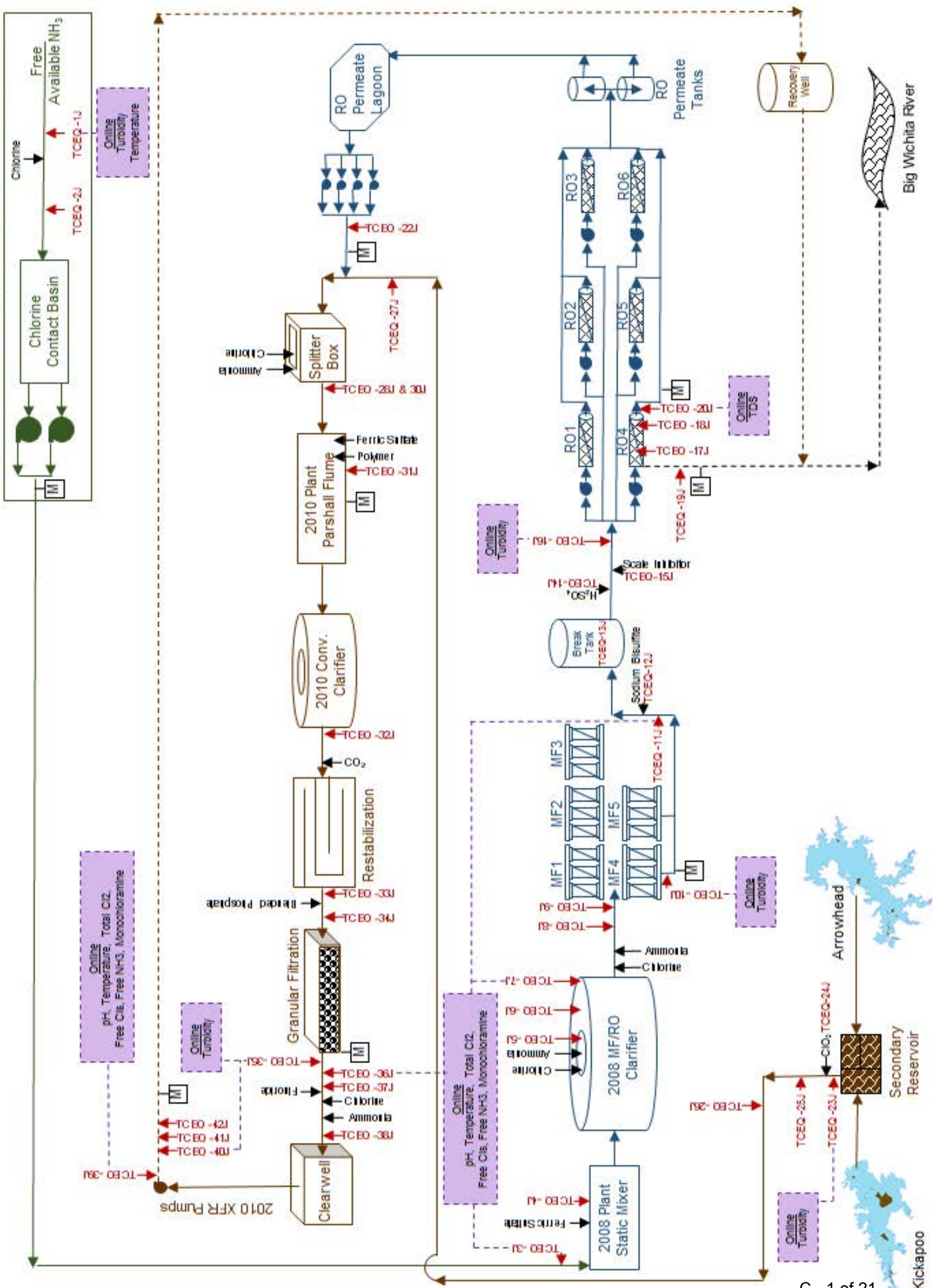


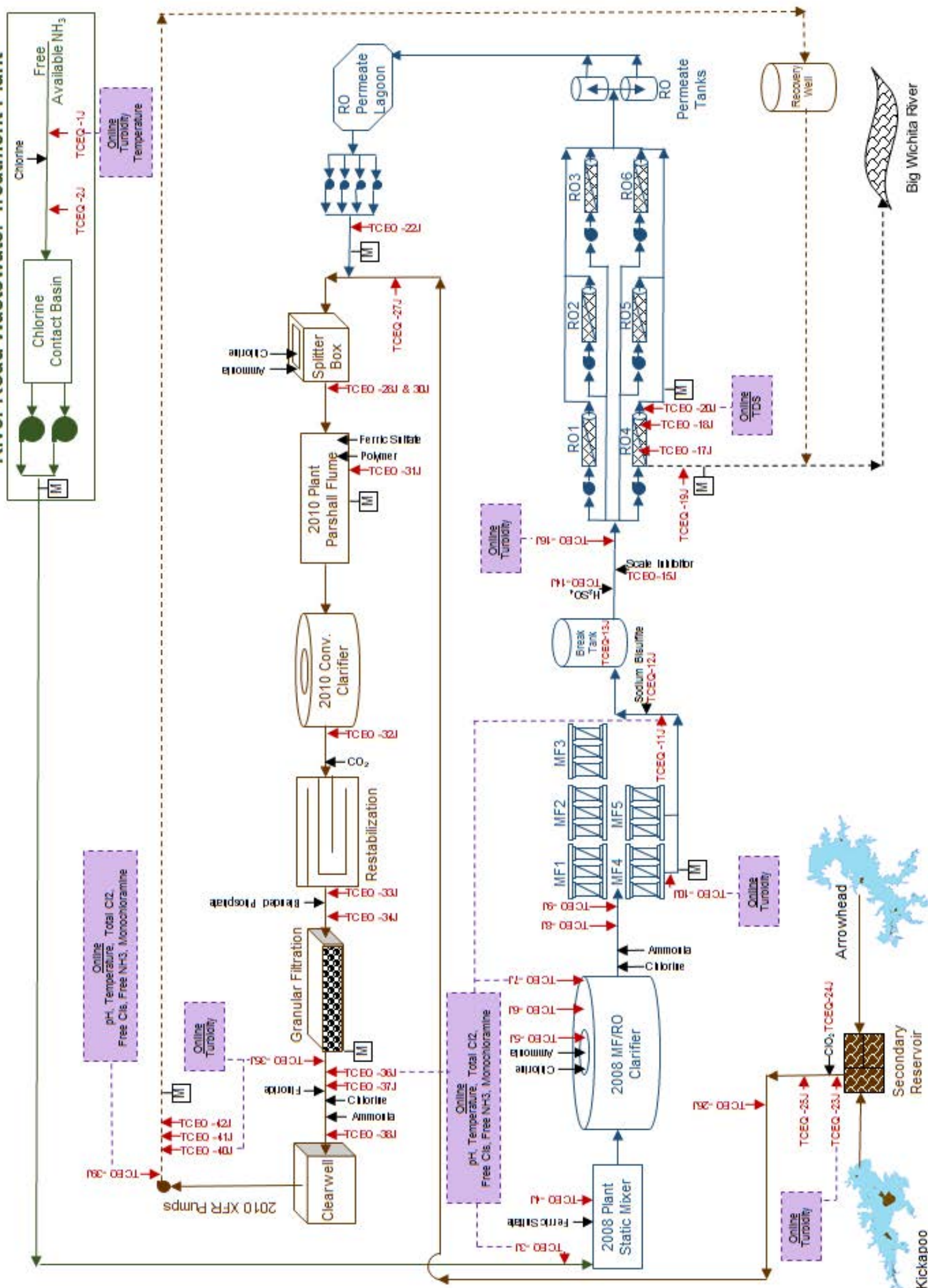
Treatment Train Schematic for Wichita Falls FSV

River Road Wastewater Treatment Plant



Treatment Train Schematic for Wichita Falls FSV

River Road Wastewater Treatment Plant



DATE	3/20/03
BY	CYPRESS WTP

CONNECTION TO FLOW CONTROL VAULT
YARD PIPING - PHASE 1

CYPRESS WTP EXPANSION
WICHITA FALLS, TEXAS

CH2MHILL



VERIFY SCALE
DATE IS ONE INCH ON
ORIGINAL DRAWING
IF THIS SHEET ADJUST
BY 1/4" = 1'-0"

BY DATE

REVISION

NO. DATE

ISSN: SMJ

PR: FAW

CHK: SKJ

APPD: KDM

6/30/03

1

2

3

4

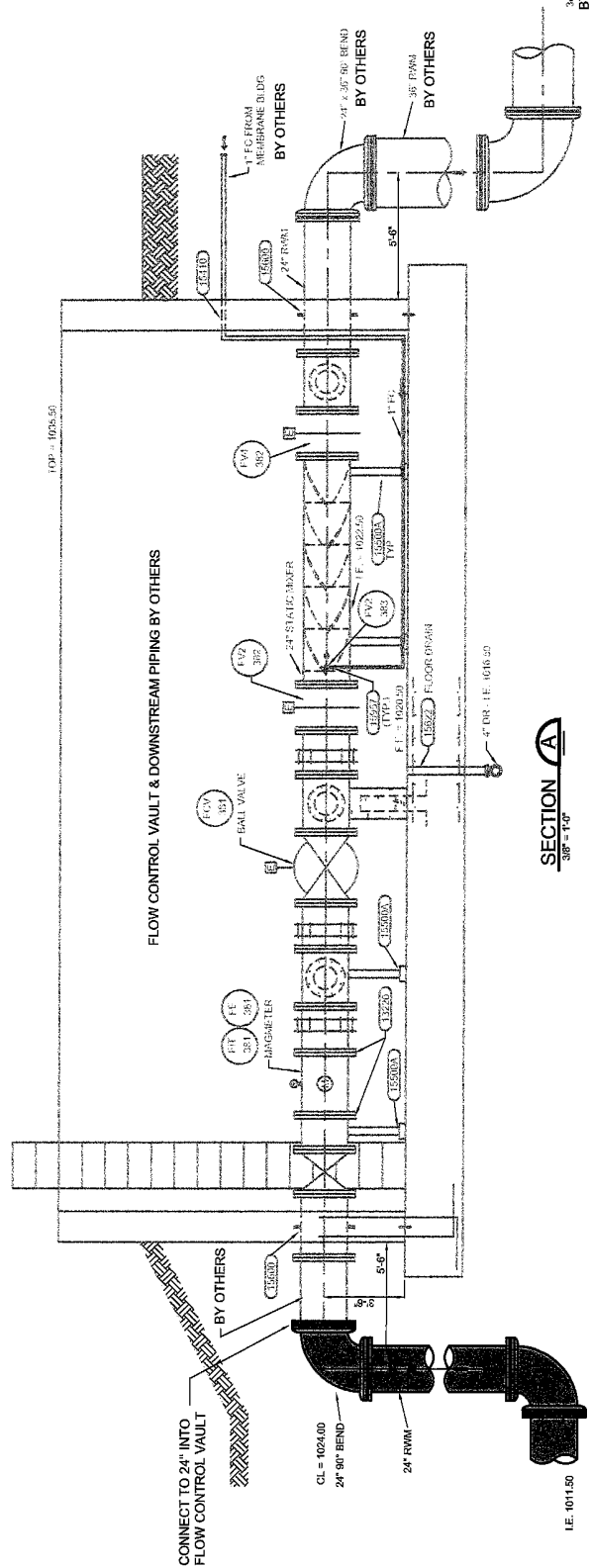
5

6

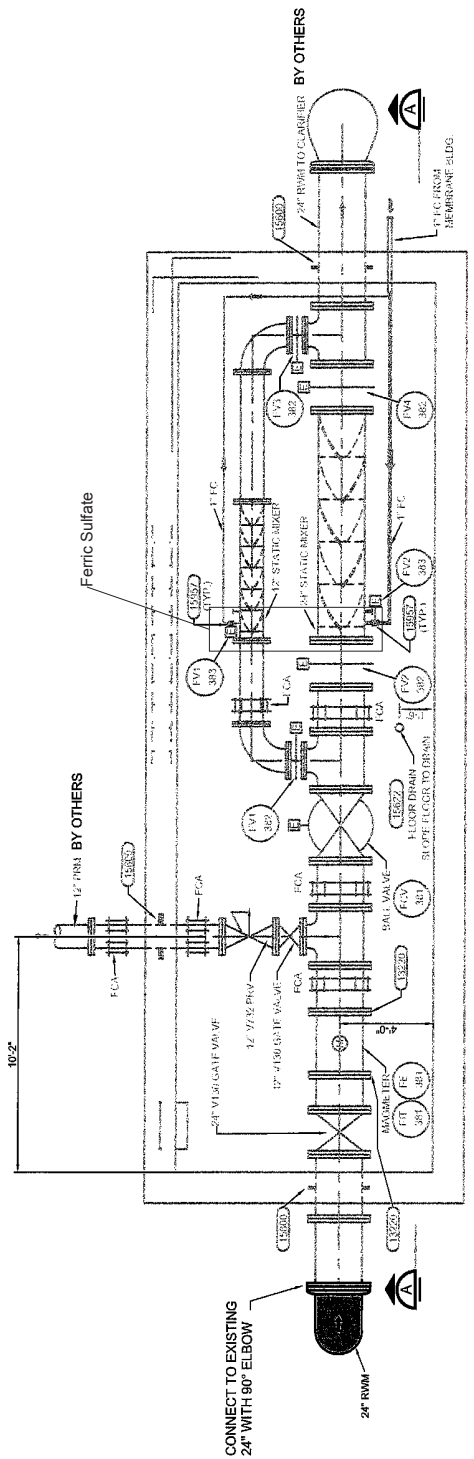
7

8

SECTION A
38" = 1'-0"



FCV VAULT - PLAN
38" = 1'-0"



DATE	4-S-2
DATE	SEPT 2002
PROJ	159951 CD
14-AUG-2002	20:00:08 9951403025.dgn

STRUCTURAL
MEMBRANE BUILDING
PARTIAL FOUNDATION PLAN

CYPRESS WTP EXPANSION
WICHITA FALLS, TEXAS

CH2MHILL



VERIFY SCALE
DATE IS ONE INCH ON
THIS PLAN. ALL DIMENSIONS
SHOWN ON THIS PLAN SHALL BE
IN FEET AND INCHES. ALL
DIMENSIONS SHALL BE
AS SHOWN ON THIS PLAN.
SCALES ACCORDINGLY.

BY: JAP/DO
REVISION

NO. DATE

1 11-11-02

2 4-5-02

3 4-5-02

4 4-5-02

5 4-5-02

6 4-5-02

7 4-5-02

8 4-5-02

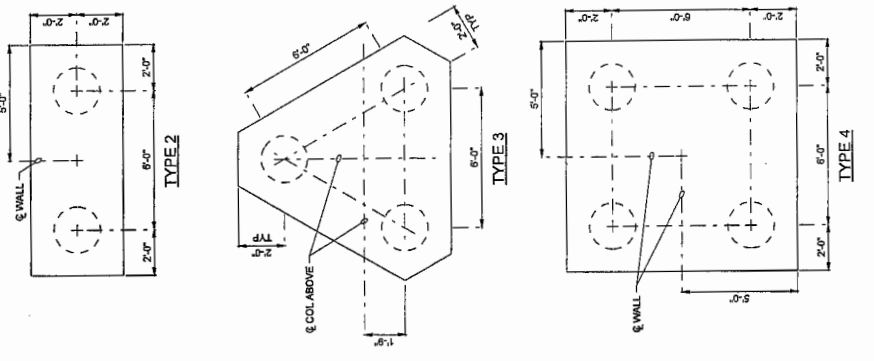
9 4-5-02

10 4-5-02

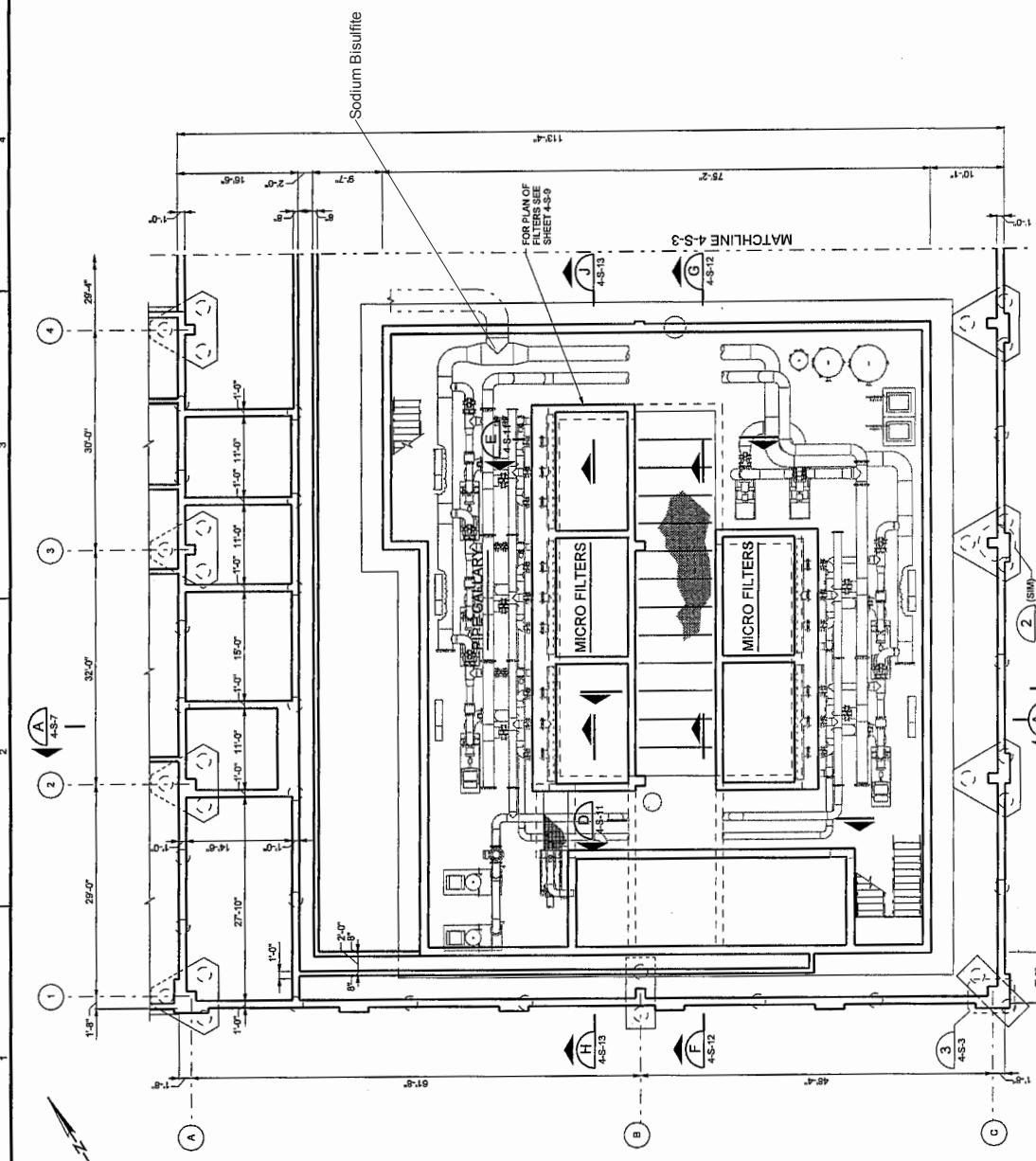
11 4-5-02

12 4-5-02

PIER CAP DETAILS 1/4-S-1



- NOTE:
1. FOR PARTIAL PLAN OF MICRO FILTERS SEE DWG 4-S-2
 2. FOR PARTIAL PLAN OF CHEMICAL CONTAINER AREA SEE DWG 4-S-1B
 3. PIER CAPS ARE 2'-0" THICK
 4. FOR PIER DETAILS SEE (335)
 5. PROVIDE 6" VOID BOXES UNDER PIER CAP PER (335) SIM
 6. REINF PIER CAPS W/ #6@8" EW, TOP & BOTTOM

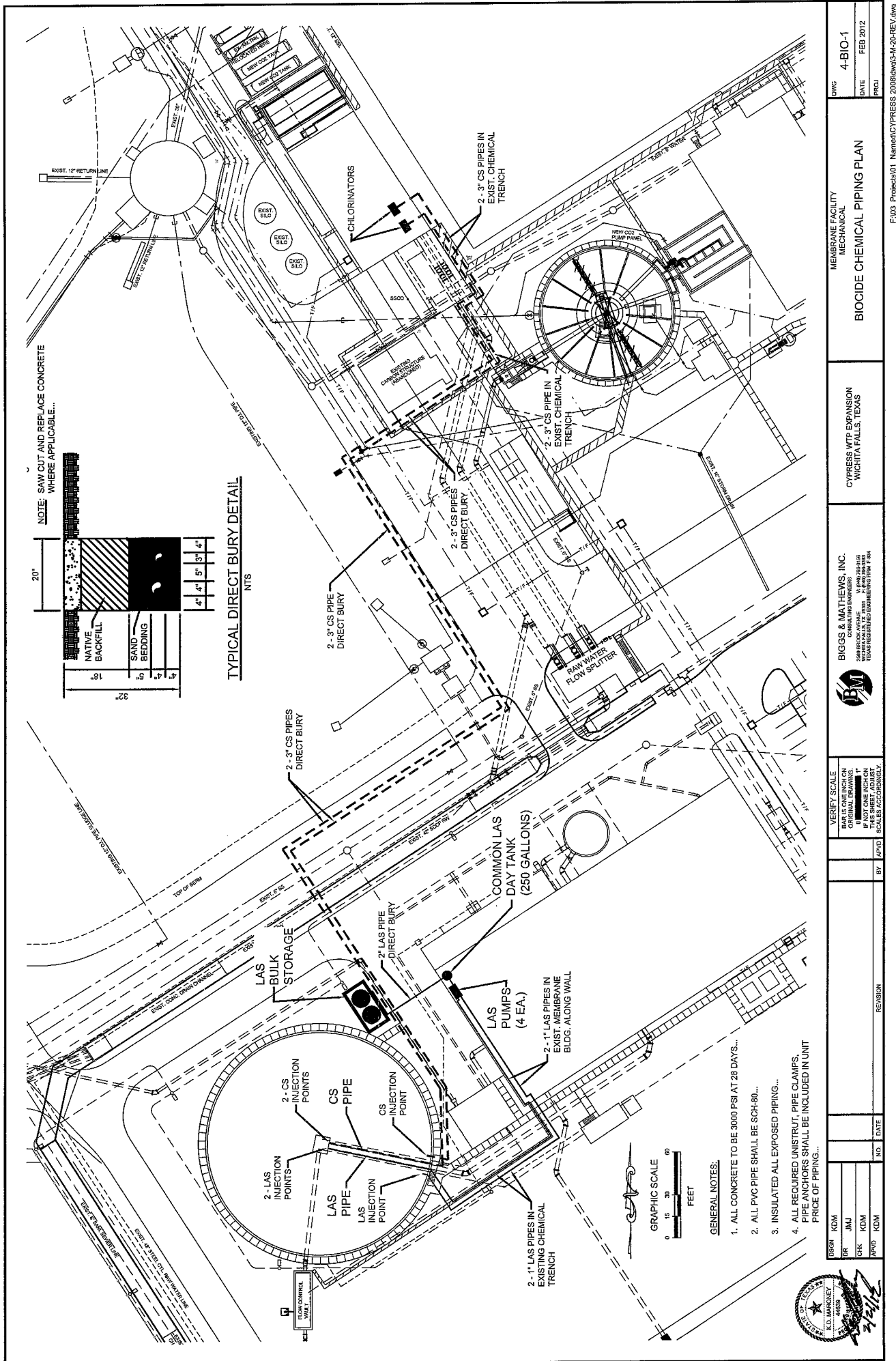


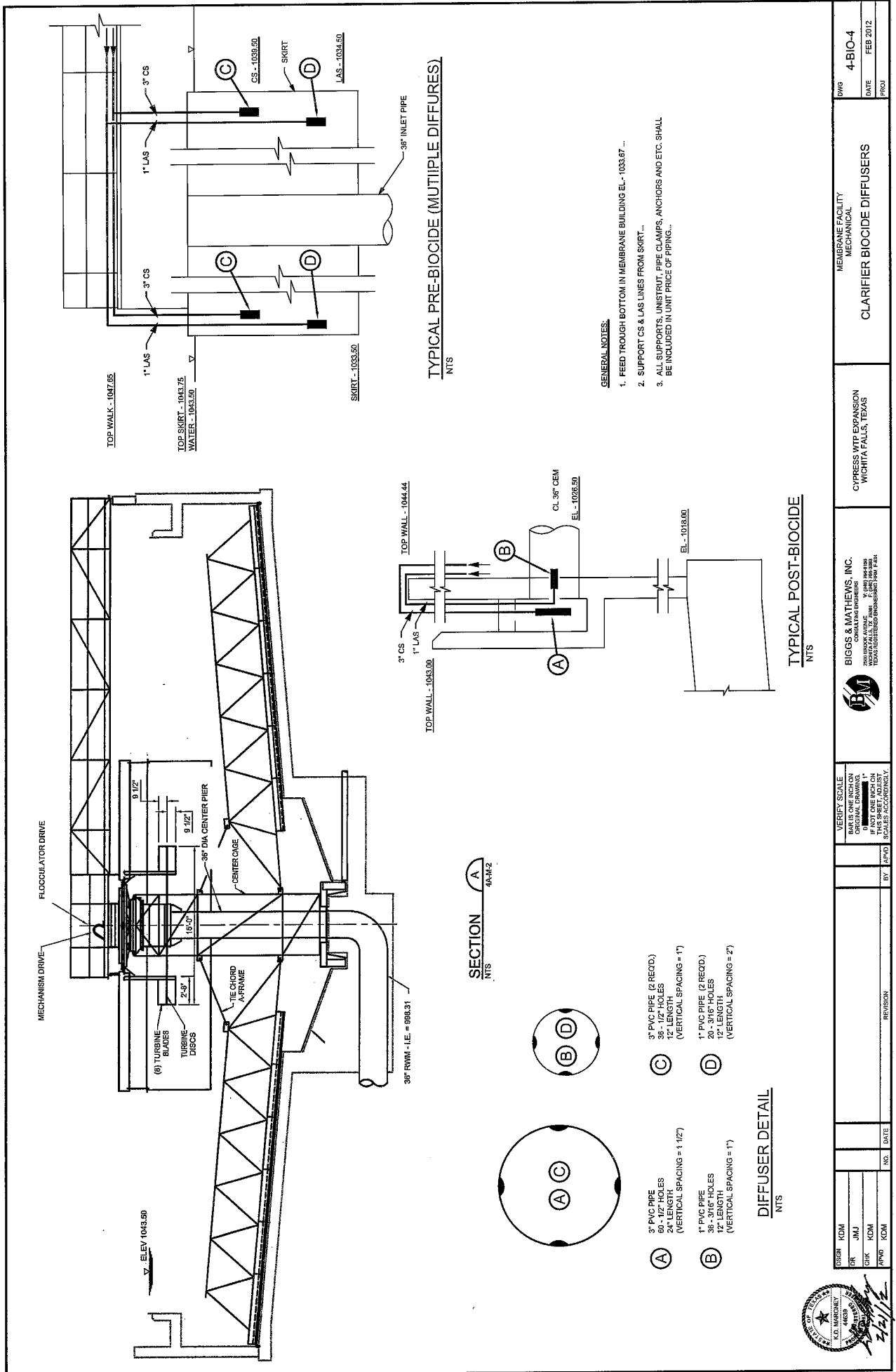
PARTIAL FOUNDATION PLAN 1/8"=1'-0"

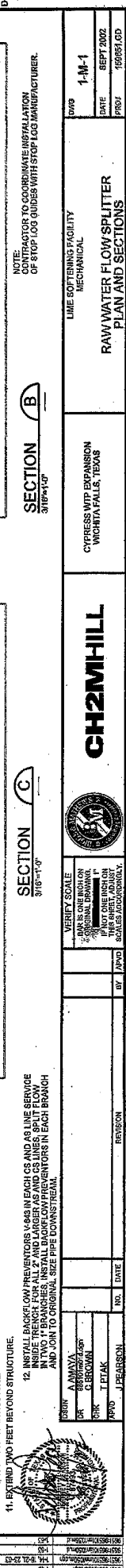


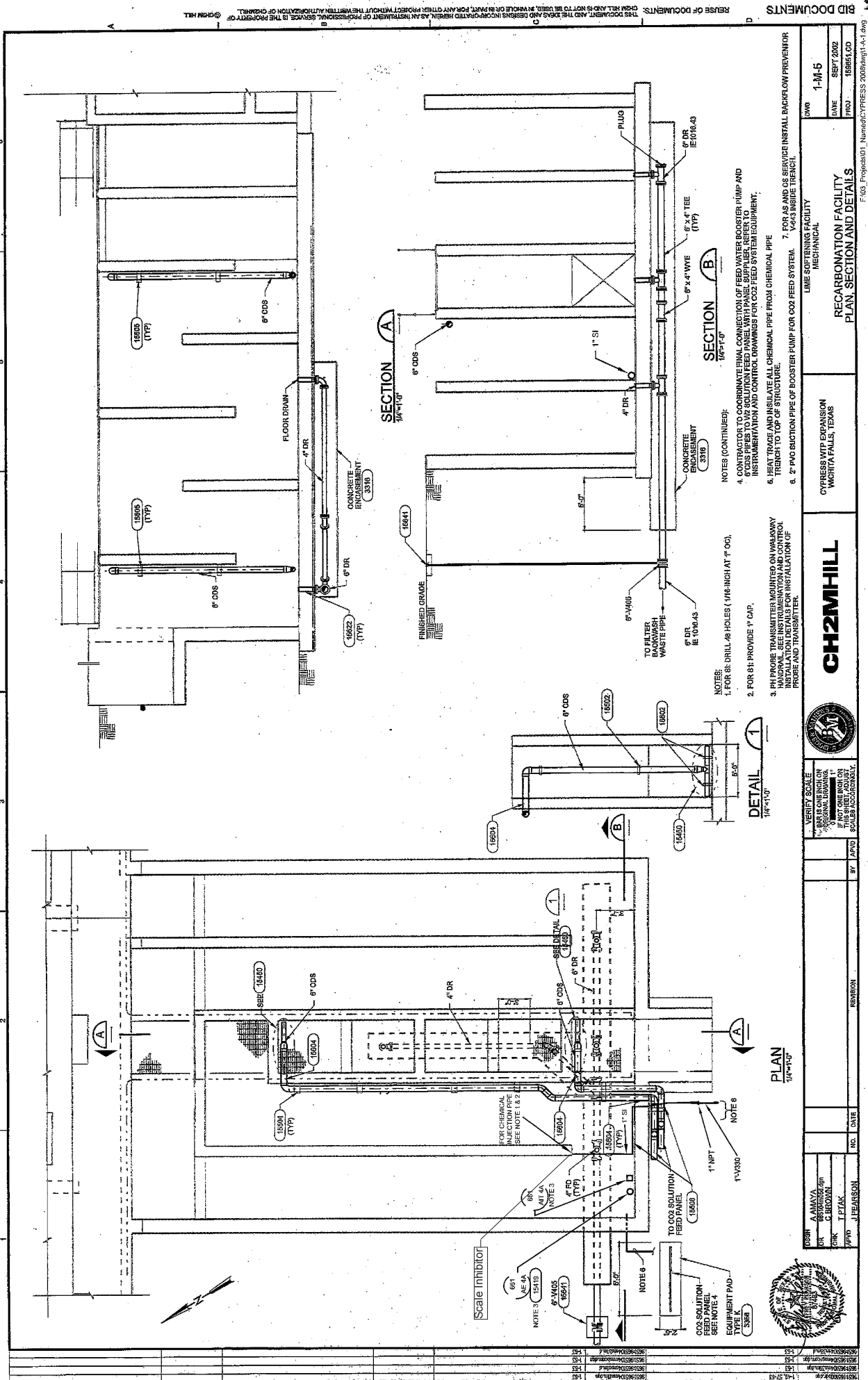


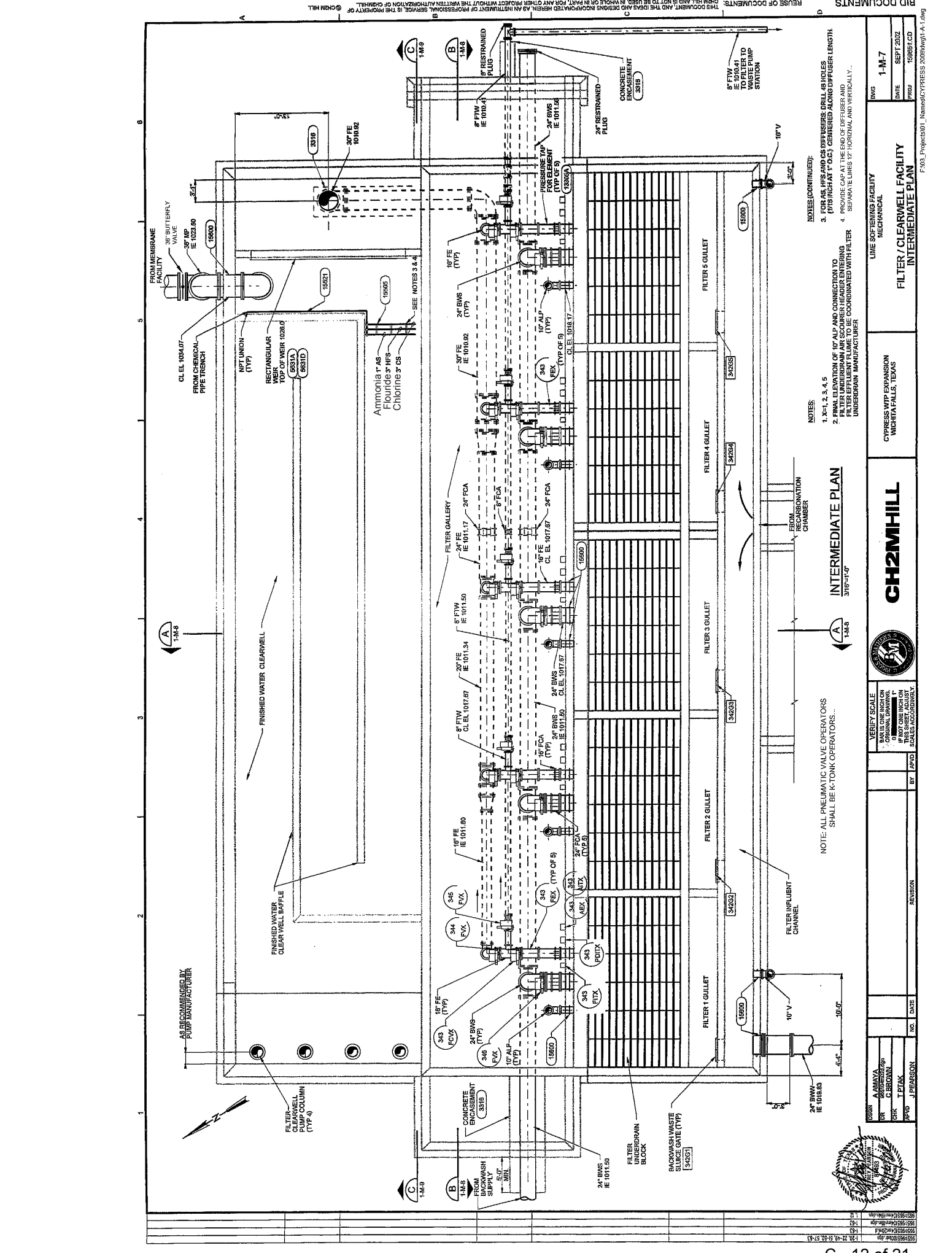
56











NOTES (CONTINUED):
3. FOR AS BUILT AND AS SHOWN, SEE CH2M HILL'S
4. PROVIDE GAS AT THE END OF RECESSED AND
SEPARATE LINES 12" HORIZONTAL AND VERTICALLY.

NOTES:
1. X-1, 2, 3, 4, 5
2. FINAL ELEVATION OF 10" ALP AND CONNECTION TO
3. PROVIDE GAS AT THE END OF RECESSED AND
4. PROVIDE GAS AT THE END OF RECESSED AND
UNDERDRAIN MANUFACTURER

INTERMEDIATE PLAN
316'-71'-0"

NOTE: ALL PNEUMATIC VALVE OPERATORS
SHALL BE K-TONK OPERATORS...

CH2MHILL		CYPRESS WTP EXPANSION WICHITA FALLS, TEXAS		LINE SOUTHERN FACILITY MECHANICAL		FILTER / CLEARWELL FACILITY INTERMEDIATE PLAN		1-M-7	
VERIFIED SCALE ORIGINAL DRAWING THIS SHEET, ADJUST SIZES ACCORDINGLY		REVISION		DATE		DWG		1-M-7	
AMARVA C. BROWN		J. PEARSON		10/10/2022		DWG		10/10/2022	
C. BROWN		J. PEARSON		10/10/2022		DWG		10/10/2022	
C. BROWN		J. PEARSON		10/10/2022		DWG		10/10/2022	
C. BROWN		J. PEARSON		10/10/2022		DWG		10/10/2022	



PUBLIC WORKS DEPARTMENT

In accordance with the TCEQ's request for automatic shutdown alarms, the following were tested.

- Sample Site 1J: Turbidity >24 NTU

Date: 3/18/2014

Alarm Displayed: ☒ Yes ☐ No

Audible Alarm: ☒ Yes ☐ No

Pump Shutdown: ☒ Yes ☐ No

- Sample Site 2J: Total Chlorine Residual <0.5 Mg/l

Date: 1/31/2014

Alarm Displayed: ☒ Yes ☐ No

Audible Alarm: ☒ Yes ☐ No

Pump Shutdown: ☒ Yes ☐ No

I certify that I witnessed all automatic shutdown alarms listed above.

Signature Harold Burris

Print Name Harold Burris

CITY OF WICHITA FALLS

1005 River Road • Wichita Falls, Texas 76305 • t: (940) 766-2841 • f: (940) 723-9542
www.wichitafallstx.gov



PUBLIC WORKS DEPARTMENT

Re: Automatic shutdown alarms for Wichita Falls FSV test

In accordance with the TCEQ's September 5, 2013 letter requiring automatic shutdowns and alarms, Wichita Falls tested the following on January 25, 2014:

- Page 5, b.: A MF membrane unit out of service when its filtrate turbidity level is greater than 0.100 nephelometric turbidity units (NTU) for two consecutive five-minute readings.

Alarm Displayed: ☒ Yes ☐ No Audible Alarm: ☒ Yes ☐ No

- Page 5, c.: Waste Lagoon No. 3's reuse pumps out of service when the partially treated RR WWTP flow rate is greater than the Secondary Reservoir's raw surface water flow rate to the Cypress Splitter Box.

Alarm Displayed: ☒ Yes ☐ No Audible Alarm: ☒ Yes ☐ No

- Page 5, d.: A gravity media filter out of service when the individual filter effluent turbidity level exceeds 0.3 NTU (or 0.15 NTU if additional removal credit is being sought) for two consecutive 15-minute readings.

Alarm Displayed: ☒ Yes ☐ No Audible Alarm: ☒ Yes ☐ No

- Page 6, e.: All the 2010 SWTP clearwell's transfer pumps out of service when the volume of filtered water in the 2010 SWTP clearwell is less than 50.0-percent of the reported full operating capacity.

Alarm Displayed: ☒ Yes ☐ No Audible Alarm: ☒ Yes ☐ No

- Page 6, f.: All the 10.0-MG GST's high service pumps out of service when:*

i. The nitrate level in the 10.0 MG GST's effluent is greater than 10.0 mg/L; or*

ii. The 10.0-MG GST's volume of water is less than 50.0-percent of the reported full operating capacity.*

Alarm Displayed: ☒ Yes ☐ No Audible Alarm: ☒ Yes ☐ No

*The 10.0-MG GST's high service pumps were not in use during the FSV, and the testing of the automatic shutdown for these pumps will be performed prior to Full Scale Operation. The 2010 clearwell pumps were tested for the automatic nitrate shutdown.

I certify that I witnessed all automatic shutdown alarms and audible alarms listed above on January 25, 2014.

Signature Mark Southard

Print Name Mark Southard

CITY OF WICHITA FALLS

4801 Big Ed Neal Dr. • P.O. Box 1431 • Wichita Falls, Texas 76310 • t: (940) 691-1153 • f: (940) 691-4121
www.wichitafallstx.gov

RECLAIMED 210 WATER SUMMARY

River Road WWTP

Effluent didn't exceed limits therefore no corrective actions needed.

Daily Avg.

Date	Turbidity	CBOD	E-Coli	DPR
Monday, January 27, 2014	2.60	4.11	mg/l 4	CFU/100ml 2,760,000
Tuesday, January 28, 2014	2.84	5.43	mg/l 4	CFU/100ml 2,770,000
Wednesday, January 29, 2014	2.71	4.54	mg/l 4	CFU/100ml 2,860,000
Thursday, January 30, 2014	2.62	4.68	mg/l 4	CFU/100ml 2,900,000
Friday, January 31, 2014	3.30	4.06	mg/l 4	CFU/100ml 2,920,000
Saturday, February 01, 2014	3.60	3.56	mg/l	CFU/100ml 2,960,000
Sunday, February 02, 2014	4.09	3.85	mg/l	CFU/100ml 2,940,000
Monday, February 03, 2014	4.58	3.98	mg/l 4	CFU/100ml 2,950,000
Tuesday, February 04, 2014	4.75	4.33	mg/l 4	CFU/100ml 2,730,000
Wednesday, February 05, 2014	4.21	3.75	mg/l 4	CFU/100ml 2,820,000
Thursday, February 06, 2014	4.58	4.24	mg/l 4	CFU/100ml 2,720,000
Friday, February 07, 2014	5.07	4.60	mg/l 4	CFU/100ml 2,720,000
Saturday, February 08, 2014	4.80	3.74	mg/l	CFU/100ml 2,720,000
Sunday, February 09, 2014	5.24	4.69	mg/l	CFU/100ml 2,720,000
Monday, February 10, 2014	5.55	4.31	mg/l 4	CFU/100ml 2,710,000
Tuesday, February 11, 2014	4.29	5.32	mg/l 4	CFU/100ml 2,710,000
Wednesday, February 12, 2014	3.53	4.59	mg/l 4	CFU/100ml 2,700,000
Thursday, February 13, 2014	3.57	4.79	mg/l 4	CFU/100ml 2,710,000
Friday, February 14, 2014	3.60	4.87	mg/l 4	CFU/100ml 2,710,000
Saturday, February 15, 2014	3.41	4.44	mg/l	CFU/100ml 2,710,000
Sunday, February 16, 2014	3.04	4.41	mg/l	CFU/100ml 2,710,000
Monday, February 17, 2014	2.44	4.98	mg/l 4	CFU/100ml 2,710,000
Tuesday, February 18, 2014	2.28	4.99	mg/l 4	CFU/100ml 2,720,000
Wednesday, February 19, 2014	2.69	4.08	mg/l 4	CFU/100ml 2,710,000
Thursday, February 20, 2014	3.64	3.97	mg/l 4	CFU/100ml 2,710,000
Friday, February 21, 2014	3.93	4.69	mg/l 4	CFU/100ml 2,710,000
Saturday, February 22, 2014	3.66	4.89	mg/l	CFU/100ml 2,710,000
Sunday, February 23, 2014	3.90	4.40	mg/l	CFU/100ml 2,690,000
Monday, February 24, 2014	4.67	5.03	mg/l 4	CFU/100ml 2,690,000
Tuesday, February 25, 2014	4.22	5.09	mg/l 4	CFU/100ml 2,700,000
Wednesday, February 26, 2014	5.01	4.84	mg/l 4	CFU/100ml 2,690,000
Thursday, February 27, 2014	4.68	4.76	mg/l 4	CFU/100ml 2,720,000
Friday, February 28, 2014	4.16	4.46	mg/l 8	CFU/100ml 2,710,000
Saturday, March 01, 2014	3.97	4.29	mg/l	CFU/100ml 2,710,000
Sunday, March 02, 2014	4.29	3.93	mg/l	CFU/100ml 2,690,000
Monday, March 03, 2014	4.75	4.15	mg/l 4	CFU/100ml 2,700,000
Tuesday, March 04, 2014	4.31	4.36	mg/l 4	CFU/100ml 2,700,000
Wednesday, March 05, 2014	4.45	4.61	mg/l 4	CFU/100ml 2,710,000
Thursday, March 06, 2014	4.04	4.12	mg/l 4	CFU/100ml 2,700,000
Friday, March 07, 2014	3.78	3.71	mg/l 4	CFU/100ml 2,710,000
Saturday, March 08, 2014	4.04	4.53	mg/l	CFU/100ml 2,700,000
Sunday, March 09, 2014	4.50	5.21	mg/l	CFU/100ml 2,700,000
Monday, March 10, 2014	5.41	4.91	mg/l 4	CFU/100ml 2,710,000
Tuesday, March 11, 2014	4.93	4.42	mg/l 4	CFU/100ml 2,710,000
			mg/l	CFU/100ml
Average	3.99	4.47	4.09	GEOMEAN

Daily average discharge **2,742,273** # of discharge days **44** gallons

	Turbidity	CBOD	E-Coli
Average	3.99	4.47	4.09
MAX	7.25	5.43	8.00

Max Turbidity was March 10, 2014

Max CBOD was January 28, 2014

Max Ecoli was February 28, 2014

List of Shutdown Triggers and Alarms

The following Shutdown Triggers and Alarms are utilized in the Full Scale Verification test of Wichita Falls' Direct Potable Reuse project. Although not an exhaustive list, these are the triggers that the City of Wichita Falls determined were realistic in monitoring and operating the Full Scale Verification test.

RRWWTP

TCEQ Site	Trigger	Alarm Only or Alarm & Auto Shutdown	On-line or Grab	Equipment to be Taken Off-Line Upon Triggering
N/A	Discolored Water @ Headworks	Alarm Only	Grab	Entire DPR
N/A	High DO Demand in Aeration Basins	Alarm Only	Grab	Entire DPR
N/A	Planned Maintenance	Alarm Only	Grab	Only Unit Experiencing Maintenance
N/A	Fish Kill @ Outfall	Alarm Only	Grab	Entire DPR
N/A	Microscopic Examination Indicating Toxicity	Alarm Only	Grab	Entire DPR
1J & 2J	Power Failure	Alarm & Auto Shutdown	N/A	Entire DPR
1J	Petroleum Detected in Final Clarifiers	Alarm Only	Grab	Entire DPR
1J	Solids Washout in Final Clarifier	Alarm Only	Grab	Entire DPR
1J	Surfactant Visible in Final Clarifier	Alarm Only	Grab	Entire DPR
1J	Detection of Giardia > 7,000 cysts/100L	Alarm Only	Grab	Entire DPR
1J	Detection of Cryptosporidium >948 oocysts/100L	Alarm Only	Grab	Entire DPR
1J	Detection of Total Culturable Virus >22.2 MPN/L	Alarm Only	Grab	Entire DPR
1J	Turbidity > 24.0 NTU	Alarm & Auto Shutdown	On-Line	Entire DPR
2J	High Chlorine Demand	Alarm & Auto Shutdown	On-line	Entire DPR
2J	Chlorine Failure	Alarm & Auto Shutdown	On-line	Entire DPR
2J	Permit Failure	Alarm Only	Grab	Entire DPR

2008 MF/RO SWTP

TCEQ Site	Trigger	Alarm Only or Alarm & Auto Shutdown	On-line or Grab	Equipment to be Taken Off-Line Upon Triggering
3J	Any detection of a Leak on Pipeline between RRWWTP and CWTP, or suspicious leaks that would indicate a contaminant may have been introduced to the RRWWTP Effluent.	Alarm Only	N/A	Entire DPR
10J	MF Cell Failing DIT using a TCEQ approved or greater test pressure.	Alarm & Auto Shutdown	On-line	MF Cell (until repaired and passes a TCEQ approved DIT)
10J	MF Cell Effluent >0.100 NTU for 2 consecutive 5 minute readings	Alarm & Auto Shutdown	On-line	MF Cell (until backwashed and passes a TCEQ approved DIT)
10J	MF Cell Effluent >0.100 NTU for two consecutive 5-minute readings twice in a one-hour period	Alarm & Auto Shutdown	On-line	Entire DPR (TCEQ Technical Review & Oversight Team contacted)
16J	Combined MF Turbidity > 0.15 NTU for 2 consecutive 5 minute readings	Alarm & Auto Shutdown	On-line	Everything from MF forward (MF system investigated)
16J	RO Feed Silt Density Index > 3	Alarm Only	Grab	Everything from RO forward (by-pass RO feed to Brine Pump Station)
16J	RO Feed ORP > 500 or detectable Total Chlorine	Alarm Only	On-line	Everything from RO forward (by-pass RO feed to Brine Pump Station)
20J	RO Permeate Nitrate > 9.5 ppm	Alarm & Auto Shutdown	On-line	RO Train
20J	Detection of Giardia in RO Permeate	Alarm Only	Grab	Everything from RO forward
20J	Detection of Cryptosporidium in RO Permeate	Alarm Only	Grab	Everything from RO forward
3J – 22J	Power Failure	Alarm	N/A	Entire DPR

2010 Conventional SWTP

TCEQ Site	Trigger	Alarm Only or Alarm & Auto Shutdown	On-line or Grab	Equipment to be Taken Off-Line Upon Triggering
23J – 40J	Power Failure	Alarm	N/A	Entire DPR
28J	Lagoon Flow exceeds Secondary Reservoir Flow	Alarm	On-line	Lagoon Pumps ramped down or shutdown if ramping does not control the flow.
35J	Individual Filter Effluent Turbidity >0.15 NTU for two consecutive 15-minute readings at the 2010 SWTP Granular Filters	Alarm	On-line	None – Notify Supervisor
35J	Individual Filter Effluent Turbidity >0.3 NTU for two consecutive 15-minute readings at the 2010 SWTP Granular Filters	Alarm & Auto Shutdown	On-line	Granular Filter
40J	2010 SWTP Clearwell Level below 50.0% of total volume.	Alarm	On-Line	2010 Transfer Pumps ramped down or shutdown if ramping does not increase the Clearwell level.
40J	Monochloramine residual in the water entering the Distribution System drops below 3 ppm.	Alarm	Grab	None – Notify Supervisor
40J	Detection of Giardia by a TCEQ acceptable laboratory after filtering a minimum of 15 Liters of water at Point of Entry to Distribution and analyzing it using EPA Method 1623	Alarm Only	Grab	Entire DPR
40J	Detection of Giardia at Point of Entry to Distribution System Using qPCR	Alarm Only	Grab	Entire DPR
40J	Detection of Cryptosporidium by a TCEQ acceptable laboratory after filtering a minimum of 15 Liters of water at Point of Entry to Distribution and analyzing it using EPA Method 1623	Alarm Only	Grab	Entire DPR
40J	Detection of Cryptosporidium at Point of Entry to Distribution System Using qPCR	Alarm Only	Grab	Entire DPR
40J	Detection of any Total Culturable Virus by a TCEQ acceptable laboratory in water at Point of Entry to Distribution	Alarm Only	Grab	Entire DPR
40J	Nitrate at Point of Entry to Distribution > 9.5 ppm	Alarm & Auto Shutdown	On-line	Entire DPR
40 J	Turbidity at Point of Entry to Distribution >0.2 NTU at any hourly monitoring	Alarm Only	Grab	None – Supervisor Notification
40J	Turbidity at Point of Entry to Distribution >0.3 NTU for 2 consecutive 15 minute readings	Alarm & Auto Shutdown	On-Line	Entire DPR

**2010 Conventional SWTP
continued**

40J	CT Failure (would be caused by low/no monochloramine residual in a disinfection zone that prevents the required pathogen inactivation from being achieved)	Alarm Only		Grab	Entire DPR
40J	TTHM/HAA5 at Point of Entry to Distribution that exceeds 40/30 ppb, respectively.	Alarm Only		Grab	None – Operations Notification
40J	Violation of any Primary or Secondary Drinking Water Standard at Point of Entry to Distribution	Alarm Only		Grab	Entire DPR
42J	10 MG GST volume is less than 50.0% of the total volume.	Alarm		On-line	CWTP High Service Pumps ramped down or shutdown if ramping does not increase the GST level.
N/A	Repeat Total Coliform sample within Distribution System	Alarm Only		Grab	Entire DPR
N/A	A Distribution System sample that is positive for E. coli	Alarm Only		Grab	Entire DPR
N/A	A Distribution System sample for TTHM/HAA5 that exceeds 80/60 ppb, respectively.	Alarm Only		Grab	None – Operations Notification
N/A	Systemic problems with Monochloramine residuals in the Distribution System dropping below 1.5 ppm, collected at the Distribution System Bacteriological Sampling Sites.	Alarm Only		Grab	None – Operations Notification
N/A	Any Identified Waterborne Disease Outbreak within the City of Wichita Falls	Alarm Only		N/A	Entire DPR