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### Influent Characterization

Effective operation and control of a wastewater treatment facility (WWTF) requires that the operator to possess a thorough knowledge of the composition of the influent. To obtain that knowledge, raw wastewater is collected and analyzed. Laboratory results are a valuable record of plant operation. The data informs the operator how efficiently the plant is operating. The data can be used to troubleshoot problems and take corrective measures.

Characterization may require a few simple tests or several complex tests in a well-equipped laboratory such as Eastex Environmental Laboratory. Characterization can be broken down into physical, chemical, and biological characteristics.

The physical characteristics of wastewater include temperature, color, odor and turbidity.

Typical Concentration				
Analyte	Unit	Low	Medium	High
BOD	mg/L	110	190	350
COD	mg/L	250	430	800
NH3N	mg/L	20	30	50
TOC	mg/L	80	140	260
O&G	mg/L	50	90	100

Color of wastewater depends on the amounts and types of dissolved, suspended and colloidal matter present. Normal domestic wastewater is gray. Wastewater

becoming septic is darker, indicating the need for further aeration. Other colors typically indicate the presence of industrial discharges.

Odor is highly subjective and often fresh wastewater has a musty smell. Other times in the presence of hydrogen sulfide, it may smell like a rotten egg. Other wastewater odors, such as petroleum, solvents or other abnormal smells indicate industrial spill and possible threat to the WWTF. Caution is recommended because some compounds might be toxic!

Chemical Characteristics include alkalinity, chemical oxygen demand (COD), conductivity and pH. Biological characteristics include BOD, pathogen and microscopic examination.

The BOD test measures the amount of oxygen needed to biologically oxidize material in wastewater. The rate of BOD depends on temperature. The test provides a relative measure of the amount of food material available to the biological system, degree of stabilization of wastewater and prospective effect of the effluent on the receiving water.

BOD is typically a percentage of COD value. If you run the analysis on the same sample periodically a general percentage or trend will develop that will help detect if you are receiving an illicit discharge or change in flow from an industry. In such cases the BOD/COD ratio will usually drop due to a rise in the COD.

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Continued on page 2

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The reasons for developing a sampling and characterization program for a treatment plant include compliance with legal requirements, process monitoring and control, and historical data collection.

Legal Requirements: All WWTP operating under NPDES permit are required to conduct a sampling and analysis program. Each plant's NPDES specifies sampling location, type, frequency and analysis to be performed .

Process monitoring and control ensures an effective sampling program and provides information on loading and performance of each unit process. The data allows the operator to anticipate the need for operational adjustments based on changes in process performance and on review of past operating records.

Historical data benefits both plant operators and engineers. It helps to show trends and performance that can be used to predict when plant expansion or upgrading is needed, by evaluating the changes in the organic load placed on the plant. Another added benefit you can have is ability to calculate percent removal of BOD, TSS, NH3 by performing periodic influent testing to show effectiveness of the WWTF.

**Lead and Copper** Sampling 6M1 2016 Cycle has began. Please check if you are on the 6M1 schedule. If you need help, contact Eastex Lab.

Please let us know your **E.Coli or Entero** monitoring cycle. It is listed on your DMR form. Email or call us.

### Total Coliform Rule (RTCR) Revised by EPA: ALL Public Water Systems Must Comply By April 1 2016.

January 2016—The EPA updated 1989 Total Coliform Rule to increase public health protection. The revised rule establishes a maximum contaminant level for E. Coli and uses E. Coli and total coliforms to initiate a “find and fix” approach to prevent fecal contamination from entering the distribution system. The rule requires all public water systems (PWS) to monitor for the presence of total coliforms and E. Coli in the distribution system.

#### The rule changes include:

- ◆ Sample siting plan and repeat sampling and reporting requirements
- ◆ E.coli maximum contaminant level (MCL)
- ◆ Assessment requirements and deadlines
- ◆ Seasonal water system start-up procedures
- ◆ Treatment technique violations and reporting requirements
- ◆ Boil water notice and public notice requirements.

If you have not send your **permit** to us, please do so now, so we can help monitor your limits.

## On the horizon

Total Phosphorus is a growing concern and may be added to some permits. Knowing the Total Phosphorous level in the influent can help selecting the proper treatment technique for compliance.

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## Is your preservative expired?

Some analysis, such as ammonia and metals require preservative to be a valid sample. Dechlorinating compounds and diluted acid will deteriorate and expire after some time or may become contaminated. Be sure and review expiration dates of these chemicals and request replacements if needed. These are some items that TCEQ field inspectors will review and it is always good to beat them to the punch!