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PWS\_CG\_Travis\_CO\_20180828\_Clarification

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
*Protecting Texas by Reducing and Preventing Pollution*

August 28, 2018

Mr. Michael Sadar  
Research and Development Manager  
Lovibond Water Testing, Tintometer Group  
2108 Midpoint Drive  
Fort Collins, Colorado 80525

Subject: Clarification for the Use of an Alternative Technology to Monitor the Turbidity in Water Produced by Membrane Units

Dear Mr. Sadar:

On February 16, 2018, the Texas Commission on Environmental Quality (TCEQ) received your email dated February 15, 2018, with supporting information requesting the approval to use an alternative membrane turbidity monitor method to the Hach FilterTrak Method 10133 specified in Title 30 of the Texas Administrative Code (30 TAC) §290.42(g)(3)(C) and 30 TAC §290.111(f)(3)(B) for individual filter effluent turbidity measurements from membrane units provided for pathogen removal. The request is for the use of the following on-line Red LED and laser turbidimeters manufactured by Lovibond Water Testing, Tintometer Group, which do not utilize Hach FilterTrak (FT) Method 10133:

- Lovibond PTV 2000 (on-line Red LED); and
- Lovibond PTV 6000 (laser).

Your submittal included methods for the Lovibond PTV turbidimeters, a PTV series instrument manual, test site data and a validation study report submitted to the Environmental Protection Agency (EPA) for the approval of alternative test procedures for the analysis of contaminants under the Safe Drinking Water Act. In addition, Federal Register, Vol. 82, No. 143, Thursday, July 27, 2017, Rules and Regulations was also submitted and contains EPA approval for the Lovibond PTV 2000 and PTV 6000 turbidimetric methods. The TCEQ evaluated the information submitted by Lovibond to consider the use of the Lovibond turbidity measurement methods as alternative membrane turbidity monitor methods to the Hach FT Method 10133.

Based on our review of the supporting information you have submitted, the proposed Lovibond methods and turbidimeters described below are **approved** by the TCEQ as alternative membrane turbidity monitor methods and technology for individual filter effluent turbidity measurements from membrane units provided for pathogen removal, as per 30 TAC §290.42(g)(3)(C) and §290.111(f)(3)(B). A public water system (PWS) will not be required to submit an exception request to the TCEQ Technical Review and Oversight Team for the use of the TCEQ approved Lovibond methods and turbidimeters listed below:

- The Lovibond 660-nm LED Method, Revision 1.0, December 28, 2016, using the Lovibond PTV 2000 (on-line LED) turbidimeter; and
- The Lovibond 6000 Laser Method, Revision 1.0, December 28, 2016, using the Lovibond PTV 6000 (laser) turbidimeter.

**Site Specific Design, Operation, Maintenance and Reporting Requirements**

The TCEQ has determined that to satisfy the intent of 30 TAC §290.42(g)(3)(C) and §290.111(f)(3)(B), PWSs that utilize a TCEQ approved Lovibond turbidimeter will be required to meet TCEQ’s rules to use an alternative membrane-turbidity-monitor. The following requirements apply to the use of a Lovibond PTV 2000 and PTV 6000 turbidimeter used by a Texas PWS to meet the indirect integrity monitoring requirements for individual filter effluent turbidity measurements from membrane units provided for pathogen removal stated in 30 TAC §290.42(g)(3)(C) and §290.111(f)(3)(B):

- This TCEQ alternative membrane-turbidity-monitor method approval applies only to the Lovibond methods and turbidimeters stated in this approval letter. The approval does not apply to future revisions of the Lovibond methods and does not apply any design changes to the PTV 2000 and PTV 6000 turbidimeters;
- Accuracy of an alternative turbidity method turbidimeter must be verified once every seven (7) days, as per 30 TAC §290.46(s)(2)(B)(iv) and TCEQ Regulatory Guidance (RG) document 211, Monthly Testing and Reporting at Surface Water Treatment Plants, Section 7.2 Calibrating Instruments and Other Equipment (Enclosure 1);
- Calibration of the alternative turbidity method turbidimeter must be performed once every ninety (90) days, as per 30 TAC §290.46(s)(2)(B)(iii) and must meet Quality Control Sample (QCS) criteria specified in the vendor methods;
- Records of calibrations and verifications must be maintained onsite by a PWS for a period of at least three (3) years and be available for TCEQ staff to review upon request as per 30 TAC §290.46(f)(3)(B)(iv);
- Individual Filter Effluent (IFE) readings must be maintained by a PWS for a period of at least five (5) years and be available for TCEQ staff to review upon request as per 30 TAC §290.46(f)(3)(C)(iv); and
- Records of a PWS’s turbidity monitoring data must be recorded in the PWS Monthly Operating Reports (MOR) and the PWS is required to keep the MOR onsite for ten years, in accordance with 30 TAC §290.46(f)(3)(E)(i). MORs are required to be available for TCEQ staff to review upon request.

**Basis for Approving the Request**

30 TAC §290.46(s)(2)(B)(iv) contains a provision which allows for the use of a comparison method to verify the accuracy of an online turbidimeter. Guidance for the comparison method in 30 TAC §290.46(s)(2)(B)(iv) is detailed in Section 7.2 of RG - 211. RG - 211 provides a method for comparing on-line turbidimeters with bench top turbidimeters but does not provide criteria for comparing on-line turbidimeters in use on membrane units with other on-line turbidimeters. The TCEQ used the RG-211 comparison criteria as the basis for determining comparison criteria when the instruments being compared are on-line turbidimeters for use on membrane systems provided for pathogen removal. For the studies summarized in this letter, the criteria in RG-211 was adjusted to account for the low turbidity levels found in water treated by membrane units and the low regulatory turbidity trigger levels set by EPA and TCEQ (see Figure 1).

**Figure 1: Comparison Criteria used to Analyze Alternative Turbidity Methods for Individual Filter Effluent Turbidity Measurements from Membrane Units Provided for Pathogen Removal**

NTU Range	Requirement
≤1.0 NTU	On-line turbidimeter reading cannot differ by more than 0.05 NTU from a reference turbidimeter reading (±0.05 NTU difference).
>1.0 NTU	On-line turbidimeter reading cannot differ by more than 10% from a reference turbidimeter reading (±10% difference).

The decision to approve these turbidimeters for use by Texas PWSs for individual filter effluent turbidity measurements from membrane units provided for pathogen removal was based on the following substantiated documentation. This documentation was used to determine if the Lovibond PTV 2000 and PTV 6000 turbidimeters generated results that are comparable to a Hach FT 660 turbidimeter.

- Mr. Michael Sadar, Research and Development Manager of Lovibond Water Testing, submitted the following information for the PTV series turbidimeters:
  - The Lovibond 660-nanometer (nm) LED Method, Revision 1.0, December 28, 2016, for the Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 2000 660-nm LED Turbidimeter.
  - The Lovibond 6000 Laser Method, Revision 1.0, December 28, 2016, for the Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 6000 Laser Turbidimeter.
  - The Federal Register, Vol. 82, No. 143, Thursday, July 27, 2017, where the Lovibond PTV 2000 and the Lovibond PTV 6000 methods are approved by the EPA as “equally effective relative to the Hach FilterTrak Method 10133.”
  - The Lovibond Water Testing, Process Turbidimeter, PTV Series Turbidimeter Manual, Volume 2, February 2018. The manual contains specifications, operation details, calibration, and calibration verification instructions for the Lovibond PTV 2000 and 6000 turbidimeters.
  - An Alternate Test Procedure (ATP) Validation Study Report for the Measurement of Drinking Water Turbidity up to 10 NTU using the Candidate Lovibond Turbidity Methods, Represented by the PTV 1000, PTV 2000, and PTV 6000 Turbidimeters. December 20, 2016. This is the validation study submitted by Lovibond to the EPA, which summarizes results obtained from the comparison of Lovibond PTV series turbidimeters with a turbidimeter using the EPA approved Hach Filter Trak Method 10133. The Federal Register, Vol. 82, No. 143, Thursday, July 27, 2017, Rules and Regulations document denotes the Lovibond Validation Study Report as the source of the information used to base the EPA approval of the Lovibond methodologies as “equally effective relative to the Hach FilterTrak Method 10133.”
  - Response summary graphs displaying data comparison of all turbidimeters in a study.
  - Photos of turbidimeter screens displaying calibration related results and instrument set-up.
  - Test site data from Fort Collins, Colorado, San Patricio Municipal Water District (TCEQ PWS ID: 2050011), and Binney South Platte (City of Aurora, Colorado). The San Patricio Municipal Water District (MWD) facility is a membrane plant. The Fort Collins, Colorado facility is a conventional filtration plant with flocculation coagulation and multi-media filtration which treats surface water.

The test site data is a supplement to the ATP Validation Study Report. The Validation Report contains a “Data Analysis and Discussion” section which summarizes data comparisons, and the test site data is the raw data presented in Excel spreadsheets. Please note that the TCEQ did not use the Binney South Platte (City of Aurora, Colorado) data in our review as the turbidity levels were not in the range seen at membrane plants. The test site data includes the following:

- Quality assurance information, to include standard preparation and analytical results for calibration verification and quality control standards;
- Spike recovery comparisons between the Lovibond PTV 2000, PTV 6000 and a Hach FT 660 turbidimeter.

**Fort Collins, Colorado Comparison:** The results of the tests conducted at the Fort Collins site are summarized in Tables 1 through 3. The data included a total of 61 measurements made using primary standards to create solutions containing 0.0352, 0.0673 and 0.1170 NTU (theoretical turbidity concentrations).

**Table 1: Comparison of 0.0352 NTU Theoretical Turbidity Concentration from Hach FT 660, Lovibond 2000, and Lovibond 6000 turbidimeters**

Turbidimeter	Average Result of 0.0352 NTU Standard	0.0352 NTU Range of %Recovery	%Difference from Hach FT 660 (AVG)	Minimum %Difference from Hach FT 660	Maximum %Difference from Hach FT 660
Hach FT 660	0.0352 NTU	n/a	n/a	n/a	n/a
Lovibond PTV 2000	0.0419 NTU	117.4 - 121.3%	6.22% or 0.0025 NTU	4.92% or 0.0020 NTU	7.70% or 0.0032 NTU
Lovibond PTV 6000	0.0409 NTU	115.0 - 117.2%	3.38% or 0.0015 NTU	2.56% or 0.0011 NTU	4.36% or 0.0019 NTU

**Table 2: Comparison of 0.0673 NTU Theoretical Turbidity Concentration from Hach FT 660, Lovibond 2000, and Lovibond 6000 turbidimeters**

Turbidimeter	Average Result of 0.0673 NTU Standard	0.0673 NTU Range of % Recovery	%Difference from Hach FT 660 (AVG)	Minimum % Difference from Hach FT 660	Maximum % Difference from Hach FT 660
Hach FT 660	0.0705 NTU	n/a	n/a	n/a	n/a
Lovibond PTV 2000	0.0738 NTU	108.7 - 110.6%	4.61% or 0.0034 NTU	3.44% or 0.0025 NTU	5.81% or 0.0042 NTU
Lovibond PTV 6000	0.0720 NTU	101.7 - 108.2%	2.20% or 0.0016 NTU	0.02% or 0.00002 NTU	3.15% or 0.0024 NTU

**Table 3: Comparison of 0.1170 NTU Theoretical Turbidity Concentration from Hach FT 660, Lovibond 2000, and Lovibond 6000 turbidimeters**

Turbidimeter	Average Result of 0.1170 NTU Standard	0.1170 NTU Range of %Recovery	%Difference from Hach FT 660 (AVG)	Minimum % Difference from Hach FT 660	Maximum % Difference from Hach FT 660
Hach FT 660	0.1226 NTU	n/a	n/a	n/a	n/a
Lovibond PTV 2000	0.1240 NTU	102.1 - 107.3%	1.31% or 0.0016 NTU	0.03% or 0.00004 NTU	2.48% or 0.0031 NTU
Lovibond PTV 6000	0.1229 NTU	103.6 - 106.0%	0.55% or 0.0007 NTU	0.02% or 0.00002 NTU	1.66% or 0.0021 NTU

The spike recovery comparisons at 0.0352, 0.0673, and 0.1170 NTU demonstrate that at turbidity levels below 0.15 NTU, the PTV 2000 and PTV 6000 turbidimeters **produce comparable results** to a Hach FT 660 turbidimeter. The maximum NTU difference documented in the 0.0352, 0.0673, and 0.1170 NTU comparisons is 0.0042 NTU, which is well below the 0.05 NTU turbidimetric comparison criteria stated in Figure 1 for this study.

Table 4: Fort Collins Quality Control Samples: 0.310 and 1.01 NTU

Turbidimeter	Hach FT 660	Lovibond PTV 2000	Lovibond PTV 6000	Hach 2100AN
0.310 NTU After Calibration/ Difference from Hach 2100AN (Diff)	0.307 NTU/ 0.033 NTU	0.317 NTU/ 0.023 NTU	0.309 NTU/ 0.031 NTU	0.340 NTU/ n/a
0.310 NTU Before Replicates/ Diff	0.305 NTU/ 0.026 NTU	0.315 NTU/ 0.016 NTU	0.317 NTU/ 0.014 NTU	0.331 NTU/ n/a
0.310 NTU After Replicates / Diff	0.315 NTU/ 0.015 NTU	0.352 NTU/ 0.022 NTU	0.321 NTU/ 0.009 NTU	0.330 NTU/ n/a
1.01 NTU After Calibration/ Diff	1.009 NTU/ 0.001 NTU	1.025 NTU/ 0.015 NTU	1.023 NTU/ 0.013 NTU	1.01 NTU/ n/a
1.01 NTU Before Replicates/ Diff	0.999 NTU/ 0.011 NTU	1.028 NTU/ 0.018 NTU	1.024 NTU/ 0.014 NTU	1.01 NTU/ n/a
1.01 NTU After Replicates / Diff	0.972 NTU/ 0.028 NTU	1.051 NTU/ 0.051 NTU	1.012 NTU/ 0.012 NTU	1.00 NTU/ n/a

In addition, the following was noted regarding the 0.310 and 1.01 NTU quality control sample (QCS) analyses detailed in Table 4:

- The Hach FT 660 turbidimeter was calibrated with a 0.810 NTU primary standard prepared from a 4000 NTU formazin stock standard;
- The Lovibond PTV 2000 and 6000 turbidimeters were calibrated with a 5.01 NTU primary standard prepared from a 4000 NTU formazin stock solution;
- The 0.310 and 1.01 NTU QCS samples were prepared from a 4000 NTU formazin stock solution;
- When evaluated using the established comparison criteria in Section 7.2 of TCEQ RG-211, where online turbidimeter readings are compared to a calibrated bench-scale turbidimeter (Hach 2100AN) reading, the following was observed:
  - All of the Hach 2100AN readings were less than 1.04 ( $\leq 1.0$ ) NTU, thus the  $\pm 0.10$  NTU limit stated in RG-211 was applied. All of the Lovibond and Hach FT660 readings yielded differences less than the 0.10 NTU limit, with a maximum difference of 0.051 NTU;
- The Lovibond PTV 2000 and 6000 QCS readings were also compared to their respective Hach FT 660 readings using the Figure 1 study criteria of  $\pm 0.05$  NTU difference for readings less than 1.04 ( $\leq 1.0$ ) NTU.
  - All of the Hach FT 660 readings were less than 1.04 ( $\leq 1.0$ ) NTU, thus the  $\pm 0.05$  NTU limit stated in Figure 1 of this letter was applied. All of the Lovibond turbidity readings yielded differences of less than 0.05 NTU, with the exception of the Lovibond 2000 "After Replicates" difference of 0.079 NTU. The 0.079 NTU difference would indicate the need for the recalibration of the Lovibond 2000 turbidimeter;
- All on-line turbidimeter QCS readings were compared to a benchtop Hach 2100AN turbidimeter; and
- The use of the Hach 2100AN turbidimeter meets the calibration requirements stated in Section 7.2 of TCEQ RG-211.

**San Patricio MWD comparison:** Comparability studies were performed on spiked stabilized sedimentation water / membrane effluent water at 0.0697 and 0.1761 NTU (average turbidity levels). Twenty-three (23) and fifty-nine (59) replicates were analyzed, respectively. In addition, 1923 replicates of unspiked membrane effluent water were also analyzed. The average turbidity level NTU is based on the Hach FT 660 readings. The results of these special studies are shown in Table 5 through Table 7 below.

Table 5: Average Turbidity Level: 0.0697 NTU

Turbidimeter	Average Result of 0.0697 NTU Standard	0.0697 NTU Range of %Recovery	% Difference from Hach FT660 (AVG)	Minimum % Difference from Hach FT660	Maximum % Difference from Hach FT660
Hach FT 660	0.0697 NTU	n/a	n/a	n/a	n/a
Lovibond PTV 2000	0.0804 NTU	111.7 - 117.1%	14.3% or 0.0107 NTU	10.3% or 0.0076 NTU	17.6% or 0.0129 NTU
Lovibond PTV 6000	0.0764 NTU	108.3 - 111.9%	8.01% or 0.0068 NTU	4.82% or 0.0041 NTU	10.8% or 0.0091 NTU

Table 6: Average Turbidity Level: 0.1761 NTU

Turbidimeter	Average Result of 0.1761 NTU Standard	0.1761 NTU Range of % Recovery	% Difference from Hach FT660 (AVG)	Minimum % Difference from Hach FT660	Maximum % Difference from Hach FT660
Hach FT 660	0.1761 NTU	n/a	n/a	n/a	n/a
Lovibond PTV 2000	0.1826 NTU	102.2 - 112.3%	3.74% or 0.0068 NTU	0.12% or 0.0002 NTU	14.0% or 0.0256 NTU
Lovibond PTV 6000	0.1852 NTU	99.8 - 110.6%	4.93% or 0.0092 NTU	0.14% or 0.0002 NTU	11.4% or 0.0218 NTU

Table 7: Average Turbidity Level: 0.0108 NTU (Unspiked Membrane Effluent Water)

Turbidimeter	Average Result of 0.0108 NTU Standard	0.0108 NTU Range of % Recovery	% Difference from Hach FT660 (AVG)	Minimum % Difference from Hach FT660	Maximum % Difference from Hach FT660
Hach FT 660	0.0108 NTU	n/a	n/a	n/a	n/a
Lovibond PTV 2000	0.0125 NTU	111.5 - 125.8%	14.6% or 0.0017 NTU	10.4% or 0.0012 NTU	22.6% or 0.0027 NTU
Lovibond PTV 6000	0.0101 NTU	92.6 - 100.2%	3.16% or 0.0007 NTU	0.68% or 0.0002 NTU	3.81% or 0.0008 NTU

The 0.0697 and 0.1761 NTU spike recovery comparisons and the unspiked membrane filter effluent water comparisons demonstrate that at turbidity levels below 0.1761 NTU, the PTV 2000 and PTV 6000 turbidimeters **produce comparable results** to a Hach FT 660 turbidimeter. The maximum NTU difference documented in the 0.0108, 0.0697, and 0.761 NTU comparisons is 0.0256 NTU, which is well below the 0.05 NTU turbidimetric comparison criteria stated in Figure 1 of this letter for this study.

Table 8: San Patricio Quality Control Samples: 0.300 and 1.01 NTU

Turbidimeter	Hach FT 660	Lovibond PTV 2000	Lovibond PTV 6000	Hach 2100AN
0.300 NTU After Calibration/ Difference from Hach 2100AN (Diff)	0.291 NTU/ 0.049 NTU	0.304 NTU/ 0.036 NTU	0.304 NTU/ 0.036 NTU	0.340 NTU/ n/a
0.300 NTU After Replicates / Diff	0.301 NTU/ 0.049 NTU	0.308 NTU/ 0.042 NTU	0.308 NTU/ 0.042 NTU	0.350 NTU/ n/a
1.01 NTU After Calibration/ Diff	0.950 NTU/ 12.0%	1.009 NTU/ 6.6%	0.998 NTU/ 7.6%	1.08 NTU/ n/a
1.01 NTU After Replicates / Diff	0.992 NTU/ 7.3%	1.012 NTU/ 5.4%	1.025 NTU/ 4.2%	1.07 NTU/ n/a

In addition, the following was noted regarding the 0.300 and 1.01 NTU QCS analyses detailed in Table 8:

- The Hach FT 660 turbidimeter was calibrated with a 0.810 NTU primary standard prepared from a 4000 NTU formazin stock standard;
- The Lovibond PTV 2000 and 6000 turbidimeters were calibrated with a 5.01 NTU primary standard prepared from a 4000 NTU formazin stock solution;
- The 0.310 and 1.01 NTU QCS samples were prepared from a 4000 NTU formazin stock solution;
- When evaluated using the established comparison criteria in Section 7.2 of TCEQ RG-211, where online turbidimeter readings are compared to a calibrated bench-scale turbidimeter (Hach 2100AN) reading, the following was observed:
  - For the Hach 2100AN turbidimetric readings less than 1.04 ( $\leq 1.0$ ) NTU, the  $\pm 0.10$  NTU limit stated in RG-211 was applied. All of the Lovibond reading differences were less than the 0.10 NTU limit, with a maximum difference of 0.049 NTU; and
  - For the Hach 2100AN turbidimetric readings greater than 1.04 ( $> 1.0$ ) NTU, the  $\pm 10\%$  difference limit stated in RG-211 was applied. All of the Lovibond reading differences were less than the  $\pm 10\%$  limit, with a maximum difference of 7.6%. The TCEQ does note that the Hach FT 660 "After Calibration" reading of the 1.01 NTU standard yielded a reading which varied by 12.0% from the respective Hach 2100AN reading, which would indicate the need for the recalibration of the Hach FT 660;
- The Lovibond PTV 2000 and 6000 QCS readings were also compared to their respective Hach FT 660 readings using the Figure 1 study criteria of  $\pm 0.05$  NTU difference for readings less than 1.04 ( $\leq 1.0$ ) NTU.
  - All of the Hach FT 660 readings were less than 1.04 ( $\leq 1.0$ ) NTU, thus the  $\pm 0.05$  NTU limit stated in Figure 1 of this letter was applied. All of the Lovibond turbidity readings yielded differences of less than 0.05 NTU, with the exception of the Lovibond 2000 "After Calibration" difference of 0.059 NTU. The 0.059 NTU difference would indicate the need for recalibration of the Lovibond 2000 turbidimeter; and
- The use of the Hach 2100AN turbidimeter meets the calibration requirements stated in Section 7.2 of TCEQ RG-211.

- Email correspondence on April 11, 2018 from Mr. Mike Sadar, which provided clarification regarding the following:
  - Lovibond does issue certificates of analysis for Lovibond calibration standards. Lovibond implements a proprietary method to assign verification standard NTU concentrations;
  - Blank correction in submitted data was performed due to an EPA request as part of the EPA alternate test procedure (ATP). Baseline blank determinations were made by consecutive measurements; and
  - Lovibond PTV 6000 turbidimeter information has been incorporated into a PTV series manual. Support for the PTV turbidimeters will be provided by Lovibond representatives and the Lovibond website, which will be updated as customer service tools, such as troubleshooting videos, are created by Lovibond.

**Conclusion:** The comparability studies data indicates that the PTV 2000 and PTV 6000 are adequate for meeting the requirements in 30 TAC §290.111(f)(2)(D)(v) for reading turbidity levels in the 0.15 NTU range for direct integrity testing of a membrane unit.

### **Approval for Use in Texas**

Please provide a copy of this letter to each of your Texas PWS customers. This letter is **not** to be construed as:

- Approval of future revisions to the TCEQ approved Lovibond methods or design changes to the approved turbidimeters;
- Approval of software updates. If there are software updates that impact the method, this TCEQ approval does not cover future revisions of the TCEQ approved Lovibond methods;
- TCEQ approval for a Texas PWS to use unapproved Lovibond turbidimeters to report regulatory individual filter effluent turbidity data from water produced by a membrane unit used for pathogen removal, or
- Approval of changes to a membrane filtration plant. Prior to initiating changes to a treatment plant, a water system is required to notify the TCEQ of the changes, submit plan and specifications to the TCEQ Plan Review Team, and receive TCEQ approval. Plans and specification documentation (engineering documents and other public water system information) can be submitted directly to:

Ms. Vera Poe, P.E., Team Leader  
Plan Review Team (MC 159)  
Texas Commission on Environmental Quality  
P.O. Box 13087  
Austin, Texas 78711-3087

Additional information regarding the TCEQ plans and specification process is available on the TCEQ website:

<https://www.tceq.texas.gov/drinkingwater/planrev.html>



Mr. Michael Sadar  
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If you have any questions concerning this letter, or if we can be of additional assistance, please contact Mr. Richard Bosch, at [Richard.Bosch@tceq.texas.gov](mailto:Richard.Bosch@tceq.texas.gov), by telephone at (512) 239-3465, or by correspondence at the following address:

Technical Review & Oversight Team (MC 159)  
Texas Commission on Environmental Quality  
P.O. Box 13087  
Austin, Texas 78711-3087

Sincerely,



Joel Klumpp, Manager  
Plan & Technical Review Section  
Water Supply Division  
Texas Commission on Environmental Quality

JKK/rb

cc: Mr. Danny Hutcherson, C.C. Lynch & Associates, Inc., 300 Davis Avenue, Pass Christian,  
Mississippi 39571

bcc: TCEQ Waco Regional Office - R9