



WATER ENVIRONMENT ASSOCIATION OF TEXAS

Preserving & Enhancing the Water Environment of Texas

WEAT ▪ 1825 Fortview Road Suite 102 ▪ Austin, Texas 78704 ▪ www.weat.org

January 2, 2012

Mr. Louis C. Herrin III, P.E.
TCEQ MC-148
P. O. Box 13087
Austin, TX 78711-3087

Dear Mr. Herrin:

The Water Environment Association of Texas (WEAT) appreciates the opportunity to comment on TCEQ's proposed revisions to Chapter 217: Design Criteria for Wastewater Systems. WEAT is a non-profit technical and educational organization whose members include scientists, engineers, utility managers, operators, and regulators. Our members are responsible for the design, operation and maintenance of wastewater collection and treatment systems all across Texas.

At the stakeholder meeting on November 1, 2011, agency staff asked for input on TCEQ's proposed revisions to the Design Criteria rule. We have attached comments on two general areas of the Design Criteria rules submitted by the identified WEAT members:

1. Subchapter C: Conventional Collection Systems, and
2. Subchapter M: Safety

Thank you again for the opportunity to comment. If you have any questions or need additional information, please feel free to contact the persons noted on the enclosures or me at 512.924.2102.

Sincerely,

Carol Batterton
Executive Director

Enclosures

cc: Leigh Cerda, P.E., Burgess and Niple, Inc.
Don Vandertulip, P.E., CDM
Meg Conner, SAWS

COMMENTS SUBMITTED BY THE WEAT COLLECTIONS SYSTEMS COMMITTEE

Leigh Cerda, Chair

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1. Recommend adding a section on Trenchless Manhole Product Installation, consistent with 217.56 Trenchless Pipe Installation
 - a. Alternative section title could be “Manhole Coatings and Liners”
 - i. Justification: Precedent has been set with the 217.56 Trenchless Pipe Installation section. Guidance is needed in the industry with regard to Trenchless Manhole Product Installation. In many instances, Trenchless Manhole Products are installed as an option to manhole replacement, restoring structural properties and extending the life of the structure.
2. Recommend adding a section on Trenchless Lift Station Wet-Well Product Installation, consistent with 217.56 Trenchless Pipe Installation
 - a. Alternative section title could be “Lift Station Coatings”
 - i. Justification: Precedent has been set with the 217.56 Trenchless Pipe Installation section. Guidance is needed in the industry with regard to Trenchless Lift Station Wet-Well Product Installation. In many instances, Trenchless Lift Station Wet-Well Products are installed as an option to wet-well replacement, restoring structural properties and extending the life of the structure.
3. Recommend revising Section 217.59 Lift Station sub section D Odor Control.
 - a. Clarification of the terminology “The design of a lift station must minimize potential odor. An owner shall include any design for odor control in the report.” is needed to provide a specific measurable/enforceable guideline. Recommend changing the word “any” to “appropriate” or “approved” at a minimum.
 - i. Justification: With numerous odor control methods/products available, owners need guidance in the goal to be achieved in odor control.
4. Recommend revising Section 217.57 Testing Requirements for Installation of Gravity Collection System Pipes. Section 2 Infiltration/Exfiltration Test.
 - a. The requirement for 50 gallons per inch of diameter per mile of pipe per 24 hours should be evaluated and updated/reduced to reflect the improvements that have been made in pipe materials and installation methods.
 - i. Justification: With improved pipe materials (pipe joint transitions, fused joints) and construction methods, the 50 gallon requirement should be reduced for new construction to demonstrate the industry’s commitment to the reduction in infiltration/exfiltration in our wastewater collection systems.

**COMMENTS SUBMITTED BY SAWS ON
CHAPTER 217 – DESIGN CRITERIA FOR SEWAGE SYSTEMS (LIFT STATIONS)
OPERATIONS AND MAINTENANCE ENGINEERING**

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1. 217.60.(b).(3). Suggest addition of 8-foot high fence with one strand of barbed wire on top, as allowed on the water side, to the intruder resistant fence criteria. There are instances where a 6-foot fence with the three strands of barbed wire may not be appropriate.
2. 217.61.(a). Suggest adding a requirement for a backup high level float on pressure or ultrasonic wet well level systems.
3. 217.61.(b). Specify that 4-inch tall housekeeping pad must be large enough for maintenance personnel to stand on while performing electrical maintenance/troubleshooting. Suggest the housekeeping pad be 4-inch above lift station finish grade.
4. 217.61.(c).(5). Valves can be located in a valve vault or on a concrete pad adjacent to the wet well.
5. 217.61.(d). Ladders “and access hatches” must conform to OSHA requirements.
6. 217.61.(e).(1).(A). Screening on passive ventilation must be of Class 300 Stainless Steel, or other corrosion resistance material.
7. 217.61.(e).(1).(B). Why require explosion proof equipment only if “passive ventilation” is used? The Hazard environment is the same regardless of the type of ventilation used; suggest any equipment within the wet well be required to be explosion-proof, regardless of type of ventilation.
8. 217.61.(e).(2).(B). Again, suggest any equipment in the wet well be required to be explosion-proof, regardless of type of ventilation. Can’t rely on mechanical ventilation systems.
9. 217.61.(f). The need of an anti vortex baffle should be determined by the Peak Wet Weather Flow. Suggest the need of anti vortex baffle for lift stations with Peak Wet Weather Flows greater than 3 MGD.
10. 217.61.(g). Consider rewrite; “Lift stations must either have built-in provisions for use of hoisting equipment, or provide adequate access around the wet well and elsewhere, for unimpeded removal of pumps, motors, valves, pipes, or any other equipment such as standby generators.”
11. 217.61.(i).(1). Indicate that dry well sump pumps must discharge to the wet well. Suggest the pumping capacity of the sump pumps be based on Peak Wet Weather Flows, for instance, discharge 3% of Peak Wet Weather Flow minimum.
12. 217.61.(i).(2). Found this sentence unclear: “A sump pump must use separate pipes capable of discharging more than the maximum liquid level of the wet well.”

13. 217.62.(a).(2). Add “unless pump design is of the semi chopper type designed for self cleaning”.
14. 217.62.(a).(3). Paragraph should read “use 3-inch diameter or greater suction and discharge openings”.
15. 217.62.(b).(1). Delete “...are required...” on the second line.
16. 217.62.(b).(5). Consider rewrite; “Pumps for lift stations with peak flows of less than 120 gallons per minute must be of the submersible, grinder type.”
17. 217.62.(c). Suggest replacing “...handle the expected peak flow” to “...handle the design peak flow.” “Expected” may be open to interpretation, “design” is not.
18. 217.62.(d).(1). Consider; “...curves which determine the pumping capacities alone, and in parallel or series with other pumps according to the design/operational configuration of the station.”
19. 217.62.(d).(4). This paragraph makes sense for lift stations with three or more pumps; for instance, where one pump would be operating under normal conditions, but two or more pumps would operate at peak conditions. Suggest revising this paragraph. This requirement will be impossible to meet for duplex systems because one pump will be operating regardless of normal flows or peak flows.
20. 217.62. Add requirement for calculation of total suction lift for self priming pumps and NPSH for both self priming and submersible pumps.
21. 217.63.(b). First sentence; consider: “The discharge side of each pump must have a check valve, followed by a full-closing isolation valve.”
22. 217.64. Before-last sentence; consider: “All collection system lift stations, not equipped with an on-site standby generator, must be equipped with commercially designed and tested quick-connection facilities for portable generators.”
23. 217.64.(3). Suggest the standby emergency generators be sized to handle all lift station electric load.
24. 217.69.(g). Last sentence; consider: “The air valves must be designed for waste water service, and must be inside of a vault at least 48 inches in diameter, with a vented access opening at least 30 inches in diameter.”

COMMENTS PREPARED BY Don Vandertulip, PE, BCEE
COLOR CODE CONFLICTS
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Code Conflict

Conflicts exist in pipe color designations that can lead to cross connection of two different quality waters. These conflicts include differences in TCEQ Chapter 217 requirements with Chapter 285 and Chapter 210. Chapter 217.321(a) Safety Design-requires compliance with WEF MOP No. 8. There are several conflicts with the most current (2009) WEF MOP No. 8 and the National Plumbing Code. Independently, Chapter 217 is in conflict with both the Uniform Plumbing Code (UPC) developed by the International Association of Plumbing and Mechanical Officials (IAPMO) and the International Plumbing Code (IPC) developed by the International Code Council (ICC).

A portion of Chapter 217 is included below. Conflicts with WEF MOP No. 8 and national plumbing codes are highlighted in yellow.

§217.329. Color Coding of Pipes.

- (a) A new facility must have color-coded pipes.
- (b) A new facility must have tracer tape for each non-metallic underground pipe.
- (c) An existing facility must color-code and install tracer tape for each pipe associated with a material alteration or expansion .
- (d) A non-potable water pipe must be painted purple and be stenciled "**NON-POTABLE WATER**" or "**UNSAFE WATER.**"
- (e) A facility design must use the following color-coding for pipes:
 - (1) Sludge - brown;
 - (2) Natural gas - red;
 - (3) Potable water - light blue;
 - (4) Chlorine - yellow;
 - (5) Sulfur Dioxide - lime green with yellow bands;
 - (6) Sewage - grey;
 - (7) Compressed air - light green;
 - (8) Heated water - blue with 6 inch red bands spaced 30 inches apart;
 - (9) Power conduit - in compliance with the National Electric Code;
 - (10) Reclaimed water - purple;
 - (11) Instrument air - light green with dark green bands;
 - (12) Liquid alum - yellow with orange bands;
 - (13) Alum (solution) - yellow with green bands;
 - (14) Ferric chloride - brown with red bands;
 - (15) Ferric sulfate - brown with yellow bands;
 - (16) Polymers - white with green bands;

- (17) Ozone - stainless steel with white bands;
- (18) Raw water – tan; and
- (19) Effluent after clarification – dark green.

Adopted August 6, 2008 Effective August 28, 2008

In Chapter 10, MOP No. 8, Materials of Construction and Corrosion Control, Table 10.25 includes recommended painting colors for pipeline identification within a wastewater treatment plant. A selection of those recommendations includes:

“TABLE 10.25 Recommended color code WWTPs and pumping stations.*

Service	Stencil (1.25-m [4-ft] intervals as necessary with directional arrow)	Code
Diluting water	Dilut. Wat.	Purple
Nonpotable water	Non. Pot. Wat.	Purple
Grit washer piping	G.W.P.	Purple
Sanitary vents	San. Vent.	Purple
Sealing water	Slg. Wat.	Purple
Sanitary water	San. Waste	Grey
Potable main water	Pot. Wat.	Blue
Cold domestic water	Cold Dom. Wat.	Blue
Hot domestic water	Hot Dom. Wat.	Blue
Chilled water supply	C.W.S.	Blue
Chilled water return	C.W.R.	Blue
Chilled water condensate	C.W. Cond.	Blue
Chlorine	CL2	Yellow
Steam line	Stm. Line	Yellow
Steam condensate	Stm. Cond.	Yellow
Compressed air	Comp. Air	Green
Vacuum lines	Vac. Lines	Green
Nonpotable fire hydrants	Non-potable	Purple
Potable fire hydrants	Potable	Blue

*Unpainted items include stainless steel, aluminum, valve stems or moving parts, PVC pipe, and identification tags or plates. In corrosive areas, cupreous metals are subject to deterioration. Copper piping or tubing, including fittings and hangers, shall have applied covering against deterioration even if insulation is not required for other reasons.”

Chapter 8 of MOP 8 identifies purple to designate radiation hazards, and while that is the color used in the nuclear industry to designate piping containing radioactive water, there are few wastewater plants with liquid radiation hazards, and nearly all wastewater plants utilize reclaimed water within the plant. It would be more appropriate for WEF MOP Chapter 8 to

designate purple for reclaimed water and eliminate the jade green color reference to non-potable process or flushing water. In Chapter 10, non-potable water should be referred to as reclaimed or recycled water. The five listed processes could all be supplied with reclaimed water to simplify reference codes. Chilled water system pipe designation by blue may also deserve some consideration, as these systems do not always contain potable water, so WEF could be creating a potential for cross connection with this designation. The suggestion of yellow to designate both chlorine and steam lines could also create a safety hazard and could be in conflict with the national plumbing codes if locally enforced. Finally, wastewater utilities typically use the APWA standard of green to designate sanitary sewer pipes. WEF Chapters 8 and 10 define green to identify compressed gas, while selecting gray for wastewater or sanitary waste.

Another color conflict relates to pipe color coding for graywater. When Chapter 285 was in development, AWWA/WEF/WRA joint committees developed comments to TCEQ in response to the draft regulations. One of the 2004 comments was:

- Color-coding graywater system piping to identify it as containing non-potable water is necessary to ensure public safety, and HB-2661 designates the use of purple pipe, purple tape, or similar markings as a means to accomplish this. However, the system requirements and treatment methods are different for Type I or II reclaimed water and graywater. Color-coding both types of systems in the same manner can create confusion for those tasked with the maintenance, operation, or inspection of these different systems.

WEF, TCEQ and the American Public Works Association (APWA) Uniform Color Code (ANSI Z535.1) are in conflict with the UPC and IPC national plumbing codes. Both national plumbing codes identify green as the appropriate color code on-site and in buildings for potable water. This is directly opposite the training of utility engineers (APWA Code) that blue designated potable water and green designates wastewater. The APWA code also identifies purple for reclaimed water. The obvious conflict will occur in treatment plant work if there is a city or plumbing inspector that enforces a plumbing code requiring green pipe for potable water use on a wastewater treatment plant site that is required by TCEQ to use green for wastewater and blue for potable water. If 217.321(a) is followed, then cold, hot and chilled supply, return and condensate should also be blue according to WEF. All would be in violation of the plumbing code.

Committees for AWWA/WEF and WRA have been working since 2008 to reverse decisions by IAPMO and ICC to require purple as the pipe color code for all non-potable water onsite. The basis of this utility response is that all non-potable water is not equal in quality. Reclaimed water produced by utilities is monitored to meet state mandated standards and controlled by the utility until transferred to the user under a formal agreement. In contrast, graywater (wastewater), harvested rainwater, stormwater and condensate typically do not meet the Texas Type I or Type II reclaimed water standards. If multiple quality water is carried onsite in purple pipes, it is likely that cross connections could occur and a utility supplied reclaimed water

quality be contaminated by other onsite waters. The text labeling required in 217.329(d) is also in conflict with wording required by both national plumbing codes.

The conflict with potable water pipe color designation is more serious and neither national plumbing code organization has chosen to address the potable water pipe color conflict. This may be outside the 217 context but should be addressed.

Proposed Solutions

1. Emphasis that blue pipe is the color designation for potable water and enjoin enforcement of any local plumbing code that may adopt any other color.
2. Emphasis that green is the color for all wastewater and onsite water not meeting the state quality standards and monitoring standards of Chapter 210 Type II or Type I reclaimed water, depending on the use of the water. Enjoin enforcement of any local plumbing code that may adopt any other pipe color for non-potable water not in compliance with Chapter 210 Type I or Type II reclaimed water.
3. Change 217.329 (e) (6) color for sewage from gray to green.
4. Change 217.329 (e) (7) color for compressed air to an alternate color to eliminate confusion with wastewater piping.
5. Clarify 217.329 (e) (10) color purple applies only to municipally treated and controlled reclaimed water.