

217 Design Criteria Stakeholder Meeting – Houston, Texas

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

The new Design Criteria rule – 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: 217.15(a) The facility owner is responsible for having an operations and maintenance manual developed under the direction of the engineer.

Comments: Is it enforceable? It will probably be on the inspector's list. Does it belong in a design criteria document?

Maybe it could be separated into 2 manuals – even put on CD or hard drive

Maybe just update operations manual in the future

The intent is to have documentation for operators in case of emergency – more for medium size systems – 1-5 MGD

Subchapter A: 217.16 Operational Considerations

Compromise language – engineer will talk with operations staff

Increasing review time from 10-30 days

Comments: Why does engineer have to submit a statement? Have owner insure that operations and engineering staff meet and discuss project when applicable.

Subchapter B: 217.35 Backup Power Requirements

Dual speed not considered reliable power

Will probably have to rewrite power requirement depending on federal requirements

All offsite lift stations will have to be wired to accept generators

217.37 Effluent Reuse

Should it be for larger plants and exempt small package plants?

Comments: Make suggestions on range. Should a water audit be included that owner is responsible for? Purpose of rule language is to support water conservation. TCEQ should consider a limited size of plants and implement this for larger plants, not smaller. Require a water audit that will determine if you will be required to do reuse.

Subchapter C: Conventional Collection Systems:

217.53(l) Minimum/Maximum Slope Requirements

Has a suggestion from a city to amend slope requirements – looking for stakeholder input. Some developers are looking into putting in graywater systems in homes. Should minimum slope have to be 3' if putting in graywater system?

Request is from Hill country and may not apply to Houston

217.55 Manholes and Related Structures

Buffer zones around lift stations are not covered in the rule. Onsite are covered by standard buffer zone.

Maximum spacing for manholes is what cleaning equipment used to be. Should we change manhole spacing to what technology is now?

Comment: Should be based on density of users.

Subchapter E: Preliminary Treatment Units:

217.137 Flow Equalization Basins: Should we require aeration or not? How long do you plan on having the water?

Comment: Do you need a buffer zone?

Subchapter F: Activated Sludge Systems:

Minimum of 2.0mg/L DO in aeration chamber. Aeration chamber is design issue, not operation issue.

217.156(b)(2)(D) Diffuser Submergence Correction Factors

Comments: Large difference between 10' and 12'. Should be some type of statement saying that table does not have to be used.

217.157 Sequencing Batch Reactors: There are around 30 in state most around DFW area.

Subchapter J: Sludge - Add anaerobic digestion time period for holding.

Subchapter K: 217.271 Chlorine and Sulfur Dioxide Disinfection and Dechlorination Systems:

Prohibition on heating blankets. Need comments on prohibiting them or add them back into the rule. Use blankets for sulphur dioxide but not chlorine. Do not store chlorine and sulphur dioxide in same room.

Subchapter L: Safety

Does this need to be included in TCEQ rule or be content with it in OSHA rule?
Should there be minimum safety requirement in the Design Criteria rule?

Comments: Would all plants have to have stairways? Could we have height requirements or a minimum degree angle? OSHA addresses height.

**Chapter 217 Design Criteria for Sewerage Systems
Stakeholder Group
Houston, Texas
January 9, 2007
Attendee List**

Jim Wolfe	Severn Trent Services
Trent Martin	Harris County
John Emerson	Harris County
Jennifer Elms	Edminster, Hinshaw, Russ & Associates
Dennis Keyes	City of Houston
Roger Brown	Binkley Barfield
Richard Steadman	Harris County FWSD #47
Barbara Sullivan	TCEQ Region 12 – Houston
Mark Lowry	TCB/AECOM
Susan Karlins	City of Houston
Melinda Sierra	LJA Engineering and Surveying, Inc.
Anura Aturaliye	Weston Solutions
Stan Williams	TCB
Kim Laird	TCEQ
Robert McCarty	PBSJ
Tim Duffy	HCPHES
Susan Young	SWWCSGA
D. Ray Young	Water Engineers
D.R. Dayananda	City of Pasadena
Tina Van Wie	Binkley & Barfield
Ba Dieu	City of Houston
Tobin Synatschk	Jones & Carter, Inc.
Patrick Donart	City of Beaumont
Ramesh Kalluri	Kalluri Group, Inc.
Hal Walker	AIJ Engineering
Mark Urback	Edminster, Hinshaw, Russ & Associates
Jeff Goebel	South Central Water Co.
Brent W. Nicholas	CDM, Inc.
Robert Bulian	Bulian Engr.
Marilyn Christian	Harris County Health & Environmental Services