El Paso County Water Control and Improvement District #4

Brackish Groundwater Treatment Facility

Water Treatment of Raw Water Wells

EL PASO COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT # 4

FABENS, TEXAS

1/28/16

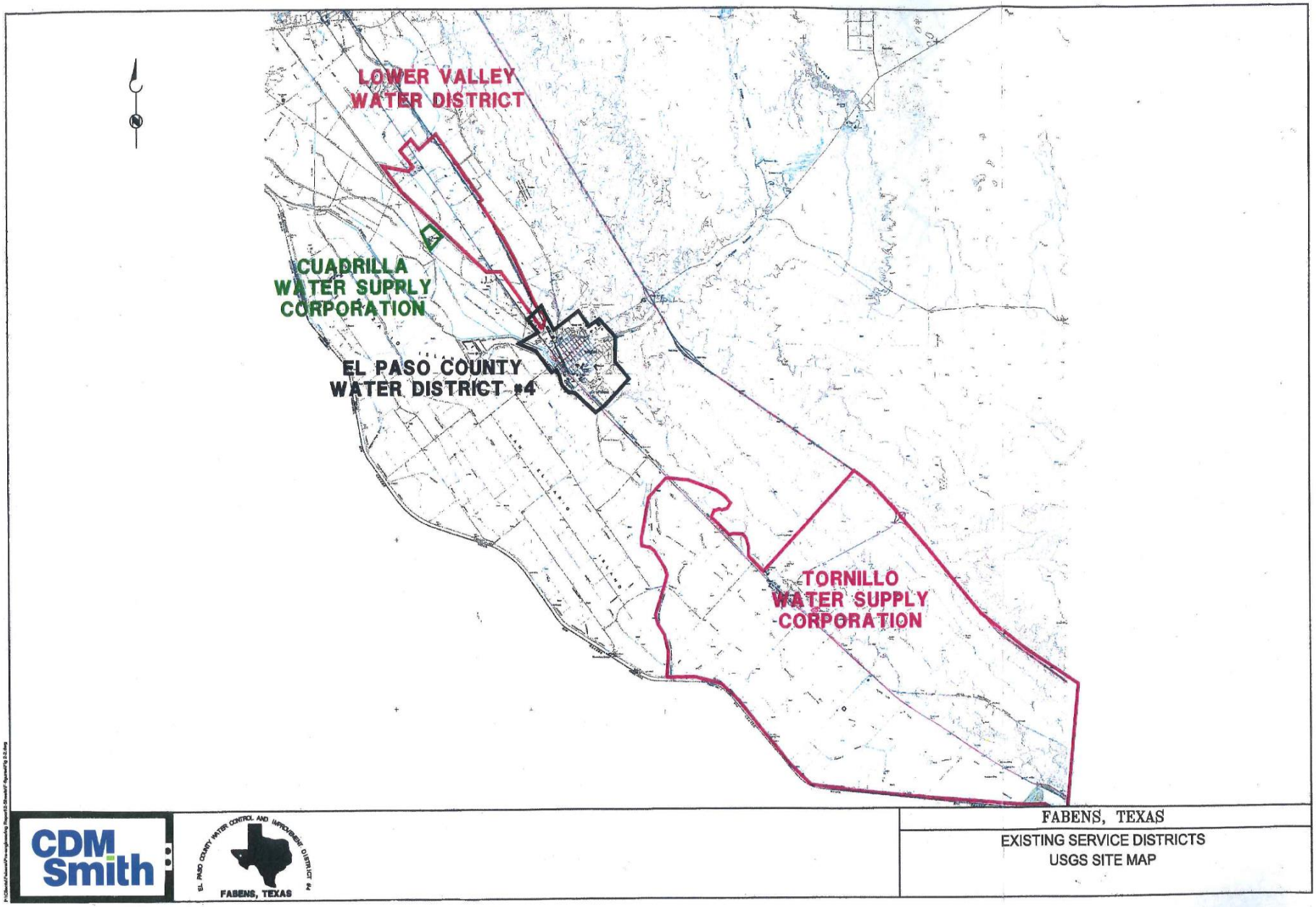
CDM Smith

El Paso County Water Control and Improvement District #4
Brackish Groundwater Treatment Facility

1. The EPCWCID #4 encompasses 886 acres, including the unincorporated Town of Fabens.

2. The population of the area is approximately 8,860 inhabitants.

3. The EPCWCID #4 provides water and wastewater services to approximately 2,200 customers.


LOWER VALLEY
WATER DISTRICT
CUADRILLA
WATER SUPPLY
CORPORATION
EL PASO COUNTY
WATER DISTRICT #4
TORNILLO
WATER SUPPLY
CORPORATION
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EL PASO COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT #4
FABENS, TEXAS
FABENS, TEXAS
EXISTING SERVICE DISTRICTS
USGS SITE MAP
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Existing Raw Water Supply Wells

Well	Location	Drill Date	Depth (ft)	Well Pump	Status
CC Camp Well	120 CC Camp NE	6/22/68	500	40 hp, 700 gpm, Submersible	Out of Service
10th Street Well	991 Walker Street	12/29/77	450	40 hp, 480 gpm, Submersible	In Service
Golf Course Well	601 NE 4th Street	11/23/90	350	40 hp, 550 gpm, Vertical Turbine	In Service
Well #4	1220 Camp NE Street	6/24/94	560	50 hp, 700 gpm, Vertical Turbine	In Service
Well #5 (Cemetery)	1368 Cypress Road	8/12/94	450	40 hp, 550 gpm, Vertical Turbine	In Service

Water Quality Analysis Conducted for Each Well

Constituent	TCEQ Regulatory Limit	Golf Course Well	10th St. Well	Well #4	Well #5
Aluminum, mg/l	0.05-0.2	0.00755	0.00473	<0.05	0.0231
Chloride, mg/l	300.0	181	223	214	296
Platinum-Cobalt color	15.0	n.d.	n.d.	N/A	N/A
Copper, mg/l	1.0	0.00727	0.00182	<0.02	0.0181
Corrosivity, SU	Non-corrosive	N/A	N/A	N.A	N/A
Surfactants, mg/l	0.5	n.d.	n.d.	n.m.	n.d.
Iron, mg/l	0.3	0.50	2.44	0.09	4.02
Manganese, mg/l	0.05	0.182	0.449	0.184	0.397
Odor, dilution	3.0	n.d.	n.d.	N/A	n.d.
pH	≤7	7.90	7.80	7.94	7.40
Silver, mg/l	0.10	<0.01	<0.02	<0.001	<0.02
Sulfate, mg/l	300.0	157	236	N/A	245
Total dissolved solids, mg/l	1000.0	800	1150	688	1080

N/A = not applicable n.m. = not measured n.d. = not detected

Water Quality Analysis Conducted for Each Well, continued:

Constituent	Regulatory Limit	Golf Course Well	10th St. Well	Well #4	Well #5
Zinc, mg/l	5.0	0.00841	<0.0081	0.15	<0.01
Total Sodium, mg/l	N/A	161	193	N/A	241
Fluoride, mg/l	2.0 (secondary) 4.0 (primary)	0.34	0.49	0.695	0.42
Alkalinity, mg/l	N/A	n.m.	n.m.	199-211	177-207
Hardness, mg/	N/A	236	344	N/A	382

The groundwater does not meet the Texas Commission of Environmental Quality Water Quality Standards.

N/A = not applicable n.m. = not measured n.d. = not detected

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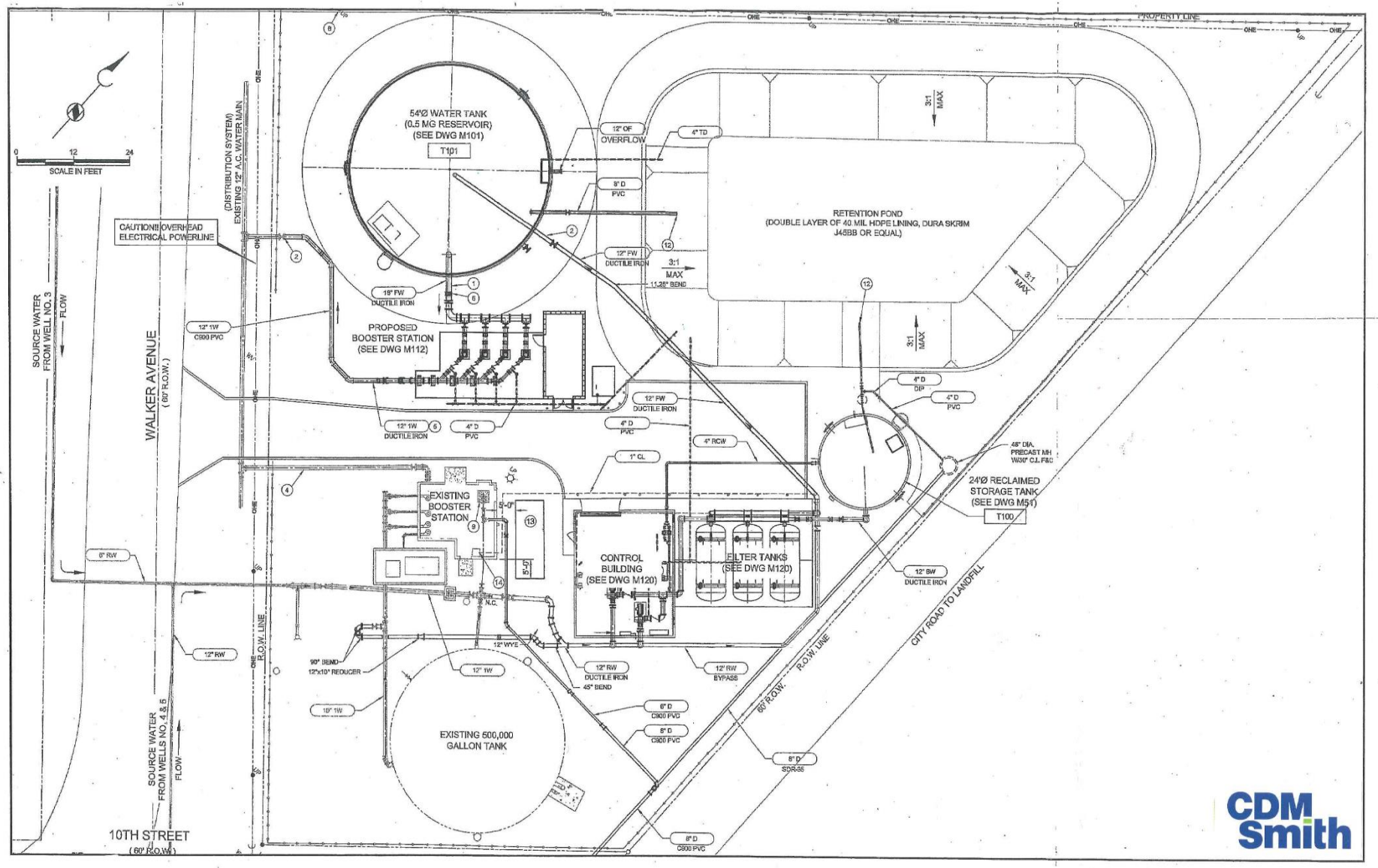
Existing 10th St Booster Station and Pre-Treatment System

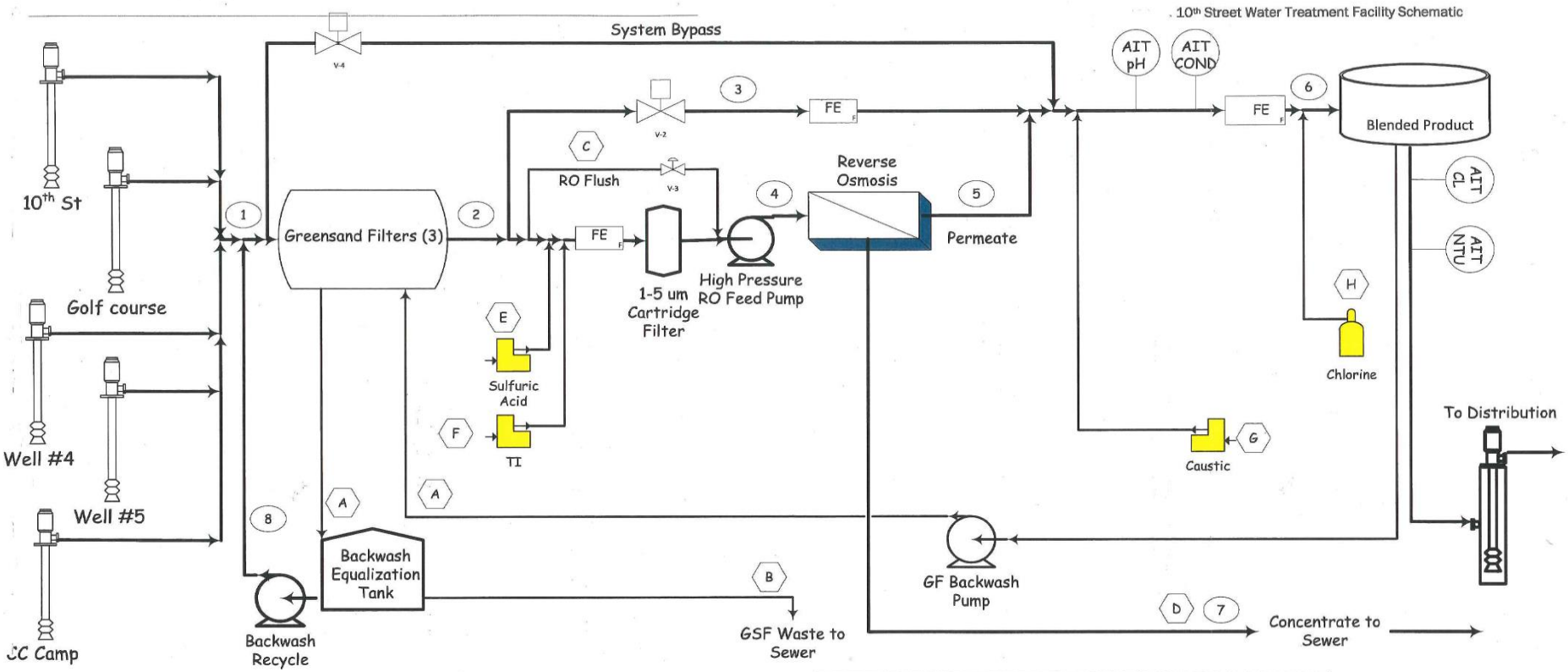


Existing 10th Street Water Treatment Facility Layout

Raw Water Quality vs. Post-Filtration Water Quality

		Iron (mg/l)	Manganese (mg/l)
Regulatory Limit		0.3	0.05
Golf Course Well	Before	0.50	0.182
	After	0.178	0.182
10th St. Well	Before	2.44	0.449
	After	0.108	0.01
Well #4	Before	0.09	0.184
	After	0	0.01
Well #5	Before	4.02	0.397
	After	0.204	0.01

P&ID of Pre-treatment and RO Facility:



Process Flow Stream Summary*					
(#) Stream ID	Description	Pressure (PSI)	Avg Flow (mgd)	Instantaneous Flow (gpm)	Estimated TDS (mg/l)
1	Greensand Filter Feed	70	1.18	823	1710
2	Filtered Water	50	1.18	823	1710
3	Blending Stream	20	0.36	250	1710
4	RO Feed	200	0.82	577	1728
5	RO Permeate	20	0.64	450	29
6	Blended Product	20	1.00	700	686
7	RO Concentrate	30	0.17	117	7752
8	Backwash Recycle	50	TBD	TBD	686
9	System Bypass	20	0	0	1710

*Based on a feed stream consisting of Well #5 and 10th Street sources

Summary of Chemical Application and Periodic Discharges			
(@) Stream ID	Description	Frequency	Quantity
A	Greensand Filter Backwash	3 x /week	TBD
B	Greensand Filter Waste	3 x /week	TBD
C	RO Flush	Daily	1260 gallons
D	CIP Waste (Neutralized)	1 x/ 4-6 months	1900 gallons
E	Sulfuric Acid (93.2%)	Continuous	483 lbs/day
F	Threshold Inhibitor	Continuous	33 lbs/day
G	Sodium Hydroxide (50%)	Continuous	748 lb/day
H	Chlorine Gas Solution	Continuous	<20lb/day

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FABENS BRACKISH WATER DESALTER
PROCESS FLOW DIAGRAM

TCEQ Permitting for Concentrate Disposal Process

WWTP TPDES Discharge Permit was amended for approval to discharge RO concentrate into wastewater collection system

1. TCEQ Wastewater Permit Section - Water Quality Division
2. TCEQ Stormwater and Pre-Treatment Team - Water Quality Division

TCEQ TPDES Effluent Limitation and Monitoring Requirements

El Paso County Water Control and Improvement District No. 4 — TPDES Permit No. WQ0010166001

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS — Outfall Number 001

1. During the period beginning upon the date of issuance and lasting through the date of expiration, the permittee is authorized to discharge subject to the following effluent limitations:

   The annual average flow of effluent shall not exceed 1.2 million gallons per day (MGD); nor shall the average discharge during any two-hour period (2-hour peak) exceed 2,500 gallons per minute (gpm).

Effluent Characteristic	Discharge Limitations				Min. Self-Monitoring Requirements	
	Daily Avg mg/l (lbs/day)	7-day Avg mg/l	Daily Max mg/l	Single Grab mg/l	Report Daily Avg. & Daily Max. Measurement Frequency	Sample Type
Flow, MGD	Report	N/A	Report	N/A	Continuous	Totalizing Meter
Carbonaceous Biochemical Oxygen Demand (5-day)	20 (200)	30	45	65	Two/week	Composite
Total Suspended Solids	20 (200)	30	45	65	Two/week	Composite
Ammonia Nitrogen	4 (40)	7	10	15	Two/week	Composite
Total Dissolved Solids	Report (Report)	N/A	Report	N/A	Two/week	Composite
Total Chlorides	Report (Report)	N/A	Report	N/A	Two/week	Composite
E. coli, CFU or MPN/100 ml	126	N/A	399	N/A	Daily	Grab

2. The permittee shall utilize an Ultraviolet Light (UV) system for disinfection purposes. An equivalent method of disinfection may be substituted only with prior approval of the Executive Director.
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per week by grab sample.
4. There shall be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
5. Effluent monitoring samples shall be taken at the following location(s): Following the final treatment unit.
6. The effluent shall contain a minimum dissolved oxygen of 2.0 mg/l and shall be monitored twice per week by grab sample.
7. The annual average flow and maximum 2-hour peak flow shall be reported monthly.

TCEQ Pre-Treatment Process Sewage Disposal

4. TREATMENT PROCESS DESCRIPTION AND SEWAGE SLUDGE DISPOSAL

The Fabens Wastewater Treatment Plant Wastewater Treatment Facility is an activated sludge process plant operated in the extended aeration mode. Treatment units include bar screen (2 per unit), grit removal chamber (3 per unit), selector tank, four aeration tanks (2 per unit), secondary clarifier, aerobic sludge digesters (2 units) and ultraviolet light (UV) disinfection. The facility is operating in the final phase.

The permittee proposes to include a reverse osmosis facility for potable water to remove total dissolved solids. Concentrate waste discharge from the reverse osmosis facility will be in the range between 193 gpm @ 560 mg/L and 93 gpm @1260 mg/L of total dissolved solids in addition to the existing flows from the wastewater treatment facility. The Reverse Osmosis (RO) facility has not been constructed. Pretreatment evaluation of the information provided concludes that the El Paso County Water Improvement District No. 4 - Fabens wastewater treatment plant does not appear to receive significant industrial wastewater contributions.

Sludge generated from the treatment facility is hauled by a registered transporter and disposed of at a TCEQ permitted landfill, Camino Real Landfill, Permit No. SWM 072205, in Dona Ana County. The draft permit authorizes the disposal of sludge at a TCEQ authorized land application site or co-disposal landfill.

5. INDUSTRIAL WASTE CONTRIBUTION

The draft permit includes pretreatment requirements that are appropriate for a facility of this size and complexity. The facility does not appear to receive significant industrial wastewater contributions.

6. SUMMARY OF SELF-REPORTED EFFLUENT ANALYSES

The following is a summary of the applicant's Monthly Effluent Report data for the period from January 2008 through May 2014. The average of Daily Avg value is computed by the averaging of all 30-day average values for the reporting period for each parameter.

Parameter	Average of Daily Avg
Flow, MGD	0.50
$CBOD_5$, mg/l	6.0
TSS, mg/l	6.4
NH_3-N, mg/l	2.3
E. coli, CFU or MPN/100 ml	13

7. DRAFT PERMIT CONDITIONS AND MONITORING REQUIREMENTS

The effluent limitations and monitoring requirements for those parameters that are limited in the draft permit are as follows:

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

10th St Pre-Treatment and RO Facility System

1. Five Groundwater wells

2. Three green sand filtration system pressure tanks each rated at 600 gpm

3. Two RO skid mounted units each unit rated at 700 gpm with a future unit

4. 500K Water Storage Reservoir

5. 1MGD Booster Station/SCADA

Proposed 10th St Pre-Treatment and RO Facility System