1195	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.	
Vendor ID	P-P EC	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

MOTOR PARAT NO 91C1151F50

Nameplate Information

Equipment No.	SS-221-G	EIM CONTROL VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.	33123.7	Location	SLUDGE PUMP HOUSE
Model No.	E1195	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.	
Vendor ID	P-P EC	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

MOTOR PART NO 91C1151F50

Nameplate Information

Equipment No.	SS-222-F	EIM CONTROL VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.	33123.1	Location	SLUDGE PUMP HOUSE
Model No.	E1195	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.
Vendor ID	P-P EC	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

MOTOR PART NO. 91C1151F50

Nameplate Information

Equipment No.	SS-222-G	EIM CONTROL VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.	33123.4	Location	SLUDGE PUMP HOUSE
Model No.	E1195	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.	
Vendor ID	P-P EC	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

MOTOR PART NO. 91C1151F50

Nameplate Information

Equipment No.	SS-321-F	EIM CONTROL VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.		Location	SLUDGE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.	
Vendor ID	P-P EC	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

MOTOR PART NO. 91C1151F510

Nameplate Information

Equipment No.	SS-321-G	EIM CONTROL VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.	33123.6	Location	SLUDGE PUMP HOUSE
Model No.	E1195	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.
Vendor ID	P-P EC	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	SS-322-F	EIM CONTOL VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.	33123.8	Location	SLUDGE PUMP HOUSE
Model No.	E1195	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.
Vendor ID	P-P EC	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

MOTOR PART NO. 91C1151F50

Nameplate Information

Equipment No.	SS-322-G	EIM CONTOR VALVES	
Equipment Type	EIM	Person Responsible	
Serial No.	33123.2	Location	SLUDGE PUMP HOUSE
Model No.	E1195	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	EIM	General Ledger No.
Vendor ID	P-P EC	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
SS-221	EIM CONTROL VALVES.	PM		Yes		No

Safety Note

MOTOR PART NO. 91C1151F50

Nameplate Information

Equipment No.	STP-211	SLUDGE TRANSFER PUMP TO SLUDGE HOLDING	
Equipment Type	STP	Person Responsible	
Serial No.	891927A	Location	SLUDGE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.
Vendor ID	I R	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
STP-211	SLUDGE TRANSFER PUMP	PM		Yes		No

Safety Note

PUMP SIZE IS 3X1.5X8 100GPM 1800RPM
MOTOR IS BY U.S. MODEL A431B 5HP 3PH 1750RPM ID X12V252R960F

Nameplate Information

Equipment No.	STP-212	SLUDGE TRANSFUR PUMP TO SLUDGE HOLDING	
Equipment Type	STP	Person Responsible	
Serial No.	891927B	Location	SLUDGE PUMP HOUSE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	I R	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
STP-211	SLUDGE TRANSFER PUMP	PM		Yes		No

Safety Note

PUMP SIZE IS 3X1.5X8 100GPM 1800RPM
MOTOR IS BY U.S. MODEL A431B 5HP 3PH 1750RPM ID X12V252R960F

Nameplate Information

Equipment No.	TF-521	TERTIARY FILTER 1	
Equipment Type	TF	Person Responsible	
Serial No.	1944-00152	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	ASB	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TF-521	TERTIARY FILTERS/CHECK AIR LIFTS AND AIR PRESSURES	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	TF-522	TERTIARY FILTER 2	
Equipment Type	TF	Person Responsible	
Serial No.	1944-00153	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	ASB	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TF-521	TERTIARY FILTERS/CHECK AIR LIFTS AND AIR PRESSURES	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	TF-523	TERTIARY FILTER 3	
Equipment Type	TF	Person Responsible	
Serial No.	1944-00154	Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	ASB	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TF-521	TERTIARY FILTERS/CHECK AIR LIFTS AND AIR PRESSURES	PM		Yes		No

Work Note

Nameplate Information

Equipment No.	TORO-000	TORO SNOWTHROWER	
Equipment Type		Person Responsible	
Serial No.	210000202	Location	-
Model No.	38172	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	ACE	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date	11/21/00	User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date	1/22/01	User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$422.94	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TORO-000	TORO SNOWTHROWER, MAINTENANCE		3.00	Yes		No

Safety Note

CAUTION; IMPROPER USE MAY RESULT IN LOSS OF FINGERS, HANDS OR FEET.!
USE A STICK, NOT YOUR HAND, TO REMOVE OBSTRUCTIONS FORM DISCHARGE CHUTE.!
CHECK AND CLEAR AREA FOR OBJECTS THAT COULD BE THROWN BY THE SNOWTHROWER.!
WEAR ADEQUATE WINTER CLOTHING, AND EYE PROTECTION.!
DO NOT OPERATE WHEN UNDER THE INFLUENCE OF ALCOHOL, OR OTHER DRUGS!.
REFUEL YOUR SNOWTHROWER CAREFULLY!
STORE YOUR SNOWTHROWER SAFELY!

Nameplate Information

Equipment No.	TOU-800-A	TOWER RE-CIRCULATION PUMP 1	
Equipment Type	TOU	Person Responsible	
Serial No.	883077A	Location	THERMAL OXIDATION BUILDING
Model No.	GRP	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	IPECO	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TOU-800	TOU COOLING PUMP/OIL LEVELS/GREASE	PM		Yes		No

Safety Note

PUMP IS 250 RPM AND SIZE OF 3X2X8
MOTOR IS BY SERMENS SER. NO IS H94T0117 H.P. IS 20

Nameplate Information

Equipment No.	TOU-800-B	TOWRE RE-CIRCULATION PUMP 2	
Equipment Type	TOU	Person Responsible	
Serial No.	883077A	Location	THERMAL OXIDATION BUILDING
Model No.	GRP	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	IPECO	General Ledger No.	
Vendor ID	I R	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TOU-800	TOU COOLING PUMP/OIL LEVELS/GREASE	PM		Yes		No

Note

PUMP SIZE IS 3X2X8 AT RPM OF 250
MOTOR IS BY SERMEN'S SER. NO IS H94T0117 AT A RPM OF 3525 H.P. 20

Nameplate Information

Equipment No.	TOU-800-PF	PURGE FAN ON THE TOU	
Equipment Type	TOU	Person Responsible	
Serial No.	C94T0080	Location	THERMAL OXIDATION BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID	WCAS	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TOU-800-PF	GREASE ZERTS/ON PURGE FAN	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	TOU-800-ST	SCRUBBER TANK ON THE TOU	
Equipment Type	TOU	Person Responsible	
Serial No.		Location	THERMAL OXIDATION BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TOU-800-ST	SCURBBER TOWER	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	TOU-800-TOU	THERMAL OXIDATION UNIT	
Equipment Type	TOU	Person Responsible	
[redacted]erial No.	928-01-695	Location	THERMAL OXIDATION BUILDING
[redacted]odel No.	1200-3-99-90	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	WCAS	General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OPRS	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code	TOU-0	User-defined Field 10	

Item No.	Description	Qty	Site
003866	FUSE, 9A, 250V [F4]		
003878	FUSE, 3A 500V [FA,2,3		
043-180	BURNER PILOT GAS REGULATOR FOR TOU		
048554	FUSE 4.5A 250V [F5,6]		
1/2-09-0027-30-K-WB1	THERMOCOUPLE 1/2-09-0027-30-K-WB1-1/4-27 FOR TOU		
[redacted]8	GAS BURNER TRAIN REGULATOR FOR TOU		
[redacted]31-01	Wet End Kit for Drain tank of the T.O.U.		
[redacted]	SIZE 1 MOTOR STARTER HEATER FOR TOU		
22	SIZE 2 MOTOR STARTER HEATER FOR TOU		
261277.14	FUSE,400A,[F11.12,13]		
316K-375-316-D-18-B2	THERMOCOUPLE FOR TOU		
316K-75-316-D-30-B2Y	THERMOCOUPLE FOR TOU		
3195CC4AAA20	PRESSURE TRANSDUCER FOR TOU		
871PH-1F1A	PH SENSOR FOR TOU		
ADA010-4AA2A0DAA	PRESTART PURGE DAMPER ACTUATOR FOR TOU		
P14H1405	DRAINAGE PUMP MOTOR FOR TOU		
SB035-4AA2A00AA	INLET ISOLATION VALVE ACTUATOR FOR TOU		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TOU-800-TOU	CHECK BURNERS, AND GREASE ALL VALVES.	PM		Yes		No

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	TOU-800-VDM	Valve Drive Motor- 5hp DC Motor	
Equipment Type		Person Responsible	
Serial No.	34-5990217901	Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No /Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TOU-800-VDM	VALVE DRIVE MOTOR-TOU	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	TOU-800-VFD	VAIRABILE FAN DRIVE ON THE TOU	
Equipment Type	TOU	Person Responsible	
Serial No.	8778-P	Location	THERMAL OXIDATION BUILDING
Model No.	DA-54RB1212-100	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	ROBBINSON	General Ledger No.	
Vendor ID	WCAS	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$221.44	User-defined Field 9	
Spare-parts Code	MEFB	User-defined Field 10	

Equipment Report (Full List)

Item No.	Description	Qty.	Site
.5773W/LER SEALS	MAIN EXHAUST FAN BEARING FLOAT (TOU)		

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TOU-800-VFD	GREASE BEARINGS	PM		Yes		No

Safety Note

TYPE-RB1212
SIZE-55
DRAWING NO. DA54RB1212-100

Nameplate Information

Equipment No.	TP-510	TERTIARY FILTER FEED PUMP	
Equipment Type	TP	Person Responsible	
Serial No.	772D301.1	Location	GROUND TREATMENT BUILDING
Model No.	3796	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	G/PUMPS	General Ledger No.
Vendor ID	G/PUMPS	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TP-510	TERTIARY PUMPS/OIL LEVELS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	TP-511	TERTIARY FILTER FEED PUMP	
Equipment Type	TF	Person Responsible	
Serial No.	772D301.2	Location	GROUND TREATMENT BUILDING
Model No.	3796	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	G/PUMPS	General Ledger No.
Vendor ID	G/PUMPS	Asset No.
Cost Center		Service Code
Department	OPRS	User-defined Field 1
Purchase Date		User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date		User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$0.00	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
TP-510	TERTIARY PUMPS/OIL LEVELS	PM		Yes		No

Safety Note

Nameplate Information

Equipment No.	VCR-TV-000	VCR/TV SERVICE CONTARCT	
Equipment Type		Person Responsible	
Serial No.	TRANS # 371101150521	Location	CONFRENCE ROOM
Model No.	PVC2060	Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	PAN	General Ledger No.
Vendor ID		Asset No.
Cost Center		Service Code
Department	LAB	User-defined Field 1
Purchase Date	11/17/00	User-defined Field 2
Startup Date		User-defined Field 3
Warranty Expiration Date	11/17/03	User-defined Field 4
Life (months)		User-defined Field 5
Original Cost		User-defined Field 6
Replacement Cost		User-defined Field 7
Labor Cost	$0.00	User-defined Field 8
Material Cost	$329.99	User-defined Field 9
Spare-parts Code		User-defined Field 10

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
VCR-TV-00	ANNUAL INSPECTION AND CLEANING		3.00	Yes		No

Safety Note

Nameplate Information

Equipment No.	VIB TEST-001	VIBRATION TEST PERFORMED ON MOTORS	
Equipment Type		Person Responsible	
Serial No.		Location	-
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer	WYLIE	General Ledger No.	
Vendor ID	WYLIE	Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
VIB TEST-OO1	VIBRATION TEST PERFORMED ON ALL MOTORS	PM	3.00	Yes		No

Safety Note

Nameplate Information

Equipment No.	VLD-1-S	VERTICAL LIFT DOOR SOUTH	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	VLD-2-S	VERTICAL LIFT DOOR SOUTH	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	VLD-3-S	VERTICAL LIFT DOOR SOUTH	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	VLD-4-W	VERTICAL LIFT DOOR WEST	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	VLD-5-W	VERTICAL LIFT DOOR WEST	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	VLD-6-W	VERTICAL LIFT DOOR WEST	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	VLD-N-1	VERTICAL LIFT DOOR NORTH	
Equipment Type		Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	VLD-S-2	VERTICAL LIFT DOOR SOUTH	
Equipment Type		Person Responsible	
Serial No.		Location	GROUND TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department	OTHER	User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	EW-10	EXTRACTION WELL	
Equipment Type	EW	Person Responsible	LC
Serial No.		Location	ON SITE-OFF SITE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No /Description

Safety Note

Nameplate Information

Equipment Report (Full List)

Equipment No.	EW-11	EXTRACTION WELL	
Equipment Type	EW	Person Responsible	LC
Serial No.		Location	ON SITE-OFF SITE
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Safety Note

Nameplate Information

Equipment No.	ACID WAGON	ACID WAGON-TO INJECT ACID INTO WELLS	
Equipment Type		Person Responsible	
Serial No.		Location	SLUDGE TREATMENT BUILDING
Model No.		Sub-location 1	-
Priority		Sub-location 2	-
Operating Status		Sub-location 3	-
In Service	Yes		

Manufacturer		General Ledger No.	
Vendor ID		Asset No.	
Cost Center		Service Code	
Department		User-defined Field 1	
Purchase Date		User-defined Field 2	
Startup Date		User-defined Field 3	
Warranty Expiration Date		User-defined Field 4	
Life (months)		User-defined Field 5	
Original Cost		User-defined Field 6	
Replacement Cost		User-defined Field 7	
Labor Cost	$0.00	User-defined Field 8	
Material Cost	$0.00	User-defined Field 9	
Spare-parts Code		User-defined Field 10	

Component Equipment No./Description

Equipment Report (Full List)

Task No.	Description	WO Type	Priority	In-service Task	Expense Class	Multitask
D WAGON	ACID INJECTION SYSTEM	CLEAN	3.00	Yes		No

Safety Note

THE INJECTION SYSTEM HAS A BRIGGS & STRATTON MOTOR WHICH OPERATES A STAINLESSS STEEL GRAR PUMP, AND GENERATOR PUTTING OUT 120V. AND A BOILER HEATER. YOU MUST BE DRESSED IN A TYVAC, BOOTS, GLOVES AND HARD HAT WITH A SAFTY SHEILD, WHEN INJECTING ACID INTO A WELL.

Nameplate Information

Task No. AC-751
Description DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. AC-751
Equipment Description AIR COMPRESSOR-AND MOTOR
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 6/03
Next Due Date 10/ 5/03
Tenant
Perform Every 60.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. AC-752
Equipment Description AIR COMPRESSOR-AND MOTOR
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 6/03
Next Due Date 10/ 5/03
Tenant
Perform Every 60.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
1222453	GEBERAL PNEUMATE AIR FILTER				Yes
2115929	AIR FILTER FOR GARDNER DENVER COMPRESSOR				Yes
26C28	OIL FILTER FOR GARDNER DENVER				Yes
AEON 500	AEON 500 OIL FOR DENVER COMPRESSOR				Yes

Task Instructions

Instruction Code AC-751 **Date Last Edited**

REFER TO FILE AC-751:MANUALLY DRAIN CONDENSATE TANK AND DRAIN FILTER HOUSING LOCATED AFTER AIR TANK: MONTHLY,1) Manually operate safety valves, wearing safty glasses, gloves and hearing protection. Check oil levels. 3rd MONTH, 1) Inspect and clean air inlet filter if necessary. 2) Inspect oil for contamination and change if necessary, or change yearly. 3) Clean cylinder cooling fins, aftercooler internally and externally. 4) Check belt tension of V-belt drive. 5) Lubricate inlet unloader pistion w/lubricant capable of 200F. 6) Tighten and inspect all bolts. 7) Inspect system for air leakes. Grease drive motor every 6th month. YEARLY, 1) Change oil.

Task No. AC-901
Description DRAIN WATER FROM TANK, CHECK OIL LEVELS, AND AIR FILTER
Assigned To
WO Type PM
Expense Class
Priority
Multitask Yes
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. -
Equipment Description

Location	-	Perform Every	30.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	14.00
Date Last Performed	11/10/03	Down Time	
Next Due Date	11/17/03	Must Be Down	No
Tenant			

Equipment No.	AC-901-1		
Equipment Description	AIR COMPRESSOR-AND MOTOR		
Location	GROUND TREATMENT	Perform Every	30.00 Day(s)
Sub-location 1	BUILDING	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	22.00
Date Last Performed	11/10/03	Down Time	
Next Due Date	11/17/03	Must Be Down	No
Tenant			

Equipment No.	AC-901-2		
Equipment Description	INGERSOLL/AIR COMPRESSOR-AND MOTOR		
Location	GROUND TREATMENT	Perform Every	30.00 Day(s)
Sub-location 1	BUILDING	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	22.00
Date Last Performed	11/10/03	Down Time	
Next Due Date	11/17/03	Must Be Down	No
Tenant			

Equipment No.	AC-902-1		
Equipment Description	AIR COMPRESSOR AND MOTOR		
Location	BLOWER BUILDING	Perform Every	30.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	22.00
Date Last Performed	11/10/03	Down Time	
Next Due Date	11/17/03	Must Be Down	No
Tenant			

Equipment No.	AC-902-2		
Equipment Description	INGERSOLL/AIR COMPRESSOR AND MOTOR		
Location	BLOWER BUILDING	Perform Every	30.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	22.00
Date Last Performed	11/10/03	Down Time	
Next Due Date	11/17/03	Must Be Down	No
Tenant			

Equipment No.	AC-903-1		
Equipment Description	AIR COMPRESSOR AND MOTOR		
Location	BLOWER BUILDING	Perform Every	30.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	22.00
Date Last Performed	11/10/03	Down Time	
Next Due Date	11/17/03	Must Be Down	No
Tenant			

Equipment No.	AC-903-2		
Equipment Description	INGERSOLL/AIRCOMPRESSOR AND MOTOR		
Location	BLOWER BUILDING	Perform Every	30.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed

Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 11/17/03
Tenant

Task Duration
No. of Times Completed 22.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
32012957	AIR FILTERS FOR INGERSOIL RAND COMPRESSORS				Yes
39474788	WATER MIST ELEMENT FOR INGERSOLL- RAND COMPRESSOR				Yes
500	AEON 500 OIL				Yes

Task Instructions

Instruction Code AC-901

Date Last Edited

REFER TO FILE AC-901: MANUALLY DRAIN CONDENSATE TANK AND DRAIN FILTER HOUSING LOCATED AFTER AIR TANK: 1) Inspect and clean air inlet filter if necessary. Change air filter yearly if needed. 2) Inspect oil for contamination and change if necessary, or change yearly, These units holds 4.5 qts. 3) Manually operate safety valves. 4) Clean cylinder coolling fins. 5) Check belt tension of V-belt drive. 6) Lubricate inlet unloader pistion w/lubricant capable of 200F. 7) Tighten and inspect all bolts. 8) Inspect system for air leakes. 9) Check operation of low level oil switch. Every 6th month add 4 shots of grease to drive motor.

Task No. ADS-000
Description Air Distribution Screens
Assigned To
WO Type
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. ADS-000
Equipment Description Air Distrubation Screens
Location ALL BUILDINGS
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/12/03
Next Due Date 10/10/03
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code ADS-000

Date Last Edited

Clean all the Distrubation Screens On the GTB and TOU Blds.

Task No. ASB-220
Description ACTIVATED SLUDGE BLOWER AND MOTOR
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. ASB-220

Equipment Description ACTIVATED SLUDGE BLOWER AND MOTOR
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/28/03
Next Due Date 11/25/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. ASB-221
Equipment Description ACTIVATED SLUDGE BLOWER AND MOTOR
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/28/03
Next Due Date 11/25/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. ASB-222
Equipment Description ACTIVATED SLUDGE BLOWER AND MOTOR
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/28/03
Next Due Date 11/25/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code ASB-220 **Date Last Edited** 3/17/03

REFER TO BOOK ASB-220: (MONTHLY): ALTERNATE BLOWER RUNNNG. (QUARTERLY): 1) Check out the control system per procedure in instruction manual. 2) Check the inlet valve calibration. 3) Visually inspect the inlet air filter elements. Clean or replace as necessary. 4) Visually inspect the oil mist arrestor. Clean the housing and replace the element if saturated.
(ANNUAL): 1) Inspect the main driver per manufactures instructions. 2) Visually inspect the coupling, lubricte if necessary. 3) Take an oil sample and analyze against IR specifications. 4) Rotate the bullgear and feel for roughness. 5) Inspect and clean the oil cooler tubes, clean the shell and tube side of the cooler as necessary. 7) Calibrate the controls and protective divices. 8) Visually inspect the inlet throttle and bypass valves.
In the spring, order new air intake filters, from Air Filter & Equipment, 3607 Gembrit Circle P.O. Box 3397 Kalamazoo MI. 49003 Phone: 1-800-548-4137, part no. A2424015-15I Filter information is 23-3/8 x 23-3/8 x 1-1/2 10 micron. The filters are of paper and needs replacing each spring. Can not clean and re-use.

Task No. AUH-981
Description GREASE UNIT, CHANGE AIR FILTER, AND CHECK DRIVE BELT
Assigned To
WO Type PM
Expense Class

Priority
Multitask Yes
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. AHU-981
Equipment Description AIR HANDLING UNIT AND MOTOR-OFFICE
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 23.00

Date Last Performed 11/10/03
Next Due Date 12/10/03
Tenant
Down Time
Must Be Down No

Equipment No. AHU-982
Equipment Description AIR HANDLING UNIT AND MOTOR-LAB
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 12/10/03
Tenant
Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 23.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
AIR FILTER	AIR FILTER FOR THE AUH UNITS 20X16X2				Yes
P51-038-A38	DRIVE BELT FOR AHU				Yes
SAE 20	HIGH GRADE MINERAL OIL SAE 20				Yes

Task Instructions

Instruction Code AUH-981
Date Last Edited

REFER TO FILE AHU-981: EACH UNIT HAS 2 GREASE ZERTS, AND SHOULD BE GREASED MONTHLY. CHECK AND CHANGE AIR FILTERS EVERY 6TH MONTHS.CHECK DRIVE BELT, AND TIGHTEN IF NEEDED. ALSO CHECK OIL LEVEL ON SEAL BEARINGS.

Task No. C-201
Description CLARIFIER UNITS
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. C-201
Equipment Description CLAIRIFIER INSIDE PCT 201
Location PCT-201
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/ 3/03
Next Due Date 9/19/03
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. C-202
Equipment Description CLAIRIFIER INSIDE PCT 202
Location PCT-202
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/ 3/03
Next Due Date 9/19/03
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. C-301
Equipment Description CLARIFIER OUTSIDE (301)
Location OUTSIDE
Sub-location 1 -
Perform Every 180.0 Day(s)
Schedule Type Fixed

Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	5.00
Date Last Performed	6/ 3/03	Down Time	
Next Due Date	9/19/03	Must Be Down	No
Tenant			

Equipment No.	C-302		
Equipment Description	CLARIFIER OUTSIDE (302)		
Location	OUTSIDE	Perform Every	180.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	4.00
Date Last Performed	6/ 3/03	Down Time	
Next Due Date	9/19/03	Must Be Down	No
Tenant			

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
680 OIL	TEXACO 680 OIL FOR CLAIFIERS				Yes

Task Instructions

Instruction Code C-201 **Date Last Edited** 7/29/03

REFER TO BOOK C-201: (QUARTERLY)
1) Remove the rain cover from the worm gearbox and apply 2 shots of grease to the grease zerts.
2) Check for any accumulated water in the gearbox and drain if necessary.

(ANNUAL) 1) Change oil in gearbox using Texaco oil 680.

SCUM PUMP FOR CLARIFIERS: Check oil levels in pump. Remove any water around oil fill, then fill to 1/8" over motor plate through opening.
Use oil fill tube that will go into holes so that air can escape. Use only high grade transformer oil or special hydromatic submersible oil in motor.

Task No.	CAT GENERATOR		
Description	LP GAS POWERED GENERATOR SYSTEM CC1 & CC2		
Assigned To	LC	Priority	3.00
WO Type	PM	Multitask	Yes
Expense Class		In-service Task	Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No.	GENERATOR - 1		
Equipment Description	LP GAS POWEERED GENERATOR SYSTEM- CC1		
Location	TOP OF CREEK BED	Perform Every	30.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	13.00
Date Last Performed	10/27/03	Down Time	
Next Due Date	11/23/03	Must Be Down	No
Tenant			

Equipment No.	GENERATOR - 2		
Equipment Description	LP GAS POWERED GENERATOR SYSTEM-CC2		
Location	ON RIVER RD	Perform Every	30.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	13.00
Date Last Performed	10/27/03	Down Time	
Next Due Date	11/23/03	Must Be Down	No
Tenant			

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code LP GENER **Date Last Edited** 5/30/01

REFERE TO BOOK; CAT LP GAS POWERED GENERATOR SYSTEM:

Pre-start up Check list:
1. Ensure the control switch/key switch is in the "Auto" position. Note: This generator does not have an auto start control, and will not start by itself.
2. Check the engine oil and coolant levels. WARNING: Do not remove the radiator cap when the coolant is hot.
3. Check the fuel levels. WARNING: Do not smoke or use open flame in the vicinity of gas supply.
4. Check the condition and tension of the fan and engine alternator belts.
5. Check all hoses for loose connections or deterioration.
6. Check the battery terminals for corrosion.
7. Check the control panel and the generator for heavy accumulation of dust and dirt.
8. Check the air filter restriction indicator.
9. Clear the area around the generator of debris.
10. Regularly check the entire generator set for signs of leaks from the gas, cooling, and lubrication system.
11. Ensure the alternator out put circuit breaker is in the "off" (handle down) position.

Note: When starting up the generators, we must start the generator located at River & Central first. The communication system travels from Control Cabinet (CC) 1 through CC 2, then to the plant. When the power is shut off at CC2, the wells tied into CC1 will also shut down. Once the power is restored at CC2 control cabinet the communication system is back on'line. The wells located at CC1 can then be started.

Start Up:

At the computer located in the control room, shut down the wells that correspond to each generator, (CC1, wells 1-3, CC2, wells 4-7).
At the disconnect located on the side of the control cabinet, pull the lever from "Utilities" to the "Off" position.

When starting the generator be sure all faults have been corrected prior to starting and the emergency stop button is in the released position. Turn the control switch to "Run". The engine will crank up to three times or until engine fires. Check for any abnormal noises or vibrations. Check for fluid leakage or exhaust leakage. Check control panel for normal operation. The oil pressure should be in the range of 60 psi, and water running about 180F. Check the control panel for Voltage out put; no load running should be app. 50 to 52 Hz., and running with a load should be 60 to 62 Hz.

Switch alternator out put breaker to "On" handle up, then at the CC Cabinet, switch disconnect into "Generator". This sends power from the generator to the CC cabinet.

Back in the control room, the wells are ready to be restarted.

To shut down the generator, reverse steps of starting. Be sure to run the generator unloaded for about 10 minutes. For cool down, before turning the generator into the "Off" position.

Task No. CLARKLIFT-0
Description CLARKLIFT TO PERFORM MAINTENANCE ON FORKLIFT
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. CLARKLIFT
Equipment Description FORKLIFT MAINTENANCE
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration

Sub-location 3 -
Date Last Performed 10/22/03
Next Due Date 3/27/04
Tenant

No. of Times Completed 5.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
1802152	MOTOR OIL-FORKLIFT				Yes
918648	OIL FILTER FOR FORKLIFT				Yes

Task Instructions

Instruction Code CLARKLIFT-0 **Date Last Edited**

CLARKLIFT WILL COME ON SITE AND PERFORM P.M. ON FORKLIFT. POINTS OF INSPACTION INCLUDE: ENGINE, FUEL SYSTEM, IGNITION SYSTEM, ELECTRICAL SYSTEM, COOLING SYSTEM, TRANSMISSION/DIFFERENTIAL, BRAKE SYSTEM, STEERING SYSTEM, DRIVE AXLE AND TIRES, HYDRAULIC SYSTEM, UPRIGHT, CLEAN AND LUBRICATE, SAFETY ITEMS, PERIODIC SERVECE.
The P.M. on this unit has been set up for every 6th Month. The office no. 616-956-5030 for setting up P.M.

Task No. CMP-851
Description CAUSTIC FEED PUMP-TOU
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. CMP-851
Equipment Description CAUSTIC FEED PUMP IN TOU BUILDING
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/ 4/03
Next Due Date 2/21/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
U-26142	P.M. PUMP REPAIR KIT FOR ONE HEAD				No
U18443 W&T	W&T OIL U18443 FOR CAUSTIC FEED PUMP				No

Task Instructions

Instruction Code CMP-851 **Date Last Edited**

REFER TO BOOK, PAP-630 1) Replace diaphragm, check balls, ball guides, seats, o-rings and seatings springs if used. 2) Replace wearing parts of optional main connection(U22937 or U21831or U24489 if used). 3) Maintain oil level at line on resevoir dipstick. Use part number W&T U18443 for replacement oil.

Task No. CONCAB
Description INSPECTION FOR FILTERS
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FILTERS
Equipment Description CONTROL CABINENTS
Location ON SITE-OFF SITE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 7/03
Next Due Date 9/10/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 10.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code CONCAB

Date Last Edited

Inspect all of the following filters at the following cabinets and MCC's for debris accumulation. Clean filter if possible
replace if needed. There are two filters on each of the cabinents in the buildings-one on top-silver mesh filter, one
below-woven mesh. Silver mesh may need to be cleaned with a degreaser, all other may be carefully cleaned by using compressed
air on a low setting.

_____ NW Corner of Blower Building

_____ East Wall of Electrical Room(CC-3)

_____ South East corner of STB

_____ At River and Central (CC-2)

_____ Next to EW-3 (CC-1)

_____ MCC cabinet in STB

_____ MCC cabinet in GTB

_____ MCC cabinet in BB

Task No. CS-665
Description CARBON SILO
Assigned To
WO Type PM
Expense Class

Priority 3.00
Multitask Yes
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. CS-665
Equipment Description CARBON SILO
Location CARBON SILO
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/27/03
Next Due Date 7/27/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No. CST-663
Equipment Description CARBON SLURRY TANK

Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/27/03
Next Due Date 7/27/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No. CST-666
Equipment Description CARBON SILO FEEDER
Location CARBON SILO
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/27/03
Next Due Date 7/27/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No. CST-670
Equipment Description CARBON FEED PUMP/WILDEN,M8 EAST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/27/03
Next Due Date 7/27/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No. CST-671
Equipment Description CARBON FEED PUMP/WILDEN, M8 WEST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 6/27/03
Next Due Date 7/27/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. DB-120
Description DIFFUSED AIR BLOWERS
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. DB-120
Equipment Description DIFFUSED AIR BLOWERS
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/28/03
Next Due Date 11/25/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. DB-121
Equipment Description DIFFUSED AIR BLOWERS

Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/28/03
Next Due Date 11/25/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. DB-122
Equipment Description DIFFUSED AIR BLOWERS
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/28/03
Next Due Date 11/25/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code DB-120 **Date Last Edited**

REFER TO BOOK ASB-220: (MONTHLY): ALTERNATE BLOWER RUNNNG. (QUARTERLY): 1) Check out the control system per procedure in instruction manual. 2) Check the inlet valve calibration. 3) Visually inspect the inlet air filter elements. Clean or replace as necessary. 4) Visually inspect the oil mist arrestor. Clean the housing and replace the element if saturated.
(ANNUAL): 1) Inspect the main driver per manufactures instructions. 2) Visually inspect the coupling, lubricte if necessary. 3) Take an oil sample and analyze against IR specifications. 4) Rotate the bullgear and feel for roughness. 5) Inspect and clean the oil cooler tubes, clean the shell and tube side of the cooler as necessary. 7) Calibrate the controls and protective divices. 8) Visually inspect the inlet throttle and bypass valves.

Task No. DF-130
Description BY PASS FANS
Assigned To
WO Type PM
Expense Class

Priority
Multitask Yes
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. DF-130
Equipment Description BY PASS FANS
Location OUTSIDE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/14/02
Next Due Date 11/14/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. DF-131
Equipment Description BY PASS FANS
Location OUTSIDE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/14/02
Next Due Date 11/14/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. DF-132

Equipment Description BY PASS FANS
Location OUTSIDE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/14/02
Next Due Date 11/14/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
15-000	V-BELTS				Yes
2&6	WHEEL AND SHAFT ASSEMBLY				Yes
7	BEARINGS				Yes

Task Instructions

Instruction Code DF-130 **Date Last Edited**

REFER TO FILE DF-130: MONTHLY: fan bearings should be inspected for proper lubrication, using the "RED" lithium grease.
BI-ANNUAL, 1) Check fan bearing, motor and v-belt alignment, 2) Check belts for wear and tension, replace in matched sets if necessary. 3) Check all bolts for tightness. 4) Inspect fan and housing for wear and dirt accumulation. Clean if necessary with steam or water jet. 5) Check exterior surfaces for rust and exposed metal, re-paint as needed.

Task No. DP-540
Description DISCHARGE PUMP (EFFLUENT)
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. DP-540
Equipment Description DISCHARGE PUMP (EFFLUENT)
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/26/03
Next Due Date 12/10/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 8.00
Down Time
Must Be Down No

Equipment No. DP-541
Equipment Description DISCHARGE PUMP (EFFLUENT)
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/26/03
Next Due Date 12/10/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 8.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At
DP-540	hour	5,152.00
DP-541	hour	9,243.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
HD-68	TEXACO RANDO HD68				Yes

Task Instructions

Instruction Code DP-540 **Date Last Edited** 7/12/00

FEFER TO FILE DP PUMPS: MONTHLY; ALTERNATE PUMP RUNNING, Also check and tighten packing gland as needed to stop leakage. Remember, some water leakage is needed to keep packing lubercated.
QUARTERLY: Change pump oil every 4000 hours or Quarterly, using Texaco Rando HD68. Grease motor every 4000 Hours. Be sure to remove the fill plug when adding grease.

Task No. DRUM PUMP-1
Description CHEMICAL DRUM PUMP
Assigned To
WO Type
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. DRUM PUMP-1
Equipment Description CHEMICAL DRUM PUMP
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 10/20/03
Next Due Date 4/ 8/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
J/16403-0010	Drum pump, Bearing Housing				Yes
J/16503-0001	Drum pump, Discharge Port				Yes
J/18753-0316	Drum pump, Kit Shaft & BRG.				Yes
J/18753-0445	Drum pump, Coupling drive				Yes
J/91701-4434	Drum pump, O-Ring				Yes

Task Instructions

Instruction Code DRUM PUMP-1 **Date Last Edited**

Make a visual inspection of the pump, electrial cord, shut off switch, and any damage to the shaft. And test the pump by pumping water from a pail.

Task No. EF-951
Description EXHAUST FANS FOR BUILDINGS
Assigned To
WO Type PM
Expense Class
Priority
Multitask Yes
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EF-951
Equipment Description EXHAUST FAN-NORTH WALL
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration

Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-952 A-B
Equipment Description EXHAUST FAN ON NORTH WALL
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-953-A
Equipment Description EXHAUST FAN ON NORTH EAST MEZZ
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-953-B
Equipment Description EXHAUST FAN ON WEST MEZZ
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-955
Equipment Description EXHAUST FAN E. MEZZANINE
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-956
Equipment Description FRESH AIR FEED TO ELETRICAL ROOM E. MEZZ
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-957-A
Equipment Description EXHAUST FAN IN BLOWER BLD. WEST
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time

Next Due Date 2/26/04
Tenant
Must Be Down No

Equipment No. EF-957-B
Equipment Description EXHAUST FAN IN BLOWER BLD. WEST
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-958
Equipment Description EXHAUST FAN-PUMPING BLD.
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-959
Equipment Description EXHAUST FAN - LAB HOOD
Location GROUND TREATMENT BUILDING
Sub-location 1 WEST MEZZANINE
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-980
Equipment Description EXHAUST FAN TO REST-ROOM
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-981-A
Equipment Description EXHAUST FAN FOR T.O.U. BUILDING
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. EF-981-B
Equipment Description EXHAUST FAN/TOU CONTROL ROOM
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 2/26/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
07E12	EA12- Actuator Barber Colman				Yes
2330	DRIVE BELT FOR RESTROOM: 1/2"X33" from Quality				Yes
2380	DRIVE BELT FOR LAB HOOD/ 1/2" X 38" from Quality				Yes
2440	DRIVE BELT FOR LAB AHU-982;1/2"X44" from Quality				Yes
UNKNOW AT THIS TIME.	DRIVE BELT FOR OFFICES: 1/2"X38"				Yes
UNKNOWN	DRIVE BELT FOR SCRUBBER T.O.U. 1/2 X 44"				Yes

Task Instructions

Instruction Code EF-951 **Date Last Edited**

Most of the motors have sealed bearings and need no maintenance. There are a few motors and fans that have grease zerts which needs to be greased yearly.
Make a visual inspection of the fans and of the air intake louvers.
EXHAUST FAN-LAB HOOD: This unit should be greased every other month. Alos check the heater unit which supplies fresh air to the hood. In the winter months, set the temp. around 65 to 70* and in the summer months the heater unit can be turned off. Alos check belts for wear.
BB EXHAUST: Every 6th month the louvers (ends) should be sprayed with w-d40.
T.O.U. EXHAUST: These unit both have grease zerts and should be greased once in the spring and in the fall. Check belts for tention, and wear. Belt replacement for scrubber area is 1/2" x 44". AIR INTAKE, AND AIR EXHAUST FANS TO ELETRICAL ROOM. These fans have two grease zerts on each fan and needs greasing in the fall and spring.

Task No. EL-000
Description EMERGENCY LIGHTING
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EL-000
Equipment Description EMERGENCY LIGHTING
Location IN ALL BUILDINGS
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/19/03
Next Due Date 8/29/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. EL-001
Equipment Description EMERGENCY LIGHTING
Location GROUND TREATMENT BUILDING
Sub-location 1 BLOWER BUILDING
Sub-location 2 SLUDGE TREATMENT BUILDING
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 8/29/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code EL-000 **Date Last Edited**

The emergency lighting can be tested by shutting off the power to the units, or by depressing the test button on each unit.
For the yearly testing the power should be shut off to the lights, letting the emergency light to stay on till the battery is dead and need to be fully recharged.

Task No. ELETC. SWITCH
Description CHANGE OUT FILTERS WITH 20 X20 X 1
Assigned To
WO Type PM
Expense Class
Priority 3.00
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. ELETC. SWITCH CABINET
Equipment Description CHANGE AIR FILTERS 20 X 20 X 1
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 4/14/03
Next Due Date 4/13/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 2.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
AIR FILTERS	AIR FILTERS SIZE 20 X 20 X 1				Yes

Task Instructions

Instruction Code ELETRICAL **Date Last Edited** 2/20/01

THERE ARE A TOTAL OF 26 FILTERS NEEDED TO CHANGE OUT ALL THE ELETRICAL CABINETS, IN THE BLOWER BLD. STB BLD. AND ELETRICAL ROOM. THE SIZE OF THE FILTERS ARE 20 X20 X 1, CAN BE BOUGHT AT MEIJERS.

Task No. ESH-000
Description ELETRICAL SWITCH HOUSE- CLEAN FLOORS
Assigned To
WO Type CLEAN
Expense Class
Priority 3.00
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. ESH-000
Equipment Description ELETRICAL SWITCH HOUSE
Location ON SITE GROUNDS
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 4/15/03
Next Due Date 9/29/03
Tenant
Perform Every 6.00 Month(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 5.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code ESH-000 **Date Last Edited** 9/29/0

PERFORM GENERAL CLEANING OF FLOORS. SWEEP AND MOP IF NEEDED.

Task No. ET-983
Description FRESH AIR INTAKE INTO LAB
Assigned To **Priority**
WO Type PM **Multitask** No
Expense Class **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. ET-983
Equipment Description FRESH AIR INTAKE INTO LAB
Location GROUND TREATMENT **Perform Every** 180.0 Day(s)
Sub-location 1 BUILDING **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 6.00
Date Last Performed 11/10/03 **Down Time**
Next Due Date 2/ 5/04 **Must Be Down** No
Tenant

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
00000	DUST COLLECTOR FILTER BAGS				Yes

Task Instructions

Instruction Code ET-983 **Date Last Edited**

This unit is located on the mezzanine in the ground treatment building. This unit has 2 grease zerts, and a air filter that need changing.

Task No. EW-1-4
Description AMP READINGS ON THE THREE LEAD WIRES TO MOTOR
Assigned To **Priority**
WO Type PM **Multitask** Yes
Expense Class **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EW-1
Equipment Description EXTRACTION WELL 1
Location TOP OF CREEK BED **Perform Every** 30.00 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 26.00
Date Last Performed 10/21/03 **Down Time**
Next Due Date 11/17/03 **Must Be Down** No
Tenant

Equipment No. EW-2
Equipment Description EXTRACTION WELL 2
Location TOP OF CREEK BED **Perform Every** 30.00 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 26.00
Date Last Performed 10/21/03 **Down Time**
Next Due Date 11/17/03 **Must Be Down** No
Tenant

Equipment No. EW-3

Equipment Description EXTRACTION WELL 3
Location TOP OF CREEK BED
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 10/21/03
Next Due Date 11/17/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 26.00
Down Time
Must Be Down No

Equipment No. EW-4
Equipment Description EXTRACTION WELL 4
Location ON RIVER RD
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 10/21/03
Next Due Date 11/17/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 26.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code EW-1-4 **Date Last Edited**

USING THE CLIP ON AMP METER, READ THE AMPS DRAWN ON THE THREE LEAD WIRES FEEDING THE MOTOR. READING ONE WIRE AT A TIME. RECORD AMP READING ON BENCH SHEET.

Task No. EW-2
Description EXTRACTION WELL 2
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EW-2
Equipment Description EXTRACTION WELL 2
Location TOP OF CREEK BED
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant

Perform Every Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. EW-3
Description EXTRACTION WELL 3
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EW-3
Equipment Description EXTRACTION WELL 3
Location TOP OF CREEK BED
Sub-location 1 -
Sub-location 2 -

Perform Every Day(s)
Schedule Type Fixed
Task Duration

Sub-location 3 -
Date Last Performed
Next Due Date
Tenant
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. EW-4
Description EXTRACTION WELL 4
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EW-4
Equipment Description EXTRACTION WELL 4
Location ON RIVER RD
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant
Perform Every Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. EW-5
Description EXTRACTION WELL 5
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EW-5
Equipment Description EXTRACTION WELL 5
Location ON RIVER RD
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant
Perform Every Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. EW-6
Description EXTRACTION WELL 6
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EW-6
Equipment Description EXTRACTION WELL 6

Location: ON RIVER RD
Sub-location 1: -
Sub-location 2: -
Sub-location 3: -
Date Last Performed:
Next Due Date:
Tenant:
Perform Every: Day(s)
Schedule Type: Fixed
Task Duration:
No. of Times Completed:
Down Time:
Must Be Down: No

Equipment No.	Meter Name	Last Performed At

Task No.: EW-7
Description: EXTRACTION WELL 7
Assigned To:
WO Type: PM
Expense Class:
Priority:
Multitask: No
In-service Task: Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No.: EW-7
Equipment Description: EXTRACTION WELL 7
Location: ON RIVER RD
Sub-location 1: -
Sub-location 2: -
Sub-location 3: -
Date Last Performed:
Next Due Date:
Tenant:
Perform Every: Day(s)
Schedule Type: Fixed
Task Duration:
No. of Times Completed:
Down Time:
Must Be Down: No

Equipment No.	Meter Name	Last Performed At

Task No.: EW-8
Description: EXTRACTION WELL 8
Assigned To:
WO Type: PM
Expense Class:
Priority:
Multitask: No
In-service Task: Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No.: EW-8
Equipment Description: EXTRACTION WELL 8
Location: ON SITE GROUNDS
Sub-location 1: -
Sub-location 2: -
Sub-location 3: -
Date Last Performed:
Next Due Date:
Tenant:
Perform Every: Day(s)
Schedule Type: Fixed
Task Duration:
No. of Times Completed:
Down Time:
Must Be Down: No

Equipment No.	Meter Name	Last Performed At

Task No.: EW-9
Description: EXTRACTION WELL 9
Assigned To:
WO Type: PM
Expense Class:
Priority:
Multitask: No
In-service Task: Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. EW-9
Equipment Description EXTRACTION WELL 9
Location ON SITE GROUNDS
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant

Perform Every Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. FCP-000
Description FERRIC LEAK, AT MIXER. CHANGE RAG
Assigned To
WO Type
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FCP-000
Equipment Description FERRIC LEAK AT MIXER. CHANGE RAG
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/13/03
Next Due Date 1/29/04
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 24.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code FCP-000 **Date Last Edited** 11/ 1/00

Check and replace rag if needed to keep ferric from spilling down to the ground. This is a two man operation.

Task No. FCP-600
Description FERRIC CHLORIDE PUMP - 1
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FCP-600
Equipment Description FERRIC CHLORIDE PUMP 1
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 10/20/03
Next Due Date 1/ 7/04
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. FCP-601
Equipment Description FERRIC CHLORIDE PUMP 2

Location GROUND TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 10/20/03
Next Due Date 1/ 7/04
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At
FCP-600	HOUR	6,973.00
FCP-601	HOUR	8,325.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
U-26142	P.M. PUMP REPAIR KIT FOR ONE HEAD				Yes
U18443 W&T	W&T OIL U18443 FOR CAUSTIC FEED PUMP				Yes

Task Instructions

Instruction Code FCP-600 **Date Last Edited** 8/ 7/01

REFER TO BOOK, PAP-630 1) Replace diaphragm, check balls, ball guides, seats, o-rings and seatings springs if used. 2) Replace wearing parts of optional main connection(U22937 or U21831or U24489 if used). 3) Maintain oil level at line on resevoir dipstick. Oil used in the pumps are a 90W oil.
For Parts and Service Contact: R & S Technical, 13684 Beckwith Dr. Lowell MI. 49331
Phone: 616-897-7041

Task No. FFP-710
Description FILTER-PRESS FEED PUMP - BY ABLE
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FFP-710
Equipment Description FILTERPRESS FEED PUMP
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/26/03
Next Due Date 11/17/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 13.00
Down Time
Must Be Down No

Equipment No. FFP-711
Equipment Description FILTERPRESS FEED PUMP
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/26/03
Next Due Date 11/17/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 12.00
Down Time
Must Be Down No

Equipment No. FFP-712
Equipment Description FILTERPRESS FEED PUMP
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -

Perform Every 90.00 Day(s)
Schedule Type Fixed

Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/26/03
Next Due Date 11/17/03
Tenant

Task Duration
No. of Times Completed 13.00
Down Time
Must Be Down No

Equipment No. FFP-713
Equipment Description FILTERPRESS FEED PUMP
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/21/03
Next Due Date 11/17/03
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 12.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At
FFP-710	hour	428.00
FFP-711	hour	313.00
FFP-712	hour	395.00
FFP-713	METER	259.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
HD-68	TEXACO RANDO HD68				Yes

Task Instructions

Instruction Code FFP-710 **Date Last Edited**

REFERE TO BOOK FP-710: MONTHLY; 1) check the oil level in the gearbox.Filling level, top edge of the oil sight gauge. 2) Check the hydraulic fluid level in the hydraulic resevoir tank. If necessary add more up to the overflow. 3) Check the stuffing box packing. In case of leakage tighten packing gland with a wring wrench unitl a thin film of moisture is visble on the piston rod. 4) Open the drain valve below the pulsation dampener periodically for ventilation and completely empty the pulsation dampener. At the same time make sure that the pulsation dampener can draw air. 5) Check bleed ports function when the pump is running. During each pressure stroke, hydraulic fluid must be forced from the hydraulic side into the hydraulic reservoir tank. If necessary remove and clean bleed ports. 6) Check the function of the central pressure regulating valve.7) After 1.5 years changer the oil in gear box,oil Texace HD 68. After 2 years change the hydraulic fluid.

Task No. FFP-721
Description FILTER PRESS
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FP-721
Equipment Description FILTER PRESS
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/13/03
Next Due Date 1/ 4/04
Tenant

Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. FP-722
Equipment Description FILTER PRESS
Location SLUDGE TREATMENT BUILDING

Perform Every 90.00 Day(s)

Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	11.00
Date Last Performed	10/ 1/03	Down Time	
Next Due Date	1/ 3/04	Must Be Down	No
Tenant			

Equipment No.	FP-723		
Equipment Description	FILTER PRESS		
Location	SLUDGE TREATMENT BUILDING	Perform Every	90.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	11.00
Date Last Performed	11/10/03	Down Time	
Next Due Date	1/ 3/04	Must Be Down	No
Tenant			

Equipment No.	Meter Name	Last Performed At
FP-721	hour	468.00
FP-722	hour	605.00
FP-723	hour	327.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
CP-10143008	GASKET MATAL FOR FILTER PRESS PLATES				Yes
CP-751-531--937	CASING RING O-RING				Yes
CP-751-531-264	STUFF BOX O-RING				Yes
CP-751-531-428	SLEEVE O RING FOR PRESS WASH PUMP				Yes
CP-753-030-535	GREASE SEAL FOR FILTER WASH PUMP				Yes
CP-811-443-227	BEARING(OUTB)				Yes
CP-819-111-206	LOCKNUT, BRG FOR FILTER PRESS WASH PUMP				Yes
CP-819-133-206	LOCKWASHER, BRG FOR FFILTER WASH PUMP				Yes

Task Instructions

Instruction Code FFP-721 **Date Last Edited**

REFER TO BOOK FFP-721: [FOLLOWER] QUARTERLY Grease the 4 follower wheels, and the Clevis fittings.[Cylinder Boot] WEEKLY, Inspect boot for tears or holes. Repair/replace if damaged. NOTE! It is important that the boot maintains a seal around the cylinder rod since certain processes may caause quick deterioration of the cylinder rod. Repair or replacemfent of the cylinder would be quite expensive. [HYDRAULIC POWER UNIT] 1) clamp presssure, DAILY check for correct clamp pressure. 2) Relief Valve, QUARTERLY check for proper setting. 3) Oil Level, check WEEKLY for proper level. 4) Oil Filter, MONTHLY inspect and /or clean. 5) Oil Filter, YEARLY replace. 6) Hydraulic Oil replace YEARLY. [CLOTH WASH SYSTEM] 1) Spray nozzles, EACH USE check pattern for blockage or non-uniform pattern. 2) Chain Drives, MONTHLY inspect and lubrcate as needed. 3) Hose connections and fittings, MONTHLY inspect for leaks. 4) Brush Assembly, QUARTERLY inspect for wear.5) Main Drive Shaft Bearings, QUARTERLY lubricate with #2 grease. 6) Gear Box Drives, QUARTERLY heck oil levels. 7) Gear Box Drives, YEARLY replace oil with AGMA 8EP type. [DRIP TRAY]) Cylinder connections, QUARTERLY inspect joints for wear. 2) Bearings, QUARTERLY grease.

[PLATE SHIFTER] 1) Chain, WEEKLY inspect and lubricate with light weight oil as needed. 2) Latches, AS NEEDED if more than one plate shifts, inspect latch for free motion, lubricate with light weight oil if needed. 3) Plate Hanger Roller, QUARTERLY instect for smooth motion and wear. Replace as needed. 4) Shifter Pawls (tabs that grab and shift the

plates) MONTHLY inspect for smooth operation. 5) Sprocket bearings, QUARTELY lubricate using #2 greasse.
FOR A LISTING OF SPARE PARTS, REDER TO JWI OPERATION MANUL UNDER SPARE PARTS.

Task No. FIT-221
Description FLOW TRANSMITTER
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. -
Equipment Description
Location -
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant
Perform Every Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No. FIT-00-LIC-635
Equipment Description LIQUID LEVEL TANSMITTER-PHOSPHORIC ACID
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. FIT-00-LIT-401
Equipment Description LIQUID LEVEL TRANSMITTER-TERTIRAY TANK
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. FIT-00-LIT-531
Equipment Description LIQUID LEVEL TRANSMITTER-EFFLUENT TANK
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. FIT-00-LTC-602
Equipment Description LIQUID LEVEL TRANSITTER-FERRIC TANK
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. FIT-221

Equipment Description FLOW TRANSMITTER
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 8/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FIT-222
Equipment Description FLOW TRANSMITTR
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FIT-524
Equipment Description FLOW TRANSMITTER BY-PASS FILTERS
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FIT-551
Equipment Description FLOW TRANSMITTER TO S. GAC
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FIT-552
Equipment Description FLOW TRANSMITTER TO N. GAC
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FIT321
Equipment Description FLOW TRANSMITTER
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 10/ 1/03
Next Due Date 7/31/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 5.00
Down Time
Must Be Down No

Equipment No. FIT322
Equipment Description FLOW TRANSMITTER
Location SLUDGE PUMP HOUSE
Perform Every 365.0 Day(s)

Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/10/03
Next Due Date 7/31/04
Tenant

Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code FIT-221 **Date Last Edited** 8/22/00
REFER TO BOOK FIT-221 FLOW METERS; THESE FLOW METERS HAVE NO MOVING PARTS AND REQUIRE LITTLE MAINTENANCE. BUT CALIBRATIION ADJUSTMENTS MUST BE CHECKED EVERY-YEAR. THIS MUST BE DONE M.D. INSTURMENTS.

Task No. FIT-561
Description FINAL FLOW RECORDER STRIP CHART
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FIT-561
Equipment Description FINAL FLOW RECORDER STRIP CHART
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 8/03
Next Due Date 11/20/03
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
G	RTD TRANSMITTER & SENSOR ASSY.				Yes
TB46111230002	CONDUCTIVITY SENSOR				Yes
TB51510305	pH TRANSMITTER				Yes
TB557125B1FB	pH SENSOR				Yes

Task Instructions

Instruction Code FIT-561 **Date Last Edited**
REFER TO BOOK FIT-561 SEECO: QUARTERLY; 1) Perform calibration on Ph, conductivity, and temperature. 2) Clean lubricate, and inspect sampler.
ANNUALLY; 1) Perform calibration procedures, on zero and span chart recorder inputs.

Task No. FPH-580-1
Description RECIRULATION PUMP IN FIRE PUMP HOUSE
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FPH-000-HYD
Equipment Description FLUSH AND PUMP HYDRANTS
Location ON SITE GROUNDS

Perform Every 180.0 Day(s)

Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 4/27/04
Tenant

Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FPH-580-1
Equipment Description RECIRULATION PUMP
Location FIRE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 4/27/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FPH-580-GP
Equipment Description PSI PUMP
Location FIRE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 4/27/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FPH-580-P
Equipment Description MAIN FIREWATER PUMP
Location FIRE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 4/27/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FPH-580-UH
Equipment Description FIRE BUILDING UNIT HEATER
Location FIRE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 4/27/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. FPH-HW
Equipment Description HOT WATER HEATER
Location FIRE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 4/27/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code FPH-580-1 **Date Last Edited** 10/31/03

REFER TO BOOK FPH-580 FOR ALL UNITS IN FIRE PUMP HOUSE; These units in the fire pump house are only used and operated in the winter months. Before start up and operation of of these peices of equipment check all oil levels and grease all pumps and motors with a Mobil Grease 2. On the hot water heater the ventulation system should be checked. Also check the flame on the burners.
Check all piping for any leakage. [FPH-580-P] On this unit check the oil on oil lubricated unit. Grease zerts. Check the packing and replace if necessary. Take a vibration reading on the bearing housing. Check shaft or sleeve for scoring. Hydrants should be flushed and run some water for some time. In the winter months the hydrants should be pumped out to keep water from frezzing in the hydrants. Hyfrants should be flushed 2 times a year.

Task No. FPH-HW
Description FIRE WATER PUMP HOUSE - WATER HEATER
Assigned To
WO Type PM
Expense Class
Priority 3.00
Multitask No
In-service Task No

Craft	Crew Size	Estimated Labor Hours
LABOR		

Equipment No. FPH-HW
Equipment Description HOT WATER HEATER
Location FIRE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 3/17/00
Next Due Date 10/ 2/00
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
L37-813 HVAC CONTROLS	HVAC CONTROLS, HOT SURFACE INGNITION , FIRE WATER				Yes

Task Instructions

Instruction Code FPH-HW **Date Last Edited** 7/26/00

FIRE WATER PUMP HOUSE - HOT WATER FURANCE MAINTENANCE:

SHUT OFF GAS AT VALVE INSIDE AND VALVE OUTSIDE BUILDING.

SHUT OFF POWER BY TURNING SWITCH AT FURNACE OFF AND DISCONNET AT BRAKER BOX ON N. WALL.

TAKE OUTSIDE FURNACE SHROUD OFF USING 5/16" SOCKET.

UNBOLT BLACK MANIFOLDS AND DISCONNECT GAS CONNECTION AT TOP USING CHANNEL LOCKS-REMOVE BOTH MANIFOLODS.

UNBOLT THERMAL COUPLER AND GROUND WIRE AND REMOVE OR LAY ON TOP PART OF INSIDE FRUNACE.

UNBOLT BOTH RED 3" ANGLE FLOOR MOUMTS USING 3/8" DRIVE THIS ALLOWS INSIDE GAS DIFFUSER SHROUD ASSEMBLY TO PULL OUT WITHOUT PROBLEMS.

UNBOLT GAS DIFFUER SHROUD ASSEMBLY AND PULL EQUALLY ON METAL PULL BARS UNITL YOU HAVE REMOVE ENTIRE SHROUD.

REPAIR AND OR CLEAN AS NEEDED.

REPLACE ALL PARTS IN REVERSE ORDER ABOVE

CHECK OUT HEATER IGNITER, FOR ANY BROKEN ENDS. REPLACE IF NEEDED WITH SPARE PARTS LISTINGS.

Task No. FPSP-00
Description FREEZE PROTECTION SYSTEM PANEL
Assigned To
WO Type
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FPSP-01
Equipment Description FREEZE PROTECTION SYSTEM PANEL
Location BLOWER BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/ 5/02
Next Due Date 11/ 1/03
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 2.00
Down Time
Must Be Down No

Equipment No. FPSP-02
Equipment Description FREEZE PROTECTION SYSTEM PANEL
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant
Perform Every Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code FPSP-00 **Date Last Edited**

REFURE TO BOOK FPSP-00 FOR INFORMATION ON THE FREEZE PROTECTION SYSTEM. PROJECT ID: 95FCO31, OPERATION PROCESS TEMPERATURES ARE SET AT 40F, AREA CLASSIFICATION CODE: HAZARDOUS, PIPE CATEGORY: STEEL, PVC.
IN THE FALL OF EACH YEAR: YOU SHOULD GO AROUND AND CHECK ALL SIGNAL LIGHTS AT EACH POWER CONNECTION PORT TO BE SURE ALL HEAT LINES ARE WORKING. IF YOU FIND ONE THAT IS NOT WORKING, GO THE THE PROPER CONTOL PANEL AND CHECK THE BRAKERS.
REFURE TO MANUAL FOR THE LAY-OUTS OF EACH CABLE. (REMEMBER; THE SYSTEM IS 208 VOLTS AND ALL PIPING IS LABELED "ELECTRIC TRACED")

Task No. GAC-551
Description GALGON CARBON VESSELS
Assigned To
WO Type
Expense Class
Priority 3.00
Multitask Yes
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. GAC-551-A- SE
Equipment Description GAC CARBON VESSEL SOUTH EAST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 1/28/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. GAC-551-B-NE
Equipment Description CARBON VESSEL 551-B NORTH EAST

Location	GROUND TREATMENT	Perform Every	180.0 Day(s)
Sub-location 1	BUILDING	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	4.00
Date Last Performed	9/24/03	Down Time	
Next Due Date	1/28/04	Must Be Down	No
Tenant			

Equipment No.	GAC-552-A SW		
Equipment Description	CARBON VESSEL 552-A SOUTH WEST		
Location	GROUND TREATMENT	Perform Every	180.0 Day(s)
Sub-location 1	BUILDING	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	4.00
Date Last Performed	9/24/03	Down Time	
Next Due Date	1/28/04	Must Be Down	No
Tenant			

Equipment No.	GAC-552-B-NW		
Equipment Description	CARBON VESSEL 552-B NORTH WEST		
Location	GROUND TREATMENT	Perform Every	180.0 Day(s)
Sub-location 1	BUILDING	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	4.00
Date Last Performed	9/24/03	Down Time	
Next Due Date	1/28/04	Must Be Down	No
Tenant			

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code GAC **Date Last Edited** 2/ 6/01

REFER TO BOOKS GAC-551:

Task No.	GUH		
Description	GAS UNIT HEATERS THROUGH OUT PLANT SITE		
Assigned To		Priority	
WO Type	PM	Multitask	Yes
Expense Class		In-service Task	Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No.	GUH-971-A		
Equipment Description	GAS UNIT HEATER-NORTH		
Location	SLUDGE TREATMENT BUILDING	Perform Every	365.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No
Tenant			

Equipment No.	GUH-971-B		
Equipment Description	GAS UNIT HEATER-NORTH		
Location	SLUDGE TREATMENT BUILDING	Perform Every	365.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No

Tenant

Equipment No. GUH-971-C
Equipment Description GAS UNIT HEATER-NORTH
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-971-D
Equipment Description GAS UNIT HEATER-WEST
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-971-E
Equipment Description GAS UINT HEATER-WEST
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-971-F
Equipment Description GAS UNIT HEATER-SOTH
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-971-G
Equipment Description GAS UNIT HEATER-SOUTH
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-971-H
Equipment Description GAS UINT HEATER-SOUTH
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-972-A

Equipment Description GAS UNIT HEATER-WEST
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-972-B
Equipment Description GAS UNIT HEATER-
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-A
Equipment Description GAS UNIT HEATER-EAST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-B
Equipment Description GAS UNIT HEATER-SOUTH
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-C
Equipment Description GAS UNIT HEATER-SOUTH
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-D
Equipment Description GAS UNIT HEATER-WEST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-E
Equipment Description GAS UNIT HEATER-WEST

Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-F
Equipment Description GAS UNIT HEATER-WEST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-G
Equipment Description GAS UNIT HEATER-NORTH
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-H
Equipment Description GAS UNIT HEATER-EAST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-973-I
Equipment Description GAS UNIT HEATER-EAST
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-974-A
Equipment Description GAS UNIT HEATER-NORTH
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/26/02
Next Due Date 10/ 9/03
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. GUH-974-B
Equipment Description GAS UNIT HEATER-WEST
Location GROUND TREATMENT
Sub-location 1 BUILDING

Perform Every 365.0 Day(s)
Schedule Type Fixed

Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No
Tenant			

Equipment No.	GUH-975		
Equipment Description	GAS UNIT HEATER-EAST		
Location	GROUND TREATMENT	Perform Every	365.0 Day(s)
Sub-location 1	BUILDING	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No
Tenant			

Equipment No.	GUH-976		
Equipment Description	GAS UNIT HEATER		
Location	ELETRICAL ROOM	Perform Every	365.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No
Tenant			

Equipment No.	GUH-977-A		
Equipment Description	GAS UNIT HEATER-SOUTH		
Location	BLOWER BUILDING	Perform Every	365.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No
Tenant			

Equipment No.	GUH-977-B		
Equipment Description	GAS UNIT HEATER-SOUTH		
Location	BLOWER BUILDING	Perform Every	365.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No
Tenant			

Equipment No.	GUH-977-C		
Equipment Description	GAS UNIT HEATER-NORTH		
Location	BLOWER BUILDING	Perform Every	365.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00
Date Last Performed	11/26/02	Down Time	
Next Due Date	10/ 9/03	Must Be Down	No
Tenant			

Equipment No.	GUH-977D		
Equipment Description	GAS UNIT HEATER-NORTH		
Location	BLOWER BUILDING	Perform Every	365.0 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	3.00

Date Last Performed	11/26/02	**Down Time**	
Next Due Date	10/ 9/03	**Must Be Down**	No
Tenant			

Equipment No.	GUH-978-A		
Equipment Description	GAS UNIT HEATER-PUMPING BLD		
Location	GROUND TREATMENT	**Perform Every**	365.0 Day(s)
Sub-location 1	BUILDING	**Schedule Type**	Fixed
Sub-location 2	-	**Task Duration**	
Sub-location 3	-	**No. of Times Completed**	3.00
Date Last Performed	11/26/02	**Down Time**	
Next Due Date	10/ 9/03	**Must Be Down**	No
Tenant			

Equipment No.	GUH-978-B		
Equipment Description	GAS UINT HERATER-PUMPING BLD.		
Location	SLUDGE PUMP HOUSE	**Perform Every**	365.0 Day(s)
Sub-location 1	-	**Schedule Type**	Fixed
Sub-location 2	-	**Task Duration**	
Sub-location 3	-	**No. of Times Completed**	3.00
Date Last Performed	11/26/02	**Down Time**	
Next Due Date	10/ 9/03	**Must Be Down**	No
Tenant			

Equipment No.	GUH-980		
Equipment Description	GAS UNIT HEATER-TOU BLD		
Location	THERMAL OXIDATION	**Perform Every**	365.0 Day(s)
Sub-location 1	BUILDING	**Schedule Type**	Fixed
Sub-location 2	-	**Task Duration**	
Sub-location 3	-	**No. of Times Completed**	3.00
Date Last Performed	11/26/02	**Down Time**	
Next Due Date	10/ 9/03	**Must Be Down**	No
Tenant			

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code GUH **Date Last Edited**

REFER TO FILE GUH: 1) Clean all dirt and grease from the primary and secondary combustion air openings. 2) Clean the fan blade, fan guard and motor. 3) Clean the heat exchanger both internally and externally. 4) Check the pilot burner and main burners for scale, dust or lint. 5) Check the vent system . 6) Check the wiring for amy damage wires.

Task No.	John Deere-870		
Description	JOHN DEERE TRACTOR - 870		
Assigned To	DL	**Priority**	3.00
WO Type	PM	**Multitask**	No
Expense Class		**In-service Task**	Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No.	John Deere-870		
Equipment Description	John Deere Tractor-870		
Location	SLUDGE TREATMENT BUILDING	**Perform Every**	Day(s)
Sub-location 1	-	**Schedule Type**	Floating
Sub-location 2	-	**Task Duration**	
Sub-location 3	-	**No. of Times Completed**	
Date Last Performed		**Down Time**	
Next Due Date		**Must Be Down**	No
Tenant			

Equipment No.	Meter Name	Last Performed At

Task No. M-701
Description CHANGE OIL IN GEAR BOX, GREASE UNIT
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. M-701
Equipment Description SLUDGE TANK MIXER
Location OUTSIDE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 7/03
Next Due Date 1/ 6/04
Tenant
Perform Every 120.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At
M-701	METER	4,117.00

Task Instructions

Instruction Code M-701 **Date Last Edited**

FEFER TO BOOK M-701: Every 4 MONTHS check the oil level in the gear box, making sure that it reads full. If oil is to be added use Texaco regal oil R&O 150.
Using a NLGI grease #2. appily 4 shoots of grease in the two zerts, upper and lower.
Corrosion Protection must also be done by appiling a anit-seize to the upper portion of direct connected mixer shafts.

Task No. MAN-000
Description MANHOLES TO BE CHECK AND PUMPED OF STANDING WATER
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. MAN-000
Equipment Description MANHOLES, TO BE CHECKED
Location ON SITE GROUNDS
Sub-location 1 OFF SITE
Sub-location 2 -
Sub-location 3 -
Date Last Performed 7/30/03
Next Due Date 2/ 3/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code MAN-000 **Date Last Edited**

CHECK ALL MANHOLES AND PULLL PORTS AND PUMP OUT ANY STANDING WATER. CHECK ALL WIRING FOR FRAYS.

Task No. MONO-1
Description MONORAIL LIFTS FOR THE FILTER PRESSES

Assigned To		Priority	
WO Type	PM	Multitask	Yes
Expense Class		In-service Task	Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No.	MONORAIL-1		
Equipment Description	MOMORAIL TO FILTER PRESS 722		
Location	SLUDGE TREATMENT BUILDING	Perform Every	60.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	16.00
Date Last Performed	11/13/03	Down Time	
Next Due Date	12/ 6/03	Must Be Down	No
Tenant			

Equipment No.	MONORAIL-2		
Equipment Description	MONORAIL TO FILTER PRESS 721		
Location	SLUDGE TREATMENT BUILDING	Perform Every	60.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	16.00
Date Last Performed	11/13/03	Down Time	
Next Due Date	12/ 6/03	Must Be Down	No
Tenant			

Equipment No.	MONORAIL-3		
Equipment Description	MONORAIL TO FILTER PRESS 723		
Location	SLUDGE TREATMENT BUILDING	Perform Every	60.00 Day(s)
Sub-location 1	-	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	16.00
Date Last Performed	11/13/03	Down Time	
Next Due Date	12/ 6/03	Must Be Down	No
Tenant			

Equipment No.	MONORAIL-4		
Equipment Description	1 TON HOIST IN GTB		
Location	GROUND TREATMENT	Perform Every	60.00 Day(s)
Sub-location 1	BUILDING	Schedule Type	Fixed
Sub-location 2	-	Task Duration	
Sub-location 3	-	No. of Times Completed	16.00
Date Last Performed	11/13/03	Down Time	
Next Due Date	12/ 6/03	Must Be Down	No
Tenant			

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code MONO-1 **Date Last Edited**

REFER TO FILE MONORAIL: 1) Check controls, limit switches and brake for proper operaton. 2) Check nuts, bolts, rivets, and other hardware for looseness, damage and corrosion, replace or repair damaged parts as required. 3) Check housings and load block for cracked or wear. 4) Check for worn, corroded, cracked or distorted parts suchas pins, bearings, bushings, shafts, couplings, and gears, replace or repair as required. 5) Check disc brake for glazing, contamination or excessive wear. 6) Perform load brake test. 7) Thoroughly inspect the wire rope for deterioration, reduction in diameter, broken, worn and corroded wires.

Task No.	MR-000		
Description	Take Equipment Meter Readings		
Assigned To		Priority	

WO Type
Expense Class
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. Meter Readings-000
Equipment Description Perform meter reading on equipment
Location ALL BUILDINGS
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 7/03
Next Due Date 6/30/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code MR-000 **Date Last Edited**

Record mater readings of equipment and record Hrs. on Totalizer Meter Sheets. This is to check Hrs. of run time on each pice of equipment.

Task No. NPWS-P1
Description NON-POTABLE WATER SYSTEM
Assigned To
WO Type PM
Expense Class
Priority
Multitask Yes
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. NPWS-935-P1
Equipment Description NON-POTABLE WATER SYSTER PUMP 1
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 12/10/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 23.00
Down Time
Must Be Down No

Equipment No. NPWS-935-P2
Equipment Description NON POTABLE WATER SYSTEM PUMP 2
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 12/10/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 23.00
Down Time
Must Be Down No

Equipment No. NPWS-935-P3
Equipment Description NON POTABLE WATER SYSTEM PUMP 3
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/10/03
Next Due Date 12/10/03
Tenant

Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 23.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code NPWS-P1 **Date Last Edited**

REFERE TO FILE NPWS: 1) The lag pump doesn't usually run so we need to operate the lag pump on hand for about 10 mins. You can cut time by running both lag pumps in hand at the same time.
NOTE! On the lag pumps there is a auto and lag. The auto is a first run lag, and the lag is second run. BI-ANNUALY alternate the lag pumps. MONTHLY check the motor bearings and lubricate if necessary.
YEARLY: Clean and or rebuild presure regulating valves.

Task No. PAP-630
Description PHOSPHORIC ACID PUMPS
Assigned To **Priority**
WO Type PM **Multitask** No
Expense Class **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. PAP-630
Equipment Description PHOSPHORIC ACID PUMPS 1
Location GROUND TREATMENT **Perform Every** 90.00 Day(s)
Sub-location 1 BUILDING **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 11.00
Date Last Performed 10/20/03 **Down Time**
Next Due Date 1/ 7/04 **Must Be Down** No
Tenant

Equipment No. PAP-631
Equipment Description PHOSPHORIC ACID PUMPS 2
Location GROUND TREATMENT **Perform Every** 90.00 Day(s)
Sub-location 1 BUILDING **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 11.00
Date Last Performed 10/20/03 **Down Time**
Next Due Date 1/ 7/04 **Must Be Down** No
Tenant

Equipment No. PAP-632
Equipment Description PHOSPHORIC ACID PUMP 3
Location GROUND TREATMENT **Perform Every** 90.00 Day(s)
Sub-location 1 BUILDING **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 11.00
Date Last Performed 10/20/03 **Down Time**
Next Due Date 1/ 7/04 **Must Be Down** No
Tenant

Equipment No.	Meter Name	Last Performed At
PAP-630	HOUR	303.00
PAP-631	HOUR	3,062.00
PAP-632	HOUR	3,081.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
P46881	BALL HOUSING, PHOSPHORIC ACID PUMPS				Yes
U-26142	P.M. PUMP REPAIR KIT FOR ONE HEAD				Yes
U18443 W&T	W&T OIL U18443 FOR CAUSTIC FEED PUMP				Yes

Task Instructions

Instruction Code PAP-630 **Date Last Edited** 8/ 7/01

REFER TO BOOK, PAP-630 8760 HRS. 1) Replace diaphragm, check balls, ball guides, seats, o-rings and seatings springs if used. 2) Replace wearing parts of optional main connection(U22937 or U21831or U24489 if used). 3) Maintain oil level at line on resevoir dipstick. Oil used the pumps is a 90W oil.

Task No. PCT-201-W
Description WINCH INSIDE OF PCT 201
Assigned To
WO Type
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. PCT-201-W
Equipment Description DECANT WINCH INSIDE PCT 201
Location PCT-201
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/14/02
Next Due Date 11/14/03
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. PCT-201/202
Description GASKET MAINTENANCE/OR REPLACEMENT
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. PCT-201/202
Equipment Description PCT MANWAYS
Location PCT-201
Sub-location 1 PCT-202
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
4520758-90	MANWAY/O-RING GASKET SIZE: 275C/S X 27.75OID				Yes
4520840	MANWAY/O-RING GASKET SIZE: 471 COPOUND 70 BUNA				Yes

Task Instructions

Instruction Code PCT-201/202 **Date Last Edited**

FRFER TO FILE: PCT-201/202; MANWAY: Maintenance on the O-ring should be inspected prior to every cloosing. Frequency of replacement will depend upon such factors as operating pressure and temperature.

Task No. PMP-620
Description POLYMER FEED SYSTEM- VISUAL INSPECTION AND CALIBRATION
Assigned To **Priority**
WO Type PM **Multitask** No
Expense Class **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. PMP-620
Equipment Description POLYMER METERING PUMP 1
Location SLUDGE TREATMENT BUILDING **Perform Every** 30.00 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 24.00
Date Last Performed 9/26/03 **Down Time**
Next Due Date 10/18/03 **Must Be Down** No
Tenant

Equipment No. PMP-621
Equipment Description POLYMER METERING PUMP 2
Location SLUDGE TREATMENT BUILDING **Perform Every** 30.00 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 21.00
Date Last Performed 9/26/03 **Down Time**
Next Due Date 10/18/03 **Must Be Down** No
Tenant

Equipment No. PMP-622
Equipment Description POLYMER MERERING PUMP 3
Location SLUDGE TREATMENT BUILDING **Perform Every** 30.00 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 24.00
Date Last Performed 9/ 5/03 **Down Time**
Next Due Date 10/18/03 **Must Be Down** No
Tenant

Equipment No.	Meter Name	Last Performed At
PMP-620	hour	8,911.00
PMP-621	hour	9,631.00
PMP-622	hour	34,704.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
1411001	BRNG, FLANGE, N6908				Yes
1414001	BRNG, THRUST, SELF-CTR				Yes
1450430	BELT, TIMING, 1/2" X 30"				Yes
7070100	PULLEY, TIMING, ALUM				Yes
7802910	SEAL, MECH, 1/2" PB				Yes

Task Instructions

Instruction Code PMP-620 **Date Last Edited**

REFER TO BOOK PMP-620: WEEKLY 1) Check all piping for any leakage and clean up any spills in the work area. 2) Calibrate pump and record if needed.

Task No. PRESSURE WASHER
Description GASOLINE PRESSURE WASHER
Assigned To
WO Type
Expense Class
Priority 3.00
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. POWER WASHER
Equipment Description POWERED PRESSURE WASHER
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/26/03
Next Due Date 10/ 4/03
Tenant
Perform Every 60.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 10.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task No. PWP-742
Description PRESS WASH PUMP
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. PWP-742
Equipment Description PLATE WASH PUMP FOR PRESS
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/17/03
Next Due Date 11/28/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 21.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At
PWP-742	hour	7,603.00

Task Instructions

Instruction Code PWP-742 **Date Last Edited**

REFER TO BOOK PWP-742: 1) Perform a DAILY check of oil levels, and leakag. 2) ANNUALY OR
000 HRS. change oil in gear box using TEXACO MEROPA 320.
ECAUSE OF OIL LEAKING AROUND THIS PUMP WILL PUT IT ON A 30 CHECK. THE OIL WAS CLEANED UP
AND PUMP WAS INSPECTED OIL LEVELS WERE GOOD FOR THE MONTH OF MAY.

Task No. RSP-220
Description RETURN SLUDGE PUMP
Assigned To **Priority**
WO Type PM **Multitask** No
Expense Class **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. RSP-220
Equipment Description RETURN SLUDGE PUMP TO 1ST STAGE
Location SLUDGE PUMP HOUSE **Perform Every** 180.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 6.00
Date Last Performed 7/24/03 **Down Time**
Next Due Date 11/ 9/03 **Must Be Down** No
Tenant

Equipment No. RSP-221
Equipment Description RETURN SLUDGE TO 1ST STAGE
Location SLUDGE PUMP HOUSE **Perform Every** 180.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 7.00
Date Last Performed 8/28/03 **Down Time**
Next Due Date 5/ 7/04 **Must Be Down** No
Tenant

Equipment No. RSP-222
Equipment Description RETURN SLUDGE TO 1ST STAGE
Location SLUDGE PUMP HOUSE **Perform Every** 180.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 6.00
Date Last Performed 7/24/03 **Down Time**
Next Due Date 11/ 9/03 **Must Be Down** No
Tenant

Equipment No. RSP-320
Equipment Description RETURN SLUDGE PUMP TO 2ND STAGE
Location SLUDGE PUMP HOUSE **Perform Every** 180.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 6.00
Date Last Performed 7/24/03 **Down Time**
Next Due Date 11/ 9/03 **Must Be Down** No
Tenant

Equipment No. RSP-321
Equipment Description RETURN SLUDGE PUMP TO 2ND STAGE
Location SLUDGE PUMP HOUSE **Perform Every** 180.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 6.00
Date Last Performed 7/24/03 **Down Time**
Next Due Date 11/ 9/03 **Must Be Down** No

Tenant

Equipment No. RSP-322
Equipment Description RETURN SLUDGE TO 2ND STAGE
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 7/24/03
Next Due Date 11/ 9/03
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
OIL- R&O 100	TEXACO REGAL R&O 100				Yes

Task Instructions

Instruction Code RSP-220 **Date Last Edited**

REFER TO FILE RSP-220: 1) DAILY check ball oiler and fill to full level using oil TEXACO REAL R&0 100. 2) Chandge oil in pump every 4000 Hrs. GREASING MOTOR: Motor must be at rest and wlectrical controls should be locked out, while motor is being servidced. To relubricate bearingsk, remove the drain plug. Inspect grease drain and remove any blockage with a probe taking care not to damage bearing. Use grease No. 2, adding 9 shots, Run the motor for 15 to 30 mins. with the drain plug removed to allow purging of any excess grease. Replace drain plug and put motor in service. (This should be done ever 2 years adding .4 ozs of grease.)

Task No. SNAP-8245
Description SNOW BLOWER MAINTENANCE FOR EACH SEASON
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. SNAP-8245
Equipment Description SNAPPER SNOW BLOWER
Location PCT-301
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/13/03
Next Due Date 10/30/04
Tenant

Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
1-3939	SNOW BLOWER AUGER DRIVE BELT				Yes
2-9101	SNOW BLOWER WHEEL DRIVE BELT				Yes
3-6122	SNOW BLOWER SCRAPER BLADE				Yes

Task Instructions

Instruction Code SNAP-8245 **Date Last Edited**

REFER TO FILE SNP-8245: Before each season of operation; 1) Apply grease to the gear case which is located in front of the gear case, also grease auger bearing which is located on each end of the auger, and grease fittings for the auger shaft which is located in the middle of each auger. Remove shear bolts and rotate auger to distribute grease evenly

around shaft. Reinstall shear bolts and nuts.
Make a visually check of the engine drive belt and the wheel drive belt, for cracking, fraying, severed or belt strands exposed.
Check oil on a regular bases and fill with SAF 5W30 for winter temp. below 32F. Change the oil every 25 hours.
STORAGE: It is best if the engine is not to be used over 30 days, to drain the fuel system. Remove all gasoline from carburetor and fuel tank to prevent gum deposits form forming on these parts and causing possible malfunction on the engine. Change oil at this time before the new season. And pull spark plug and clean.
SERVICE SCHEDULE:
Engine oil change, 10 hrs.
Spark Plug change, 100 hrs.
Drive Belts check, 25 hrs.

Task No. SP
Description SCUM PUMP IN PCT-201
Assigned To
Priority
WO Type PM
Multitask No
Expense Class
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. PCT-201-SP
Equipment Description SCUM PUMP INSIDE PCT-201
Location PCT-201
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/15/03
Next Due Date 10/21/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No. PCT-202-SP
Equipment Description SCUM PUMP INSIDE PCT-202
Location PCT-202
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/15/03
Next Due Date 10/21/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No. PCT-301-SP
Equipment Description SCUM PUMP INSIDE PCT-301
Location PCT-301
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/15/03
Next Due Date 10/21/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 8.00
Down Time
Must Be Down No

Equipment No. PCT-302-SP
Equipment Description SUM PUMP NSIDE PCT-302
Location PCT-302
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/15/03
Next Due Date 10/21/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 9.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code SP **Date Last Edited**

REFERE TO BOOK C-201: QUARTERLY; Remove water from oil fill. Check oil to ensure 1/8"over motor plate thruogh opening. Use oil fill tube to fill if necessary. Use only high grade transformer oil or special Hydromatic submersible oil in the motor.

Task No. SP-130
Description SUMP PUMPS IN VAULTS. GTB & STB
Assigned To **Priority**
WO Type PM **Multitask** No
Expense Class **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. SP-130
Equipment Description SLUDGE VAULTS IN GTB& STB
Location GROUND TREATMENT
Sub-location 1 SLUDGE TREATMENT BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/23/03
Next Due Date 10/30/03
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. SP-130-A
Equipment Description SUMP PUMP IN VAULT GTB
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/23/03
Next Due Date 10/30/03
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. SP-130-B
Equipment Description SUMP PUMP IN VALUT GTB
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/23/03
Next Due Date 10/30/03
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. SP-131-A
Equipment Description SUMP PUMP IN VAULT STB
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/23/03
Next Due Date 10/30/03
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No. SP-131-B
Equipment Description SUMP PUMP IN VAULT STB
Location SLUDGE TREATMENT BUILDING
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/23/03
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time

Next Due Date 10/30/03 **Must Be Down** No
Tenant

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
060817	SEAL ON VAULT PUMP 3 IN				Yes
1" double type 21 rotary	SEAL ON VAULT PUMP 1 1/2 IN				Yes
85209	PUMP OVERHAUL KIT FOR VAULT PUMP IN GTB				Yes
85210	PUMP OVERHAUL KIT FOR VAULT SLUDGE PUMP 131				Yes

Task Instructions

Instruction Code SP-130 **Date Last Edited**

REFER TO FILE SP-130: EVERY TWO WEEKS; Hose down the vault and clean sludge. ANNUAL; 1) Visually inspect cable and pump for any damage. 2) Inspect inpeller and body for clogging. EVERY 12 MONTHS; 1) Perform 12 month inspection. 2) inspect motor and seal chamber for oil leveland contamination. EVERY 4 YEARS: A complete overhaulshould be performed to detect worn parts. The following parts should be replaced: Double Seal, Ball Bearings, Square Rings and "O" Rings, Diaghragm, Cooling oil, Cord.

Task No. SS-221
Description EIM CONTROL VALVES.
Assigned To **Priority**
WO Type PM **Multitask** No
Expense Class **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. SS-221-F
Equipment Description EIM CONTROL VALVES
Location SLUDGE PUMP HOUSE **Perform Every** 365.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 3.00
Date Last Performed 5/27/03 **Down Time**
Next Due Date 1/ 6/04 **Must Be Down** No
Tenant

Equipment No. SS-221-G
Equipment Description EIM CONTROL VALVES
Location SLUDGE PUMP HOUSE **Perform Every** 365.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 3.00
Date Last Performed 5/27/03 **Down Time**
Next Due Date 1/ 6/04 **Must Be Down** No
Tenant

Equipment No. SS-222-F
Equipment Description EIM CONTROL VALVES
Location SLUDGE PUMP HOUSE **Perform Every** 365.0 Day(s)
Sub-location 1 - **Schedule Type** Fixed
Sub-location 2 - **Task Duration**
Sub-location 3 - **No. of Times Completed** 3.00
Date Last Performed 5/27/03 **Down Time**
Next Due Date 1/ 6/04 **Must Be Down** No

Tenant

Equipment No. SS-222-G
Equipment Description EIM CONTROL VALVES
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/27/03
Next Due Date 1/ 6/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. SS-321-F
Equipment Description EIM CONTROL VALVES
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/27/03
Next Due Date 1/ 6/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. SS-321-G
Equipment Description EIM CONTROL VALVES
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/27/03
Next Due Date 1/ 6/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. SS-322-F
Equipment Description EIM CONTOL VALVES
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/27/03
Next Due Date 1/ 6/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No. SS-322-G
Equipment Description EIM CONTOR VALVES
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 5/27/03
Next Due Date 1/ 6/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 3.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code SS-221 **Date Last Edited**

REFER TO FILE SS-221: ANNUAL; A yearly check should be made on the actuator. 1) Disconnect all electrical power to actuator. 2) Open electrical enclosure. Inspect and tighten all eletrical connections. 3) Visually inspect for any electrical or mechanical damage. Replace worn or damaged components. 4) Check lubrication consistency and levels. Fill or replace if required.

Task No. STP-211
Description SLUDGE TRANSFER PUMP
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. STP-211
Equipment Description SLUDGE TRANSFER PUMP TO SLUDGE HOLDING
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 12/16/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No. STP-212
Equipment Description SLUDGE TRANSFUR PUMP TO SLUDGE HOLDING
Location SLUDGE PUMP HOUSE
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/24/03
Next Due Date 12/16/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 11.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At
STP-211	hour	817.00
STP-212	hour	836.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
OIL- R&O 100	TEXACO REGAL R&O 100				Yes

Task Instructions

Instruction Code STP-211 **Date Last Edited**

REFER TO FILE RSP-220: 1) DAILY check ball oiler and fill to full level using oil TEXACO REAL R&O 100. 2) Chandge oil in pump every 1000 Hrs. and grease drive moto

Task No. TABS-00
Description SEWAGE PUMPING STATION/ PUMPS 01,02
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. ABS-01
Equipment Description SEWAGE PUMP STATION/PUMP-1
Location ON SITE GROUNDS
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/ 5/03
Next Due Date 2/17/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No. ABS-02

Equipment Description SEWAGE PUMP STATION/PUMP 02
Location ON SITE GROUNDS
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/ 5/03
Next Due Date 2/17/04
Tenant
Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code TABS-00 **Date Last Edited**

REFER TO FOLE ABS-01: EVERY 6TH MONTH/Make a visual inspection of the sewage vault. The seal oil in the oil chamber of the pumps should be checked or when the seal alarm signal is given. It the pump is pulled, check the impeller.
Also check the float levels, to make sure the second stand-by pumps comes on, and a high level is given.

Task No. TF-521
Description TERTIARY FILTERS/CHECK AIR LIFTS AND AIR PRESSURES
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. TF-521
Equipment Description TERTIARY FILTER 1
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/13/03
Next Due Date 12/13/03
Tenant
Perform Every 30.00 Day(s)
Schedule Type Floating
Task Duration
No. of Times Completed 23.00
Down Time
Must Be Down No

Equipment No. TF-522
Equipment Description TERTIARY FILTER 2
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/13/03
Next Due Date 12/ 1/03
Tenant
Perform Every 30.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 23.00
Down Time
Must Be Down No

Equipment No. TF-523
Equipment Description TERTIARY FILTER 3
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/13/03
Next Due Date 12/ 1/03
Tenant
Perform Every 30.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 24.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code TF-521 **Date Last Edited**

REFER TO FILE TF-521: The tertiary filters do not require a regular maintenance. But the units do require a daily inspection of the air lifts, to see that the sand is being air lifted to the top of the filter. Increases in air pressure should also be monitored. Such increases indicated pluggage of the air injectors. The injectors will need to be replaced when sufficient volumes of air can no longer pass through the injectors at 25 psi to achiev the desired sand movement.
The operator should look particularly for increases in headloss without corresponding increases in influent flowrate. Such an increase is indicative of changes in feedwater characteristics and /or a buildup of solids in the filter bed. When such an occurrence is observed the operator should increase the flow to the air lift to increase the rate at which the media bed turns over.

Task No. TORO-000
Description TORO SNOWTHROWER, MAINTENANCE
Assigned To LC
WO Type
Expense Class
Priority 3.00
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. TORO-000
Equipment Description TORO SNOWTHROWER
Location -
Sub-location 1 -
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/ 5/02
Next Due Date 10/26/03
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 1.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code TORO-000 **Date Last Edited** 11/22/00

REFERE TO FILE: TORO-000 Your Toro Snowthrower is prwered by a two-cycle engine that requires a 50:1 gasoline to oil mixture.

Check for loose fasteners and tighten them if necessary.
Check the scraper, Replace if necessary.
Inspect the rotor blades. Replace is necessary.
Clean, inspect, and gap spark plug if necessary.
Inspect the drive belt.
Before storing, drain the fuel and run the engine until the fuel tank and the carburetor are dry.

Task No. TOU-800
Description TOU COOLING PUMP/OIL LEVELS/GREASE
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. TOU-800-A
Equipment Description TOWER RE-CIRCULATION PUMP 1
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 8/03
Next Due Date 9/24/03
Tenant
Perform Every 48.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 12.00
Down Time
Must Be Down No

Equipment No. TOU-800-B
Equipment Description TOWRE RE-CIRCULATION PUMP 2
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 8/ 8/03
Next Due Date 9/24/03
Tenant
Perform Every 48.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 12.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
7E-EPDM	SPIDER DRIVE BETWEEN MOTOR AND PUMP				No
EZ-1	EZ-1 SEAL FOR PUMP				No
REGAL OIL 100	REGAL OIL 100				No

Task Instructions

Instruction Code TOU-800 **Date Last Edited**
REFER TO FILE TOU-800: 1) DAILY check ball oiler and fill to full level using oil TEXACO REAL R&O 100. 2) Chandge oil in pump every 1000 Hrs. and grease drive motor.

Task No. TOU-800-PF
Description GREASE ZERTS/ON PURGE FAN
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. TOU-800-PF
Equipment Description PURGE FAN ON THE TOU
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/19/03
Next Due Date 9/29/03
Tenant
Perform Every 14.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 46.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code TOU-800-PF **Date Last Edited**
REFER TO BOOK T.O.U. UNIT: EVERY 2ND WEEK: Lubricate purge fan bearings, with 8 shots of grease in pillow blocks.

Task No. TOU-800-ST
Description SCURBBER TOWER
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours
FROMAN		
LABOR		

Equipment No. TOU-800-ST
Equipment Description SCRUBBER TANK ON THE TOU
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 11/ 5/02
Next Due Date 10/ 1/03
Tenant

Perform Every 360.0 Day(s)
Schedule Type Fixed
Task Duration 1.00
No. of Times Completed 2.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
156-031-01	Wet End Kit for Drain tank of the T.O.U.				No

Task Instructions

Instruction Code TOU-800-ST **Date Last Edited** 10/18/00

REFER TO BOOK TOU UNIT: Make a visually inspection of all piping, valves, for leakage. This P.M. requires a schedule PLANT SHUT DOWN! 1) Remove float out of water columb and clean columb with a brush, addind HCL into columb. 2) Inspect burner filters and clean. Inspect spark ignitors. 3) Inspect main fan and purge fan wheels. 4) Remove side cover at the top of tower, and inspect scrubber spray nozzles, also inspect venturi spary nozzle. 5) Acid clean tower, using HCL added to water already in tower. Run pumps for one or two hours. This helps clean the spary nozzles and paddle wheels on all flow meters, also any chemical build up on the media. 6) Empty water acid out of tower, and clean any sludge from the bottom of tower using a wet vac. 7) Inspect machanical seal on recycle pumps, alos clean strainers. 8) Remove demisters form inlet line and clean with pressure washer, and soap. Check drain. 9) Clean the VFD cabinet using air, to remove any dust and dirt in the unit, be sure to clean the fans. Spray some wd-40 into the fans to lub.

Task No. TOU-800-TOU
Description CHECK BURNERS, AND GREASE ALL VALVES.
Assigned To
WO Type PM
Expense Class

Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. TOU-800-TOU
Equipment Description THERMAL OXIDATION UNIT
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/ 5/03
Next Due Date 2/16/04
Tenant

Perform Every 180.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 6.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code TOU-800-TOU **Date Last Edited**

REFER TO BOOK, TOU UNIT: EVERY 6 MONTHS, 1)Grease all valves, using grease and anit-sieze. 2) Inspect burner filters and clean if necessary. ANNUAL, 1) Visual inspection of internal insulation and ceramic supports system. 2) Change oil in in speed reducer. 3) Inspect discharge sleeve of natural gas burner. 4) Inspect spark ignitors of the gas burners. 5) Perform gas shut-off leak test of the natural gas burners. 6) Recalibrate controlls. 7) Internally inspect main and purge fan wheels. 8) Inspect machanical seal in recycle pumps. 9) Drain scrubber tower and inspect sump. 10) Internally inspect scrubber and venturi spray nozzles. [NEXT GREASE JOB ON VALVE IS DUE IN MAR 2000]

Task No. TOU-800-VDM

Description VALVE DRIVE MOTOR-TOU
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. TOU-800-VDM
Equipment Description Valve Drive Motor- 5hp DC Motor
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 7/24/03
Next Due Date 6/ 5/04
Tenant
Perform Every 365.0 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 4.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
8-58-00-01-011	HUB CITY GEAR OIL-DC DRIVE MOTOR-TOU				No

Task Instructions

Instruction Code TOU-800-VDM **Date Last Edited** 6/15/00

Change oil in gear box Yearly: The oil can be emptyed and refilled while the unit is running. There is not need to shut the drive motor off, for it turns slowly.
Use Hub City, synthetic gear oil, in these units. You will use 2 qts of oil.

Task No. TOU-800-VFD
Description GREASE BEARINGS
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. TOU-800-VFD
Equipment Description VAIRABILE FAN DRIVE ON THE TOU
Location THERMAL OXIDATION
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 9/19/03
Next Due Date 9/29/03
Tenant
Perform Every 14.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 46.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At

Item No.	Item Description	Site	Qty	Unit of Measure	Required
4C445	T.O.U./VFD COOLING FAN, 495 CFM BLOWER				No
4C447	T.O.U./ VFD COOLING FAN, 265 CFM BLOWER				No

Task Instructions

Instruction Code TOU-800-VFD **Date Last Edited**

REFER TO BOOK T.O.U. UNIT: 1) Lubricate main fan bearings.(Pillow Blocks) unsing the red grease. Add 8 shots of grease.

EVERY 6TH MONTH: (JUNE,99) Check cooling fans inside of VFD Control Cabnit, Lubricate motor bearings with 10 to 20 drops of SAE 10W or 20W nondetergent oil.

Task No. TP-510
Description TERTIARY PUMPS/OIL LEVELS
Assigned To
WO Type PM
Expense Class
Priority
Multitask No
In-service Task Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. FILTERS
Equipment Description CONTROL CABINENTS
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed
Next Due Date
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed
Down Time
Must Be Down No

Equipment No. TP-510
Equipment Description TERTIARY FILTER FEED PUMP
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 7/24/03
Next Due Date 9/22/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 10.00
Down Time
Must Be Down No

Equipment No. TP-511
Equipment Description TERTIARY FILTER FEED PUMP
Location GROUND TREATMENT
Sub-location 1 BUILDING
Sub-location 2 -
Sub-location 3 -
Date Last Performed 7/24/03
Next Due Date 9/22/03
Tenant
Perform Every 90.00 Day(s)
Schedule Type Fixed
Task Duration
No. of Times Completed 10.00
Down Time
Must Be Down No

Equipment No.	Meter Name	Last Performed At
TP-510	hour	9,606.00
TP-511	hour	9,774.00

Item No.	Item Description	Site	Qty	Unit of Measure	Required
HD-68	TEXACO RANDO HD68				Yes

Task Instructions

Instruction Code TP-510 **Date Last Edited** 7/12/00

REFERE TO FILE DP PUMPS: MONTHLY; ALTERNATE PUMP RUNNING, Also check and tighten packing gland as needed to stop leakage. But remember to leave some leakage for the water luberacaters the seals.
QUARTERLY: Change pump oil every 4000 hours, using Texaco Rando HD68, and grease bearings n drive motor every 4000 hrs.You must remove shield around spider grear to grease motor. sure to remove fill plug, when adding grease.

Task No. VCR-TV-00
Description *ANNUAL INSPECTION AND CLEANING*
Assigned To
Priority 3.00

WO Type | **Multitask** No
Expense Class | **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. VCR-TV-000
Equipment Description VCR/TV SERVICE CONTARCT
Location CONFRENCE ROOM | **Perform Every** 365.0 Day(s)
Sub-location 1 - | **Schedule Type** Fixed
Sub-location 2 - | **Task Duration**
Sub-location 3 - | **No. of Times Completed** 1.00
Date Last Performed 11/ 5/02 | **Down Time**
Next Due Date 11/ 1/03 | **Must Be Down** No
Tenant

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code VCR-TV-000 | **Date Last Edited** 11/22/00

REFURE TO KARL JEAGERS DESK, FOR PERFORMANCE GUARANTEE ON THIS UNIT. THIS GUARANTEE IS A FREE ANNUAL INSPECTION, CLEANING AND MAINTENANCE FOR SELETCED AUDIO/VIDEO EQUIPMENT. CONTACT CIRCUIT CITY AT (800) 861-6832 TO SCHEDULE SERVICE.

Task No. VIB TEST-OO1
Description VIBRATION TEST PERFORMED ON ALL MOTORS
Assigned To JES | **Priority** 3.00
WO Type PM | **Multitask** No
Expense Class | **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. VIB TEST-001
Equipment Description VIBRATION TEST PERFORMED ON MOTORS
Location - | **Perform Every** 365.0 Day(s)
Sub-location 1 - | **Schedule Type** Fixed
Sub-location 2 - | **Task Duration**
Sub-location 3 - | **No. of Times Completed**
Date Last Performed 4/16/03 | **Down Time**
Next Due Date 4/15/04 | **Must Be Down** No
Tenant

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code VIB TEST | **Date Last Edited** 4/16/03

Byron Miller of Wylie Electric motor comes out and performes vibration testing on all motors, listed in the past report. This test is performed once a year in April. You can set up an appt. with Byron by calling 1-616-846-6131

Task No. ACID WAGON
Description ACID INJECTION SYSTEM
Assigned To | **Priority** 3.00
WO Type CLEAN | **Multitask** No
Expense Class | **In-service Task** Yes

Craft	Crew Size	Estimated Labor Hours

Equipment No. ACID WAGON
Equipment Description ACID WAGON-TO INJECT ACID INTO WELLS
Location SLUDGE TREATMENT BUILDING | **Perform Every** 120.0 Day(s)

Sub-location 1	-	**Schedule Type**	Floating
Sub-location 2	-	**Task Duration**	
Sub-location 3	-	**No. of Times Completed**	
Date Last Performed		**Down Time**	
Next Due Date		**Must Be Down**	No
Tenant			

Equipment No.	Meter Name	Last Performed At

Task Instructions

Instruction Code ACID SYSTEM **Date Last Edited** 11/21/03

THIS SYSTEM IS USED TO INJECT ACID INTO WELLS FOR CLEANING.
BRIGGS & STRAATTON ENGINE: Chcek oil level regularly. Be sure correct oil level is maintained. Check every 8 hours or daily.
Change oil after every 50 hrs. of run time using 10w 30 oil, and change oil filter after 100 hrs of usage.
Check and clean air filter monthly as needed.
Replace in line fuel filter, and clean or replace spark plugs, yearly.
For Part Numbers refer to "Tool Operation Manul" look under Briggs & Stratton engine.

STAINLESS STEEL GEAR PUMP; There is not much to do as far as maintenance, but if a seal or gear goes bad it can be replaced by ordering a Gear Repair Kit 43095k61 through McMaster Carr. The pump can be bought through McMaster -Carr part no. 43095k56

BOILER SYSTEM; We have no operation manual on this boiler. But do keep an eye on the coil for leaks, and clean out the water bowl every 6 months.

APPENDIX G

OTT/STORY/CORDOVA GROUNDWATER TREATMENT FACILITY
VENDOR LIST

Ott/Story/Cordova GWTF
Equipment Manufacturer's Representatives

Acid Wash Pump AWP-734
Universal Pump
31643 West Eight Mile Road
Livonia, MI 48152
TEL: 248/474-3077

Acid Wash Tank AWT-731 and Plate Wash Tank PWT-741
Viatec
500 Reed Street
Belding, MI 48809
TEL: 616/794-1230

Air Compressors AC-901, 902, & 903 and AD-904
Compressor Technologies
5180 West River Drive
Comstock Park, MI 49321
TEL: 800/968-4422

Analytical Equipment GC/MS
HEWLETT-PACKARD
39550 Orchard Hill Plaza
Novi, MI 48376
P.O. Box 8024, Novi 48376-8024
TEL: 810/380-2100 -or- 800/477-6444 x 9200 FAX: 810/380-2450
Richard Williams or Roger Tank

Buildings
G.F. Contracting
1864 North Bend Road
Union, MO 63084
TEL: 314/583-4184
John Kleekamp

Carbon Adsorption System & Carbon GAC-551 & 552
CALGON CARBON CORPORATION
4343 Commerce Street/Court, Suite 400
Lisle, IL 60532
TEL: 708/505-1919 FAX: 708/505-1936
Bruce Wilbe, Sales Rep.
Cust. Support (7:30am-7:30pm): 800/648-9005 (After 7:30pm = 412/889-2664)

Centrifugal Air Compressors DB-120 to 122, ASB-220 to 222
INGERSOLL-RAND COMPANY
22122 Telegraph Road
Southfield, MI 48034
TEL: 800/227-7263
Alan Caldwell

Centrifugal Water Pumps DP-540 & 541, TP-510 & 511
GREAT LAKES PUMP
2180-2186 44th Street, Ste. 110
Kentwood, MI 49508
616/455-6336
Dean Foy

Chemical Feed System FC-600 & 601, PAP-630, 631, & 632
RS TECHNICAL SERVICES
13684 Beckwith Drive
P.O. Box 291
Lowell, MI 49331
616/897-7041
Phil Larson

Continuous Backwash Filtration System TF-521, 522, & 523
ANDRITZ
1010 Commercial Blvd. South
Arlington, TX 76017
TEL: 817/465-5611
Fritz Rabler, Service Manager

DAS Bypass Fans
HOWDEN FAN COMPANY/BUFFALO FORGE
c/o Brookside Industrial Equipment
406 West 34th Street
Kansas City, MO 64111
TEL: 816/561-2087
Andrew Muir - Sales Representative

Diaphragm Pumps
WILDEN AIR DIAPHRAGM PUMPS
Air Pump Company
4354 Summer Lane N.E.
Grand Rapids, MI 48505
800/551-5550

Electrical/Instrumentation
Windemuller Electric, Inc.
1176 Electric Avenue
Wayland, MI 49348
TEL: 616/877-8770 (24 hr. service)

Electrical Substations & MCC's
Windemuller Electric, Inc.
1176 Electric Avenue
Wayland, MI 49348
TEL: 616/877-8770

Extraction Well Pumps EXP-1 to 9
Stearns Drilling
6974 Hammond SE
Dutton, MI 49316-9116
TEL: 616/698-7770
Larry Herron

Ferric Chloride Tank FC-602 and Phosphoric Acid Tank PAT-635
Edwards Fiberglass
P.O. Box 1252
Fiberglass Square
Sedalia, MO 65302-1252
TEL: 816/826-3915

Filter Press Feed Pumps FFP-710, 711, 712, & 713
Mullen Equipment
5031 Dorset Lane
Muskegon, MI 49441
TEL: 616/798-3360
Randy Gephart

Firewater Pumphouse Components
UNDERWOOD FIRE EQUIPMENT
P.O. Box 43
Novi, MI 48376
TEL: 810/347-4975
Darrel Underwood or Pat Zuber

Instrumentation
Commerce Controls, Inc.
41069 Vincenti Court
Novi, MI 48375
TEL: 248/476-1442
Jerry Zitterman

Intrusion Detection System
Midstate Security Co.
1208 Butterworth, SW
Grand Rapids, MI 49504
TEL: 800/955-1317
Dianne VanAntwerp

Lab Equipment
Hewlett-Packard
39550 Orchard Hill Plaza
Novi, MI 48376-8024
TEL: 800/477-6444
Roger Tank

Tekmar-Dohrmann
7142 East Kemper Road
P.O. Box 429576
Cincinnati, OH 45242-9576
TEL: 800/874-2004

Leak Detection System
PERMALERT
7720 North Lehigh Avenue
Niles, IL 60714-3491
TEL: 847/966-2190 FAX: 847/470-1204
Sergio Deluca, ext. 2870

Lime Feed System LFS-645
U.S. FILTER/ZIMPRO ENVIRONMENTAL
302 West Military Road
Rothschild, WI 54474
TEL: 715/359-7211 FAX: 715/355-3219
Vernon Wright

Mechanical/HVAC
Holwerda-Huizinga Co.
3470 Raleigh Drive S.E.
P.O. Box 888651
Grand Rapids, MI 49588-8651
TEL: 616/974-1050 (24 hr. service)

Monorail Cranes
Stewart Engineering
2420 Getty Street
Muskegon, MI 49444
TEL: 616/739-2420
Kenneth Stewart

Motorized Slide Gate
Reliable Overhead Door & Gate
1972 S. Maple Island Road
Muskegon, MI 49442
TEL: 616/788-3195
Duane Seaver

Non-Potable Water Booster System NWBS-935
H.V. Burton Co.
30419 Industrial Road
Livonia, MI 48150
TEL: 313/261-4220

NPDES Monitoring Station NMS-651
RS TECHNICAL SERVICES
13684 Beckwith Drive
P.O. Box 291
Lowell, MI 49331
TEL: 616/897-7041
Phil Larson

Overhead Coiling Doors
Muskegon Garage Door
1144 West Dale Avenue
Muskegon, MI 49441-2209
TEL: 616/759-8055
Tim Stone

PACT Storage Silo PCS-660
CHEMICAL METERING SYSTEMS, INC.
700 North Holmes Road
P.O. Box 526
Drexel, MO 64742
TEL: 816/657-2185 FAX: 816/657-2193
Kent Allard or Fred Allard

Painting
Inteco, Inc.
5967 Maple Island Road
Nunica, MI 49448
TEL: 616/865-3177
David Whitlow

Plate Wash Pump PWP-742 Abel
See filter press feed pumps

Polymer Feed System PMP-620, 621, & 622
STRANCO, INC.
Cowles Equipment
11407 36th Street S.E.
Lowell, MI 45331
TEL: 616/897-9456
Curt Cowles

Sewage Lift Station
Kennedy Industries, Inc.
Office: 616/281-5763
Pager: 616/280-0628
J.C. Van Harn

Sludge Pumps RSP-220 to 222, RSP-320 to 322, STP-211 & 212
DETROIT PUMP
306 Mart Street, S.W.
Grand Rapids, MI 49584
616/247-3733
Emergency Beeper: 313/275-5772

Sludge Dewatering System FP-721, 722, & 723
JWI
2155 - 112th Avenue
Holland, MI 49424-9604
TEL: 616/772-9011 FAX: 616/772-4516
Mike Brinks

STB Air Compressors AC-751 & 752
Compressor Technologies
5180 West River Drive
Comstock Park, MI 49321
TEL: 800/968-4422

Submersible Centrif. Pumps SP-130A & 130B, SP-131A & 131B
BERTSCH CO.
1655 Steele Street, S.W.
Grand Rapids, MI 49507
616/452-3251
Mike Boyd

Tanks NFT-401 and ET-531
ROSS TANK CO./RTC ENVIRO-FAB
9043 Plum Orchard Road
Munith, MI 49259-9745
TEL: 517/596-2987 FAX: 517/596-2548
Rod Bubp

Thermal Oxidation System
HUNTINGTON ENVIRONMENTAL SYSTEMS, INC.
707C West Algonquin Road
Arlington Hgts., IL 60005
TEL: 847/545-8800
Darr Pace or Ken Gutowski

APPENDIX H

OTT/STORY/CORDOVA GROUNDWATER TREATMENT FACILITY
SPARE PARTS

SPARE PARTS LIST
OTT/STORY/CORDOVA GWTF

LOCATION	SPARE PART NUMBER	DESCRIPTION	ESTIMATED LIFE IN YEARS	PRICE
Clarifier 301-302	MT-EP-8831-AIR	Spare flowmeter for BB	6-8	$3,095.00
Clarifier 301-302	Not Provided	Shear Pins for C-301,302	5	$12.96
Clarifier 301-302	Not Provided	Parker Cylinder Kit	5	$194.33
Clarifier 301-302	Not Provided	Fairfield Seal	5	$38.87
Clarifier 301-302	Not Provided	Fairfield O-Ring	5	$10.42
Filter Wash Press Pump	52-111-310-005	Casing Gasket-Suction	3-5	$4.35
Filter Wash Press Pump	52-111-311-005	Casing Gasket-Discharge	3-5	$4.35
Filter Wash Press Pump	52-117-117-501	Casing Ring Assembly	2-3	$73.50
Filter Wash Press Pump	CP-751-531-937	Casing Ring O-Ring	2-3	$4.35
Filter Wash Press Pump	CP-751-531-264	Stuff Box O-Ring	2-3	$6.36
Filter Wash Press Pump	52-113-300-006	Bearing	6-8	$12.56
Filter Wash Press Pump	CP-811-443-227	Bearing	6-8	$29.50
Filter Wash Press Pump	CP_819-111-26		6-8	$5.40
Filter Wash Press Pump	CP-819-133-206	Lockwasher, Brg	6-8	$1.40
Filter Wash Press Pump	CP-753-030-535	Grease Seal	7-8	$9.10
Filter Wash Press Pump	52-239-536-501	Shaft Sleeve	5	$123.00
Filter Wash Press Pump	CP-751-531-428	Sleeve O-Ring	5	$0.65
Filter Wash Press Pump	52-328-740-111	Packing Ring	4-5	$1.80
Filter Wash Press Pump	52-117-840-002	Deflector	8	$4.55
Tertiary Pump	985167	Seal Kit	3-4	$116.00
Tertiary Pump	405098	Repair Kit	3-4	$205.00
Carbon	Not Provided	1 Set Rotor Blades	8-10	$125.00
Carbon	Not Provided	1 Qt Synthetic Gear Oil	5	$20.00
Carbon	Not Provided	304L S.S. Cages	8	$81.00
Carbon	Not Provided	Bag Clamp Hex Head	5	$3.00
Carbon	Not Provided	Solid State Timer	5	$448.00

SPARE PARTS LIST
OTT/STORY/CORDOVA GWTF

LOCATION	SPARE PART NUMBER	DESCRIPTION	ESTIMATED LIFE IN YEARS	PRICE
Carbon	Not Provided	Pressure Gauge	2	$96.00
Carbon	M14909	Diaphragm	2	$30.00
Carbon	Not Provided	Diaphragm Repair kit M14909	2	$22.00
Carbon	Not Provided	Solenoid Pilot Valve	3-5	$36.00
Carbon	24F24C2180AAFG-EC05	Solenoid Valve	3-5	$345.00
Carbon	16F24C2164AAF-PH05	Solenoid Valve	3-5	$210.00
GAC	FPSE252	Rupture Disk	10	$88.00
Effluent Sampler	LL1	Air Cylinder	8	$270.00
Effluent Sampler	LL2	Cylinder Support	15	$118.33
Effluent Sampler	LL3	Guide Bar	15	$41.66
Effluent Sampler	LL4	Frame Supports	15	$100.00
Effluent Sampler	LL5	Guide Screw	15	$5.00
Effluent Sampler	LL6	Packing Gland	2	$325.00
Effluent Sampler	LL8	Frame Nuts	6	$6.66
Effluent Sampler	LL9	Packing	4	$118.33
Effluent Sampler	LL10	Packing Lantern	4	$153.33
Effluent Sampler	LL11	Main Housing	15	$555.00
Effluent Sampler	LL14	Cylinder Mounting Bolts	6	$6.66
Effluent Sampler	LL16	Sampling Rod	6	$405.00
Effluent Sampler	LL18	Packing Gland Bolts	6	$6.66
Vault Sump GTB	85209	Pump Overhaul Kit	1	$156.55
PCT-201-202	Not Provided	Shear Pins For PCT 201,202	5	$14.71
PCT-201-202	Not Provided	Parker Cylinder Kit	5	$486.90
PCT-201-202	Not Provided	Fairfield Seal	5	$66.67
PCT-201-202	Not Provided	Fairfield O-Ring	5	$16.89
Vault Sump STB	85210	Pump Overhaul Kit, 131A & B	1	$413.27

SPARE PARTS LIST
OTT/STORY/CORDOVA GWTF

LOCATION	SPARE PART NUMBER	DESCRIPTION	ESTIMATED LIFE IN YEARS	PRICE
Wells	CD674A4988U50	EW Flowmeter Converter	2-3	$1,115.00
Wells	470-206-50-999-3	Butterfly Valve Seats	6-8	$57.93
Wells	230-928-80-100-1	Butterfly Valve Packing	6-8	$56.00
TOU	35773 W/LER Seals	Main Exhaust Fan Bearing (Fixed)	3-4	$601.53
TOU	35773W/LER Seals	Main Exhaust Fan Bearing (Float)	3-4	$601.53
TOU	043-180	Burner Pilot Gas Regulator	4-5	$86.21
TOU	122-8	Burner Gas Train Regulator	4-5	$604.39
TOU	P-335	Purge Fan Bearing (Fixed)	5-6	$236.16
TOU	PE-335	Purge Fan Bearing (Float)	5-6	$326.88
TOU	SB035-4AA2A00AA	Inlet Isolation Valve Actuator	7	$3,143.70
TOU	ADA010-4AA2AODAA	Prestart Purge Damper Actuator	7	$752.04
TOU	PM950ATF-1	DC Valve Drive Motor	7-8	$331.80
TOU	871PH-1F1A	pH Sensor	2	$609.21
TOU	1/2-09-0027-30-K-WB1-1/4-27	Thermocouple	1	$261.12
TOU	316K-375-316-D-30-D-2-Y	Thermocouple	1	$116.28
TOU	P14H1405	Drainage Pump Motor	8	$440.00
TOU	3195CC4AAA20	Pressure Transducer	3	$891.00
TOU	Not Provided	Size 1 Motor Starter Heaters	6-8	$25.92
TOU	Not Provided	Size 2 Motor Starter Heaters	6-8	$25.92
TOU	3878	Fuse, 3A., 500V	1	$12.00
TOU	3866	Fuse, 9A 250V	1	$4.84
TOU	48554	Fuse, 4.5 250V	1	$4.84
TOU	261277.14	Fuse, 400A	1	$56.88

SPARE PARTS LIST
OTT/STORY/CORDOVA GWTF
LAMPS

LOCATION	SPARE PART NUMBER	DESCRIPTION	QUANTITY	ESTIMATED LIFE IN YEARS	PRICE
Outside Entrance Door Lights	GENLU70	Lamp	2	0.5 - 1	$15.22
Outside Standing Floods	GENLU150100	Lamp	2	0.5 - 1	$55.43
Control Panels	GEN755	Lamp	75	0.5 - 1	$0.59
Control Panels	GEN757	Lamp	86	0.5 - 1	$0.61
Alarm Beacons	GEN40S11N1CD120	Lamp	18	0.5 - 1	$2.38
Flourescent Exits	GENF78XSPX2710PK	Lamp	14	0.5 - 1	$2.49
Clear Bulb Exits	GEN15T6145	Lamp	10	0.5 - 1	$2.90
Large Ballasts	GENLU400	Lamp	5	0.5 - 1	$15.22
Small Ballasts	GENLU100MED	Lamp	11	0.5 - 1	$15.22
Rough Service (Silos)	GEN75ARS12PK120	Lamp	2	0.5 - 1	$1.60
Control Panels	GEN120MB	Lamp	35	0.5 - 1	$1.25
Sump Beacons	GEN40A15120	Lamp	2	0.5 - 1	$0.96
48" Overhead Flourescents	GENF40CWRS	Lamp	36	0.5 - 1	$1.25
TOU Flourescents	GENF96	Lamp	4	0.5 - 1	$4.62
48" Flourescent TOU C. Cabinet	GENF32T	Lamp	2	0.5 - 1	$1.68
24" Flourescent TOU C. Cabinet	GENF20T12CW	Lamp	1	0.5 - 1	$3.83
Heat Tracing	SR82A-240V NEON	Lamp	5	0.5 - 1	$2.64
TOU Ballasts	GENMUR400	Lamp	1	0.5 - 1	$30.00
Polymer Control Boards	949 ALBA	Lamp	6	0.5 - 1	$4.50

SPARE PARTS LIST
OTT/STORY/CORDOVA GWTF
FUSES

SPARE PART NUMBER	DESCRIPTION	QUANTITY	ESTIMATED LIFE IN YEARS	PRICE
AGC 1	Fuse	5	0.5 - 1	$0.26
AGC 6	Fuse	6	0.5 - 1	$0.35
AJT 1 1/4	Fuse	10	0.5 - 1	$5.81
AJT 10	Fuse	4	0.5 - 1	$5.81
ATMR 1	Fuse	10	0.5 - 1	$4.30
ATMR 1/2	Fuse	2	0.5 - 1	$4.30
ATMR1 1/2	Fuse	11	0.5 - 1	$4.30
ATMR 20	Fuse	6	0.5 - 1	$4.30
ATQ 2	Fuse	2	0.5 - 1	$4.95
ATQ 3	Fuse	1	0.5 - 1	$4.95
ATQ 5	Fuse	4	0.5 - 1	$4.89
ATQR 1/2	Fuse	4	0.5 - 1	$5.86
ATQR1 8/10	Fuse	4	0.5 - 1	$7.01
ATQR 2	Fuse	10	0.5 - 1	$4.98
ATQR 5	Fuse	6	0.5 - 1	$4.58
ATQR 3/4	Fuse	10	0.5 - 1	$5.59
A13X300-4	Fuse	2	0.5 - 1	$22.07
A50P400-4	Fuse	6	0.5 - 1	$54.98
A2D 15R	Fuse	3	0.5 - 1	$4.05
A6D 70R	Fuse	3	0.5 - 1	$27.03
A6T 70	Fuse	6	0.5 - 1	$19.63
FLNR 25	Fuse	1	0.5 - 1	$1.87
FNA 1/2	Fuse	1	0.5 - 1	$3.76
FNM 4 1/2	Fuse	1	0.5 - 1	$2.68
FNM 9	Fuse	1	0.5 - 1	$2.68

SPARE PARTS LIST
OTT/STORY/CORDOVA GWTF
FUSES

SPARE PART NUMBER	DESCRIPTION	QUANTITY	ESTIMATED LIFE IN YEARS	PRICE
FNQR 1/2	Fuse	1	0.5 - 1	$4.59
FNQR 5	Fuse	2	0.5 - 1	$4.59
FNQR 3/4	Fuse	1	0.5 - 1	$7.01
FNR 15	Fuse	2	0.5 - 1	$1.87
FNR 20	Fuse	2	0.5 - 1	$1.87
FNR 25	Fuse	2	0.5 - 1	$1.87
FWH 400	Fuse	1	0.5 - 1	$36.04
GFN 1/2F	Fuse	2	0.5 - 1	$3.76
GFN 4	Fuse	2	0.5 - 1	$4.75
KLDR 1/2A	Fuse	2	0.5 - 1	$4.59
KTK 5	Fuse	2	0.5 - 1	$4.08
KTK 1 1/2	Fuse	2	0.5 - 1	$4.08
MDL 1/4	Fuse	5	0.5 - 1	$0.82
MDL 5	Fuse	5	0.5 - 1	$0.67
MDL 7	Fuse	5	0.5 - 1	$0.75
OT 2	Fuse	10	0.5 - 1	$1.00
OT 5	Fuse	2	0.5 - 1	$1.64
OT 8	Fuse	1	0.5 - 1	$0.78
OT 10	Fuse	2	0.5 - 1	$0.71
OTM 5	Fuse	2	0.5 - 1	$2.62
OTS 20	Fuse	6	0.5 - 1	$2.91
TRM 1	Fuse	10	0.5 - 1	$1.82
TRM 1 4/10F	Fuse	2	0.5 - 1	$2.30
TRM 2	Fuse	11	0.5 - 1	$1.68
TRM 2 8/10	Fuse	2	0.5 - 1	$2.25

SPARE PARTS LIST
OTT/STORY/CORDOVA GWTF
FUSES

SPARE PART NUMBER	DESCRIPTION	QUANTITY	ESTIMATED LIFE IN YEARS	PRICE
TRM 3	Fuse	10	0.5 - 1	$1.73
TRM 4 1/2	Fuse	4	0.5 - 1	$2.25
TRM 8	Fuse	1	0.5 - 1	$1.73
TRM 20	Fuse	2	0.5 - 1	$1.68
TR1R	Fuse	4	0.5 - 1	$2.47
TR 1 6/10	Fuse	10	0.5 - 1	$2.91
TR2 1/28	Fuse	2	0.5 - 1	$2.55
TR6R	Fuse	2	0.5 - 1	$2.28
TR8R	Fuse	2	0.5 - 1	$2.28
TRS 1 6/10	Fuse	12	0.5 - 1	$6.23
TRS 4R	Fuse	2	0.5 - 1	$4.62
TRS 5R	Fuse	6	0.5 - 1	$4.62
TRS 5 6/10R	Fuse	3	0.5 - 1	$4.62
TRS 10R	Fuse	3	0.5 - 1	$4.62
TRS 12R	Fuse	3	0.5 - 1	$4.62
TRS 17 1/2R	Fuse	4	0.5 - 1	$4.15
TRS 30R	Fuse	3	0.5 - 1	$4.01
TRS 40R	Fuse	10	0.5 - 1	$17.06
TRS 60R	Fuse	2	0.5 - 1	$6.81
TRS 150R	Fuse	6	0.5 - 1	$29.81

PERMIT NO. MI0053309

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Federal Act"), Michigan Act 451, Public Acts of 1994, as amended (the "Michigan Act"), Parts 31 and 41, and Michigan Executive Orders 1991-31, 1995-4 and 1995-18,

Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Post Office Box 30426
Lansing, Michigan 48909-7926

is authorized to discharge from the Ott/Story Superfund Site located at

453 Agard Road
North Muskegon, Michigan 49445

designated as MDEQ-RRD-Ott/Story SF

to the receiving water named the North Channel Muskegon River in accordance with effluent limitations, monitoring requirements and other conditions set forth in this permit.

Unless specified otherwise, all contact with the Michigan Department of Environmental Quality (the "Department") required by this permit shall be made to the Grand Rapids District Supervisor of the Water Division. The Grand Rapids District Office is located at Unit 10, 350 Ottawa N.W., Grand Rapids, Michigan 49503-2341, telephone: 616-356-0500, fax: 616-356-0202. Unless specified otherwise, all Department approvals specified in this permit shall be by the District Supervisor.

Any person who is aggrieved by this permit may file a sworn petition with the Office of Administrative Hearings of the Michigan Department of Environmental Quality, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department may reject any petition filed more than 60 days after issuance as being untimely.

This permit is based on a complete application submitted on May 28, 2002.

This permit takes effect on October 1, 2003. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules. On its effective date this permit shall supersede NPDES Permit No. MI0053309, expiring October 1, 2002.

This permit and the authorization to discharge shall expire at midnight, October 1, 2007. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application which contains such information and forms as are required by the Department by April 4, 2007.

Issued June 18, 2003.

Daniel Dell ACTING

D. Steven Eldredge
Chief, Surface Water Permits Section
Water Division

PART I

Section A. Effluent Limitations And Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 1.728 MGD of treated groundwater from Monitoring Point 001A through Outfall 001 to the North Channel Muskegon River. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Frequency of Analysis	Sample Type
	Monthly	Daily	Units	Monthly	Daily	Units		
INFLUENT MONITORING AND REPORTING								
1,1,1-Trichloroethane	---	---	---	(report)	(report)	mg/l	2X/Month	Grab
1,1-Dichloroethane	---	---	---	(report)	(report)	mg/l	2X/Month	Grab
1,2-Dichloroethane	---	---	---	(report)	(report)	mg/l	2X/Month	Grab
Benzene	---	---	---	(report)	(report)	mg/l	2X/Month	Grab
Total Mercury	---	---	---	---	(report)	ng/l	2X/Year	Grab
DISCHARGE LIMITATIONS, MONITORING AND REPORTING								
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
$CBOD_5$	---	---	---	(report)	(report)	mg/l	Weekly	24-Hr Composite
Ammonia Nitrogen (as N)	---	---	---	(report)	(report)	mg/l	3X/Week	24-Hr Composite
Total Suspended Solids	---	---	---	(report)	(report)	mg/l	3X/Week	24-Hr Composite
Purgeable Halocarbons (excluding Methylene Chloride and 2-Chloroethylvinyl Ether)	---	---	---	---	(report)	ug/l	2X/Month	Grab
The permittee shall analyze for all purgeable halocarbon pollutants with the exception of Methylene Chloride and 2-Chloroethylvinyl Ether, using U.S. EPA Test Method 624 or approved alternate. The permittee shall report all Method 624 parameters.					No individual pollutant concentration shall exceed five (5) ug/l as a daily maximum limit. See Part I.A.4.			
Purgeable Aromatics	---	---	---	---	(report)	ug/l	2X/Month	Grab
The permittee shall analyze for all purgeable aromatic pollutants using U.S. EPA Test Method 624 or approved alternate. The permittee shall report all Method 624 parameters.					No individual pollutant concentration shall exceed five (5) ug/l as a daily maximum limit. See Part I.A.4.			
Total Phosphorus (as P)	7	---	lbs/day	0.5	---	mg/l	3X/Week	24-Hr Composite
Total Copper	---	---	---	---	(report)	ug/l	Quarterly	24-Hr Composite
Amenable Cyanide	---	---	---	---	(report)	ug/l	2X/Month	Grab
Total Mercury	---	---	---	---	(report)	ng/l	2X/Year	Grab
Equipment Inspection	(report)	---	---	---	---	---	3X/Week	Visual
Outfall Observation	(report)	---	---	---	---	---	Weekly	Visual
				Minimum Daily	Maximum Daily			
pH	---	---	---	6.5	9.0	S.U.	Monthly	Grab

PART I

Section A. Effluent Limitations And Monitoring Requirements

a. BAT Treatment
This permit is based on the permittee providing activated carbon treatment. If treatment other than activated carbon is proposed, the permittee shall amend the application received on May 28, 2002. The permit may then be modified to include additional effluent limitations to protect water quality in accordance with applicable rules and regulations.

b. Narrative Standard
The receiving water shall contain no unnatural turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits as a result of this discharge.

c. Monitoring Locations
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to treatment for all influent monitoring and after treatment but prior to mixing with any other waste stream for all effluent monitoring.

d. Monitoring Frequency
The permittee may request a reduction in monitoring frequency. This request shall be submitted to the Department. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.1. of this permit. The monitoring frequency shall not be reduced to less than once per month. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

e. Total Mercury Testing Requirements
The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry". The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is strongly recommended. Guidance for clean technique sampling is contained in: EPA Method 1669, *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance),* EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

f. Outfall Observation
Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.

g. Water Treatment Additives
This permit does not authorize the discharge of water additives without approval from the Department. Approval of water additives is authorized under separate correspondence. Water additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. In the event a permittee proposes to discharge water additives, including an increased discharge concentration of a previously approved water additive, the permittee shall submit a request to the Department for approval. See Part I.A.2. for information on requesting water treatment additive use.

PART I

Section A. Effluent Limitations And Monitoring Requirements

2. Request for Discharge of Water Treatment Additives

In the event a permittee proposes to discharge water additives, the permittee shall submit a request to discharge water additives to the Department for approval. Such requests shall be sent to the Surface Water Quality Assessment Section, Water Division, Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan 48909, with a copy to the Department contact listed on the cover page of this permit. Instructions to submit a request electronically may be obtained via the Internet (http://www.michigan.gov/deq and on the left side of the screen click on Water, Water Quality Monitoring, and Assessment of Michigan Waters; then click on the Water Treatment Additive List which is under the Information banner). Written approval from the Department to discharge such additives at specified levels shall be obtained prior to discharge by the permittee. Additional monitoring and reporting may be required as a condition for the approval to discharge the additive.

A request to discharge water additives shall include all of the following water additive usage and discharge information:

a. Material Safety Data Sheet;

b. the proposed water additive discharge concentration;

c. the discharge frequency (i.e., number of hours per day and number of days per year);

d. the monitoring point from which the product is to be discharged;

e. the type of removal treatment, if any, that the water additive receives prior to discharge;

f. product function (i.e. microbiocide, flocculant, etc.);

g. a 48-hour LC_{50} or EC_{50} for a North American freshwater planktonic crustacean (either *Ceriodaphnia sp., Daphnia sp., or Simocephalus sp.*); and

h. the results of a toxicity test for one other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of Rule 323.1057(2) of the Water Quality Standards.

Prior to submitting the request, the permittee may contact the Surface Water Quality Assessment Section by telephone at 517-335-1180 or via the Internet at the address given above to determine if the Department has the product toxicity data required by items g. and h. above. If the Department has the data, the permittee will not need to submit product toxicity data.

3. Analytical Methods and Detection Limits

The sampling procedures, preservation and handling, and analytical protocol for compliance monitoring for any provisions of this permit shall conform to regulations published pursuant to Section 304(h) of the Act, under which such procedures may be required. The lowest possible generally available analytical detection limits shall be used unless higher levels are appropriate because of sample matrix interference. Upon approval of the Department, the permittee may use alternate analytical methods (for parameters with methods specified in 40 CFR 136, the alternate methods are restricted to those listed in 40 CFR 136).

PART I

Section A. Effluent Limitations And Monitoring Requirements

4. Purgeable Halocarbon and Purgeable Aromatic Limitations

The permittee may request modification of the final limits for the purgeable halocarbon and purgeable aromatic contained in this permit by demonstrating that higher limits are acceptable. To be successful such demonstration must be consistent with the terms of 40 CFR 122.62, 301(b) and 402(o) of the Act and Rules 57(2) to (4) and 1098 of the Michigan Act and be based on new information which was not available at the time of permit issuance (and is not the result of revised regulations, guidance, or test methods). New information includes, but is not limited to data developed during trial, startup and operation of the treatment system. As a supplement to new information, previously available information may also be used as part of the demonstration. If the demonstration is successful, the permit may then be modified after public notice and Department approval of the recommended permit modification in accordance with applicable laws and rules. This demonstration will be considered information which was not available at the time of permit issuance. The modification request must include the following information:

a. In order to ensure that the necessary water quality based conditions are included in the modified permit, the permittee must demonstrate that the organic chemical pollutants not specifically identified in the application are either:

   1) consistently below detection (detection is defined as 50% of the internal standards used in the GC/MS methods 624 and 625 scan); or

   2) specifically identified, their expected ranges of concentrations in the effluent provided, and sufficient toxicity information available to determine that water quality will be protected; or

   3) generally identified, including identifiable characteristics of the unknown compounds, their relationship to general types of compounds and their range of concentrations provided to the extent necessary to determine that water quality will be protected.

b. In order to ensure that the necessary treatment-based conditions are included in the modified permit, the permittee must demonstrate that the differences at this facility justify a higher treatment-based limit for purgeable halocarbons and purgeable aromatics. Factors to be considered include: Flow volume being treated; influent concentrations; cost of treatment, including economic achievability; treatment system efficiency; variability of the effluent; physical limitations in the operation of the treatment system; and other factors that may be appropriate.

PART I

Section A. Effluent Limitations And Monitoring Requirements

5. Additional Influent and Discharge Monitoring and Reporting Requirements

The permittee shall conduct additional monitoring of the influent and discharge for the analytes, at the frequency, with the sample type and analytical method specified below.

Analyte	Sample Type	Sample Frequency	Analytical Method
Influent:			
Organochlorine Pesticides and PCBs [1]	24-Hr Composite	2X/Year	608
Purgeables [2]	Grab	2X/Year	624
Base/Neutrals and Acids [3]	24-Hr Composite	2X/Year	625
Discharge:			
Organochlorine Pesticides and PCBs [1]	24-Hr Composite	4X/Year	608
Base/Neutrals and Acids [3]	24-Hr Composite	4X/Year	625

[1] The list of priority pollutant analytes does not need to include PCBs.

[2] The analytes shall also include tetrahydrofuran.

[3] The list of priority pollutant analytes shall include Tables 1, 2, and 3 in 40 CFR 136, Appendix A, Method 625. The analytes shall also include tetramethylurea but do not need to include PCBs and any of the chlorinated chemicals or pesticides that are analytes specified in method 608.

Staff of the Department shall be provided the opportunity to split samples upon request. The samples shall be analyzed using the specified methods unless alternate analytical methods have been approved by the Department in accordance with Part I.A.3. of this permit. Analyses with these scan methods shall identify and report the method specific EPA priority pollutants present and any other identifiable or significant unidentified peaks. For each identified peak, the concentration shall be provided based on comparison with an existing internal standard. For any significant unidentified peaks, the permittee shall attempt to identify the compound and estimate the concentration associated with these peaks of tentatively identified compounds (TIC). The tasks of peak identification and concentration estimation shall be performed in accordance with the best professional judgment of an analyst with expertise in GC or GC/MS techniques as applicable to the specific scan methodology. A significant unidentified peak shall be considered to be any peak with a response that is greater than 50% of an appropriate internal standard used in the methods 608, 624, and 625 scans.

The analytical results from the twice per month method 624 scans of the discharge specified in Part I.A.1. of this permit shall be submitted as attachments to the monthly Discharge Monitoring Reports (DMR). Additionally, the positive analytical results of the influent and discharge scans shall be summarized and submitted annually as attachments to the December monthly DMRs. The organic scan data generated during this permit cycle also shall be summarized and included in the next permit application. The permit application organic chemical summary shall include the number of samples analyzed for each matrix and type of scan, a list of the chemicals and TICs detected in the specified influent and discharge samples, the number of times each chemical was detected, and a list of the concentrations reported for each of the chemicals determined to be present in the influent and discharge samples.

PART I

Section A. Effluent Limitations And Monitoring Requirements

6. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

a. The facility contact shall be (or a duly authorized representative of this person):
- for a corporation, a principal executive officer of at least the level of vice president, or a designated representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the permit application or other NPDES form originates,
- for a partnership, a general partner,
- for a sole proprietorship, the proprietor, or
- for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.

b. A person is a duly authorized representative only if:
- the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
- the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section obviates the permittee from properly submitting reports and forms as required by law.

7. Discharge to the Groundwaters

This site is a known source of groundwater pollution. The reissuance of this permit does not authorize any discharge to the groundwaters or venting of contaminated groundwaters to the surface waters, nor does it constitute a release of liability for any groundwater contamination at or around the site. The state reserves its rights to seek remedies to abate any groundwater contamination.

PART II

Section A. Definitions

This list of definitions may include terms not applicable to this permit.

Acute toxic unit (TU_a) means $100/LC_{50}$ where the LC_{50} is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Chronic toxic unit (TU_c) means 100/MATC or $100/IC_{25}$, where the maximum acceptable toxicant concentration (MATC) and IC_{25} are expressed as a percent effluent in the test medium.

Class B Biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Daily concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the quantification limit, regard that value as zero when calculating the daily concentration. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations (except for pH and dissolved oxygen). When required by the permit, report the maximum calculated daily concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the Discharge Monitoring Reports (DMRs).

For pH, report the maximum value of any individual sample taken during the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs and the minimum value of any individual sample taken during the month in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. For dissolved oxygen, report the minimum concentration of any individual sample in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Department means the Michigan Department of Environmental Quality.

Detection Level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

PART II

Section A. Definitions

Fecal coliform bacteria monthly is the geometric mean of the samples collected in a calendar month (or 30 consecutive days). The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

Fecal coliform bacteria 7-day is the geometric mean of the samples collected in any 7-day period. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Flow Proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

Grab sample is a single sample taken at neither a set time nor flow.

IC_{25} means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference.]

Land Application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

MGD means million gallons per day.

Monthly frequency of analysis refers to a calendar month. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Monthly concentration is the sum of the daily concentrations determined during a reporting month (or 30 consecutive days) divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

PART II

Section A. Definitions

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined in the reporting month (or 30 consecutive days). The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMRs.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Federal Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

NOAEL means the highest tested dose or concentration of a substance that results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact Cooling Water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

POTW is a publicly owned treatment works.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly frequency of analysis refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Toxicity Reduction Evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

PART II

Section A. Definitions

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of Act No. 451 of the Public Acts of 1994, as amended, being Rules 323.1041 through 323.1117 of the Michigan Administrative Code.

Weekly frequency of analysis refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Yearly frequency of analysis refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

24-Hour Composite sample is a flow proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period.

3-Portion Composite sample is a sample consisting of three equal volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

7-day loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during any 7 consecutive days in a reporting month. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Preventing Pollution is the Best Solution

The Michigan Department of Environmental Quality (DEQ) encourages you to consider pollution prevention alternatives. In some cases pollution prevention may allow you to avoid the need to discharge pollutants which would otherwise require permit limitations -- or even avoid the need for permits altogether! Pollution prevention can:

- ☑ Save Money
- ☑ Reduce Waste
- ☑ Aid Permit Compliance
- ☑ Protect Our Environment
- ☑ Improve Corporate Image
- ☑ Reduce Liability

The DEQ is helping Michigan's industries save money, reduce waste and protect our environment through pollution prevention. DEQ staff can provide pollution prevention assistance through telephone consultations, technical workshops and seminars, and informational publications. They can also put you directly in touch with local support networks and national pollution prevention resources. For more information, contact the Michigan Department of Environmental Quality, Environmental Science and Services Division, at 1-800-662-9278 or visit our homepage at http://www.michigan.gov/deq.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Federal Act (40 CFR Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. Requests to use test procedures not promulgated under see 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Chief of the Surface Water Permits Section, Water Division, Michigan Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan, 48909-7773. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-up Notification

If the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department within 14 days following the effective date of this permit, and then 60 days prior to the commencement of the discharge.

2. Submittal Requirements for Self-Monitoring Data

Unless instructed on the effluent limits page to conduct "retained self-monitoring," the permittee shall submit self-monitoring data on the Environmental Protection Agency's Discharge Monitoring Report (DMR) forms (monthly summary information) and the Department's Daily Discharge Monitoring Report forms (daily information) to PCS-Data Entry, Water Division, Michigan Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan, 48909-7773, for each calendar month of the authorized discharge period(s). The forms shall be postmarked no later than the 10th day of the month following each month of the authorized discharge period(s).

Alternative Daily Discharge Monitoring Report formats may be used if they provide equivalent reporting details and are approved by the Department. For information on electronic submittal of this information, contact the Department.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Water Division, Michigan Department of Environmental Quality (in the case of hospitals, nursing homes and extended care facilities, to the staff of the Division of Health Facilities and Services, Michigan Department of Consumer and Industry Services). Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10th of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the Michigan Act or Rule 35 of the Mobile Home Park Commission Act (Act 96 of the Public Acts of 1987) for assurance of proper facility operation shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

PART II

Section C. Reporting Requirements

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Federal Act, Parts 31 and 41 of the Michigan Act, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-hour reporting - Any noncompliance which may endanger health or the environment (including maximum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.

b. other reporting - The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the first page of this permit, or if the notice is provided after regular working hours call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706 (calls from out-of-state dial 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

8. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset, shall notify the Department by telephone within 24-hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. that the permitted wastewater treatment facility was, at the time, being properly operated; and

c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

PART II

Section C. Reporting Requirements

9. Bypass Prohibition and Notification

a. Bypass Prohibition - Bypass is prohibited unless:

1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and

3) the permittee submitted notices as required under 9.b. or 9.c. below.

b. Notice of Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 9.a. above.

c. Notice of Unanticipated Bypass - The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated on the first page of this permit (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

d. Written Report of Bypass - A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations - The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.10. of this permit.

f. Definitions

1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, within 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

PART II

Section C. Reporting Requirements

11. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under Rule 323.1098 (Antidegradation) of the Water Quality Standards or b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.12.; and 4) the action or activity will not require notification pursuant to Part II.C.10. Following such notice, the permit may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

12. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of Rules 323.1098 and 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

13. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Department 30 days prior to the actual transfer of ownership or control.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the Michigan Act and/or the Federal Act and constitutes grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of an application for permit renewal.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the Michigan Act.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or

b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code). For a Publicly Owned Treatment Work (POTW), these facilities shall be approved under Part 41 of the Michigan Act.

PART II

Section D. Management Responsibilities

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit or other pollutants) removed from or resulting from treatment or control of wastewaters, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the Michigan Act, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Treatment System Closure

In the event that discharges from a treatment system are planned to be eliminated, the permittee shall submit a closure plan to the Department for approval. The closure plan shall include characterization of any wastewater and residuals which will remain on-site after the discharges are eliminated, along with disposal methods, proposed schedule, and any other relevant information as required by the Department. Closure activities involving waste treatment residuals shall be consistent with Part II.D.7. of this permit.

The permittee shall implement the closure activities in accordance with the approved plan. Any wastewater or residual disposal inconsistent with the approved plan shall be considered a violation of this permit. After proper closure of the treatment system, this permit may be terminated.

9. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department or the Regional Administrator, upon the presentation of credentials:

a. to enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

10. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Act and Rule 2128 (Rule 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Federal Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Act and Sections 3112, 3115, 4106 and 4110 of the Michigan Act.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the Michigan Act.

2. Facility Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities. Approval for such construction for a POTW must be by permit issued under Part 41 of the Michigan Act. Approval for such construction for a mobile home park, campground or marina shall be from the Water Division, Michigan Department of Environmental Quality. Approval for such construction for a hospital, nursing home or extended care facility shall be from the Division of Health Facilities and Services, Michigan Department of Consumer and Industry Services upon request.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Federal Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Federal Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits or approvals as may be required by law.

APPENDIX J

PIPE COLOR CODES FOR THE

OTT/STORY/CORDOVA GROUNDWATER

TREATMENT FACILITY

TABLE I: PIPE COLOR CODES

OTT/STORY/CORDOVA GROUND WATER TREATMENT SYSTEM

COLORS INDICATED AS FOLLOWS: (BAND or PIPE COLOR / LEGEND COLOR)

DESCRIPTION	SYM	Required Color Codes	
		COLORS (4)	LEGEND (2)
AIR/GAS/VAPOR			
ambient air (intake)	-	green/white	AMB. AIR
compressed air	#A	safety blue/white	COMP. AIR
process compressed air	CA	safety blue/white	COMP. AIR
natural gas	G	safety yellow/black	NAT. GAS
lab gas	LG	safety yellow/black	NAT. GAS
corrosive vent (lab)	CV	safety yellow/black	COR. VENT
process off gas	OG	silver/yellow	OFF GAS
vent to atmosphere	-	safety yellow/black	VENT
CHEMICAL FEEDS			
acid wash	AW	safety yellow/black	ACID WASH
caustic (sodium hydroxide)	SH	safety yellow/black	CAUSTIC
ferric chloride	FE	safety yellow/black	FERRIC CHL.
lime	L	lime/black	LIME
phosphoric acid	PA	chrm yellow/black	PHOS. ACID
powdered activated carbon	PAC	safety yellow/black	P.A. CARBON
polymer	PM	safety yellow/black	POLYMER
overflow	OF	(3)	(3)
PROCESS FLOWS			
ground water (main process)	GW	safety orange/black	GRD H2O
treated water (main process)	TW	safety orange/black	TRD H2O
treated water (plant recycle)	TW	purple/white	BK WASH
backwash	BW	purple/white	TRD RECYCLE
filtrate	F	safety yellow/black	FILTRATE
potable process water	PPW	dk green/white	POT CLD H2O

DESCRIPTION	SYM	Required Color Codes	
		COLORS (4)	LEGEND (2)
SERVICE WATER			
domestic cold water	DCW	dk green/white	POT CLD H2O
domestic hot water	DHW	safety yellow/black	POT HOT H2O
non-potable cold water	NPW	purple/white	NONPOT H2O
fire protection water	FW	red/white	FIRE H2O
High Pressure filter press washline	HPFP	safety yellow	F.P. WASHLINE
SOLIDS TREATMENT FLOWS			
filter press feed	FF	safety yellow/black	FILTER FD.
sludge	SL	safety yellow/black	SLUDGE
waste activated sludge	WAS	safety yellow/black	SLUDGE
return activated sludge	RAS	safety yellow/black	SLUDGE
scum	SC	safety yellow/black	SCUM
DRAINS			
process drain	D	safety yellow/black	DRAIN
corrosive waste	CW	safety yellow/black	CORR. WASTE
floor drain	SAN	safety yellow/black	DRAIN
sanitary (to leach field)	SAN	purple/white	SANITARY
AIR CONDITIONERS			
refrigerant suction	RS	safety yellow/black	REFRIG
refrigerant return	RL	safety yellow/black	REFRIG
condensate		gray/black	CONDENSATE

NOTES:

(1) The second column shows abbreviations used in the contract drawings.

(2) All pipe legends shall include arrows indicating the direction of flow.

(3) Overflow lines bear the color and legend of the fluid carried.

(4) Fiberglass, stainless steel and galvinized surfaces shall remain unpainted. Apply color codes with adhesive backed identification markers with appropriate legends.

(5) The fittings in galvanized lines carrying fire protection water will be painted red.