Requesting an Exception to the Clarification Unit Hydraulic Detention Time (HDT) or Surface Overflow Rate (SOR)

Using a Hydraulic Detention Time (HDT) that is lower than, or Surface Overflow Rate (SOR) higher than those specified in Title 30 of the Texas Administrative Code (30 TAC) §290.42(d)(10) requires an exception. The TCEQ Technical Review and Oversight Team (TROT) staff requests the following data and operating parameters to be monitored and recorded at the specified frequencies and reported to the TCEQ for verification that the requested clarification HDT and SOR will not contribute to the degradation of potable water quality or quantity.

The TROT staff strongly recommends that a pilot-study or full-scale demonstration protocol be submitted for review and approval prior to the actual demonstration. This will allow TROT to include all the information that needs to be collected and reported.

To request an exception to this rule, **a protocol must be submitted and approved prior to the start of any study.** Please supply the following information to:

Technical Review and Oversight Team (MC 159)

Texas Commission on Environmental Quality

P.O. Box 13087

Austin, TX 78711-3087

There are three (3) possible HDT/SOR exception request scenarios, each discussed below separately:

1. A pilot study of a down-sized clarification unit prior to the approval and installation of a full-scale, modified unit(s);
2. A full-scale demonstration at an established surface water treatment plant (SWTP) specifically for re-rating of the SWTP treatment capacity by the lowering of the HDT or increase of the SOR; or
3. A temporary exception, allowing for the further approval, from TCEQ Plan Review Team (PRT), of new or modified clarification equipment (for example the addition of tube or plate settlers). The temporary exception will have a deadline at which time the full-scale demonstration must be completed and approved by TCEQ. If the temporary exception is not completed within the allowed time, the exception will expire, and a new exception request will be required.

I. Clarification Unit HDT/SOR Pilot Study Protocol

A protocol for a pilot-scale clarification unit must include the following information:

* The maximum raw water turbidity level during the pilot-scale study must be representative of the historical high observed at the existing SWTP during the last five years.
* The submitted pilot study report for the requested HDT/SOR must contain at least **30 days** of data, for a minimum period of eight hours per day. The 30 days do not need to be consecutive.
* The as-built dimensions of each clarification unit must be reported.
* At least one associated mixing and flocculation unit must be in operation at a flow rate that corresponds to the SWTP’s resulting full-scale production at the requested clarification HDT/SOR.
* The raw water turbidity, pH, temperature, and alkalinity levels must be monitored at least once each day and at any time it is suspected that the raw water quality may have changed.
* The pretreatment chemicals being fed and each of their dosage levels must be reported for each eight-hour period.
* The settled water pH level and flow rate must be monitored at least once each eight-hour shift the piloted clarification basin is in operation.
* The as-built water volumes of the associated flocculation and clarification units and the surface area of the settling zone must be provided for each piloted clarification unit. For each recorded flow rate, the corresponding HDT/SOR must be calculated and submitted.
* The settled water turbidity level during the pilot-scale study must be monitored at a frequency equal to the HDT of the piloted clarification units operated at the requested clarification HDT/SOR.
* Submit data indicating how the plant will ensure that proportioned flow is delivered to each pilot-scale clarification unit. If flow measuring devices are used, they must have been calibrated in the last 12 months. If weirs are used, the level must be verified prior to beginning the clarification HDT/SOR pilot study.
* Quality assurance and quality control data must be provided regarding monitoring equipment calibration methods, frequencies of calibration, and analytical procedures used.
* All collected data must be reported in comparison tables and graphs. The pilot study report shall note and describe all changed operating parameters and discrepancies in the collected data.

**Pilot-scale study water may not be sent to distribution.**

**II. CLARIFICATION UNIT HDT/SOR PROTOCL FOR RE-RATING**

When a water system requests re-rating of the treatment plant capacity by reducing the HDT or raising the SOR, a full-scale demonstration allowing one clarification unit of each volume be operated at a higher flow rate must be conducted to determine if the settled water can remain below the required turbidity level. Please note the flowrate that is submitted will affect the HDT/SOR evaluated.

* The maximum raw water turbidity level during the full-scale study must be representative of the historical high observed at the existing SWTP during the last five years.
	+ The submitted full-scale study report for the requested HDT/SOR must contain at least **30 days** of data, at a minimum period of eight hours per day. The 30 days do not need to be consecutive.
* At least one clarification unit, of each size and type, must be in operation at the **requested or lower clarification HDT, or the requested or higher clarification SOR.**
* The as-built dimensions of each clarification unit must be reported.
* At least one associated mixing and flocculation unit must be in operation at a flow rate that corresponds to the SWTP’s resulting full-scale production at the requested clarification HDT/SOR.
* The raw water turbidity, pH, temperature, and alkalinity levels must be monitored at least once each day and at any time it is suspected that the raw water quality may have changed.
* The pretreatment chemicals being fed and each of their dosage levels must be reported for each eight-hour period.
* The settled water pH level and flow rate must be monitored at least once each eight-hour shift the piloted clarification basin is in operation.
* The as-built water volumes of the associated flocculation and clarification units and the surface area of the settling zone must be provided for each piloted clarification unit. For each recorded flow rate, the corresponding HDT/SOR must be calculated and submitted.
* The settled water turbidity level during the full-scale demonstration study must be monitored at a frequency equal to the HDT of the piloted clarification units operated at the requested clarification HDT/SOR.
* Submit data indicating how the plant ensures that proportioned flow is delivered to each clarification unit. If flow measuring devices are used, they must have been calibrated in the last 12 months. If weirs are used, the level must be verified prior to beginning the clarification HDT/SOR pilot study.
* Quality assurance and quality control data must be provided regarding monitoring equipment calibration methods, frequencies of calibration, and analytical procedures used.
* All collected data must be reported in comparison tables and graphs. The full study report shall note and describe all changed operating parameters and discrepancies in the collected data.
* The water being tested may flow through the subsequent treatment units and may be sent to distribution unless:
* **during the full-scale demonstration clarification HDT/SOR study the individual filter effluent (IFE) or combined filter effluent (CFE) turbidity readings violate any treatment technique requirements for turbidity as specified in Section §290.111, the finished water must not be sent to distribution.**
* **during the full-scale demonstration clarification HDT/SOR study the disinfectant residuals are less than those required to achieve the required inactivation of *Giardia lamblia* and viruses for the current water quality conditions and flow rates, the finished water must not be sent to distribution.**

**III. CLARIFICATION UNIT HDT/SOR TEMPORARY EXCEPTION PROTOCL FOR FURTHER TCEQ APPROVAL**

When a temporary exception to 30 TAC §290.42(d)(10) for SOR or HDT is required in order for the PRT to approve the construction of the new or modified clarification units and the full-scale demonstration will not be completed until the new or modified units have been installed and the WTP is in normal operation. The full-scale demonstration must be completed within 12 months of installation of the equipment and the WTP is in normal operations.

* The submitted full-scale study report for the requested HDT/SOR must contain at least **30 days** of data, for a minimum period of eight hours per day. The 30 days do not need to be consecutive.
* At least one clarification unit, of each size and type, must be in operation at the **requested or lower clarification HDT, or the requested or higher clarification SOR.**
* The as-built dimensions of each clarification unit must be reported.
* At least one associated mixing and flocculation unit must be in operation at a flow rate that corresponds to the (SWTP’s resulting full-scale production at the requested clarification HDT/SOR.
* The raw water turbidity, pH, temperature, and alkalinity levels must be monitored at least once each day and at any time it is suspected that the raw water quality may have changed.
* The pretreatment chemicals being fed and each of their dosage levels must be reported for each eight-hour period.
* The settled water pH level and flow rate must be monitored at least once each eight-hour shift the piloted clarification basin is in operation.
* The as-built water volumes of the associated flocculation and clarification units and the surface area of the settling zone must be provided for each piloted clarification unit. For each recorded flow rate, the corresponding HDT/SOR must be calculated and submitted.
	+ The settled water turbidity level during the full-scale demonstration study must be monitored at a frequency equal to the HDT of the piloted clarification units operated at the requested clarification HDT/SOR.
	+ Submit data indicating how the plant ensures that proportioned flow is delivered to each clarification unit. If flow measuring devices are used, they must have been calibrated in the last 12 months. If weirs are used, the level must be verified prior to beginning the clarification HDT/SOR pilot study.
	+ Quality assurance and quality control data must be provided regarding monitoring equipment calibration methods, frequencies of calibration, and analytical procedures used.
* All collected data must be reported in comparison tables and graphs. The full study report shall note and describe all changed operating parameters and discrepancies in the collected data.
* The water being tested may flow through the subsequent treatment units and may be sent to distribution. If at any time during the full-scale demonstration clarification HDT/SOR study:
* **the individual filter effluent (IFE) or combined filter effluent (CFE) turbidity readings violate any treatment technique requirements for turbidity as specified in Section §290.111, the finished water must not be sent to distribution and / or**
* **the disinfectant residuals are less than those required to achieve the required inactivation of *Giardia lamblia* and viruses for the current water quality conditions and flow rates, the finished water must not be sent to distribution.**