

217 Design Criteria Stakeholder Meeting – Dallas, Texas

The 317 Design Criteria rule will be changing to 217. All water rules will be going to the 200 series. The old rule has been in place since 1951. TCEQ will be taking comments until March 1, 2007.

The new Design Criteria Rule Overview– Louis Herrin

- Gives engineer and owner of the plant direction on what parts have to meet latest design criteria during upgrades and modifications.
- Allows design engineer to design plant based on annual average flow instead of maximum monthly flow
- Requires electric panels be wired for generator – phased in state-wide for new and existing facilities
- Draft criteria will allow city to rerate their plant based on lower organic loading
- Criteria provides options for rerating plants based on influent organic and flow data
- Provides clearer description of the requirement for backup power
- Has section on reuse of effluent within the treatment process whenever possible

Subchapter C: Conventional Collection Systems

- Manholes will go to 30 inches
- National mandrel test
- All lift stations wired for generators

Subchapter D: Alternative Wastewater Collection Systems:

- Vacuum sewer systems – 5 large systems along the Texas coast
- Pressure sewers – spell out management side
- Small diameter variable grade sewers – explains how to take care of that situation

Comment: When system has an emergency, can it require the public to cut down on usage - similar to Drought Contingency plan?

Subchapter E: Preliminary Treatment Units

- Requires metering at front and back end of plant – flow measurement

Subchapter F: Activated Sludge Systems

- Provides design criteria for Sequencing Batch Reactors (SBRs)
- Provides table to determine net solids production
- Changes hopper bottom clarifiers from 25,000 to 10,000
- Requires multiple basin and clarifiers for flows greater than 400,000 gallons

Subchapter G: Fixed Film and Filtration

- Gives credit to trickling filters for nitrification
- Provides design engineer better guidelines for design of filters and fixed film reactors

Subchapter H: Natural Treatment Systems

- Adds more flexibility to design for natural system – raise and lower water level as in wetlands
- Greater flexibility for liner installations
- Criteria for evaporative pond systems
- Criteria for integrated facultative lagoons – can remove 80% BOD
- Reinstates design criteria for Imhoff tanks

Subchapter J: Sludge

- Criteria for chemical pretreatment of sludge
- Provides criteria for sulphur dioxide
- Update design criteria for ultraviolet light disinfection – will have fecal limit in order to get dissolved solids down

Subchapter L: Safety

- Requires safety audit – Emergency plans – Homeland Security
- Job Hazard Analysis and Protective Equipment Lists

Membrane Bioreactors Treatment Systems

- Ultrafiltration Membranes
- Hollow Fiber Membranes
- Flat Plate Membranes

Membrane Bioreactors (MBR)

- Advantages
 - Smaller footprint
 - High quality effluent
 - Automatic control
 - Less sludge
- Disadvantages
 - Capital costs
 - Energy costs for aeration and scouring
 - Highly variable flow require equalization

Membrane Bioreactors – Expected Performance

- CBOD5 <5 mg/l
- TSS <1mg/l
- Ammonia <1 mg/l
- Total Nitrogen (w/pre-anoxic zone) <10 mg/l
- Total Nitrogen (w/pre-anoxic and post-anoxic zone) <3 mg/l
- Total Phosphorus (with chemical addition)
- Total Phosphorus (with Bio-P removal)
- Turbidity <0.2 NTU
- Bacteria up to 6 log removal (99.9999%)

Currently compiling surveys from vendors of membranes to develop design criteria concerns

- Prevention of fouling
- Adequate aeration of high MLSS concentrations
- Achievable rate of flow through membranes
- Adequate pretreatment i.e. fine screening
- Hydraulics
- Ensure integrity
- Foam control
- Warranty
- Nutrient removal

Results of Survey, Literature and other state Regulations

- Membranes
 - Nominal pore size
 - Absolute pore size
- Pretreatment
 - Fine screen (Type, size)
 - Primary clarifier, grit removal, oil and grease removal (when required)
- Operation
 - Gross flux rate @20C
 - Net flux rate @ 20C
 - Operational range for TMP
 - Maximum Operational TMP
 - Operational range of MLSS concentration in Bio Reactor
 - Operational range of MLSS concentration in membrane tank
 - Operational control parameters used and range of values (turbidity, SRT, DO, TMP, ORP)
 - Amount of air used per square foot of membrane
 - Method of integrity testing (i.e. Turbidity)
 - Method of foam control
- Maintenance clean
 - Method
 - Frequency
- Chemical clean
 - Frequency
 - Chemicals used
 - Concentrations
- Redundancy
 - N+1 or other method
- Peak Flow
 - Peak ratio which requires Equalization
- RAS rate (#Q)
- Hydraulics
 - Head required for gravity
- Controls
 - Method of backup for controls

- Warranty
 - Membranes, other equipment and process

217.158 Membrane Bioreactors Treatment Systems (MBR)

- Engineering report required
- Common range of values
- Justification for using parameters outside the common range
- 2 year performance bond

Input from Stakeholders:

Subchapter A: 217.14 Inspections

This will not be an engineering document, but will be guidance manual for the operation. It does not need an engineer's seal and should be a living document.

How does it fit with the final design report?

217.16 Operational Considerations

This will put responsibility on owner of facility, not the engineer. Take (d) out of certified statement. Possibly relocate items in 217.14 into 217.17 – Final Engineering Design Report

Subchapter B: 217.32 (a)(3) Table B.1 Design Organic Loadings

Is chart still relevant to what we do today? Should it be modified? How many are at the 300-500 BOD? Most new systems are designed for up to 350.

Should these numbers be changed due to low water use fixtures? There could be a range put in. Change BOD to CBOD or add a new column for CBOD.

217.35 Backup Power Requirements

Part of these requirements will be in Federal Law – Emergency Management Plan – New Lift stations should be wired to receive a generator.

We learned from Hurricane Rita that dual feed is not good enough. We will also need latitude and longitude on file for lift stations.

217.37 Effluent Reuse

All facilities should use reclaimed water for maintenance routines. May change to potable water for chemical mixing.

Small systems have as high as 1/3 potable water going out for maintenance

Subchapter C: Conventional Collection Systems:

217.53(l) Minimum/Maximum Slopes

Power washing kills lifetime of pipe. More people jetting systems with higher frequency. May make change due to graywater rules. Developers putting in graywater systems to make it “green” housing. If there are graywater systems, velocity would have to be a minimum of 3 feet per second.

217.55 Manholes and Related Structures

Should the existing standard remain or increase in feet? Inspection equipment may not be able to inspect more feet. Might include a range in the chart.

Manholes are sometimes called Personal Entry Ports at some companies. It is cheaper to put manholes in at the beginning instead of retrofitting.

If spacing is increased, smaller systems may not be able to clean it. Could increase spacing of smaller pipes, not larger. Systems can't videocamera 54" lines

217.71 Reclaimed Water and Irrigation Facilities

There are new Type I pipes.

Should lines be closer for reclaimed and raw water lines?

210 Requirements – Separation distance needs to be worked out with drinking water staff. Need justification for having it closer to drinking water lines.

**Chapter 217 Design Criteria for Sewerage Systems
Stakeholder Group
Dallas, Texas
January 11, 2007
Attendee List**

Ken Wesson	NTMWD
David Harris	City of Brownwood
Dean Crenshaw	TWDB
Mark Hill	Carter and Burgess
David Jones	Brazos River Authority
John Durbin	City of Arlington
John Squires	TX WDB
Bill Hallcroft	Water and Waste Management Association
Troy Hotchkiss	KBR
Fariborz Fakheri	DWU
Betty Jordan	Alan Plummer Associates
Sebastian "Buster" Fichera	City of Fort Worth
David Townsend	City of Fort Worth
Gary Strong	Dallas CWWTP
Mark Fleet	Dallas CWWTP
Regina Stencil	DWU – CWWTP
R.A. Castro	TWDB/MESA
Jay Bragg	Brazos River Authority
Bobby Scalf	North Texas MWD
Gary Burton	City of Fort Worth
Chris Kaakaty	City of Dallas
Gary F. Rockers	City of Fort Worth