Fact-sheet – Effluent Treatment Plant (ETP) – Water quality testing

What is the objective?

The objective is to:

- **Control** the wastewater characteristics before, during and after the treatment to control and make sure the treatment process is adapted;
- **Ensure** the quality of water after treatment is within the limits as per law or as per the industry standard.

How to achieve this objective?

Step 1: Identify which water quality parameters should be tested before, during and after treatment.

Before treatment (ETP inlet)	During treatment	After treatment (ETP outlet)
➢ The untreated wastewater characteristics should have been known since the ETP construction project as the ETP has to be designed and built based on the pollution load of the wastewater to be treated. ➢ The parameters commonly checked at ETP inlet are: • pH, • TDS (Total dissolved solids), • Temperature, • DO (Dissolved oxygen), • BOD (Biological oxygen demand) • COD (Chemical oxygen demand) • Oil & grease.	➢ The ETP operation & maintenance manual should indicate which parameters the operator should test at which stages of the treatment. ➢ Testing of water parameters during the process is needed to control the effectiveness of the different treatment steps and to make adjustments if needed. ➢ The main important tests to be performed daily are: • pH in neutralization tank or before the aeration tank (biological process) • DO and Temperature in aeration tank • Mixed Liquor Volatile Suspended Solids (MLVSS) & (MLSS) in aeration tank	➢ The factory has to identify the **legal standards** applicable to its situation: industry standard if any, standard according to discharge point of wastewater after treatment (standard might be different if the wastewater goes to a sewer or to a natural source), local standard if any, etc. ➢ The factory might have to comply with other **standards as per its stakeholders requirements** (e.g. for textile, the buyers might ask the factory to comply with ZDHC Programme's Wastewater Guideline) ➢ Whatever is the law, the parameters tested at ETP inlet point should be tested at ETP outlet point to assess if the water quality after treatment expected is achieved.

Step 2: Define what should be the frequency of the testing. The frequency of testing should be indicated in the ETP operation & maintenance manual. Before treatment, the most important parameters to test are BOD and COD and they can be tested weekly (or monthly for BOD). After treatment, the factory has to refer to the legal requirements as a minimum and whatever is the law, it is recommended to follow this plan:

Daily	Weekly	Quarterly or twice a year
pH, color, DO	Temperature, COD and BOD (can be tested monthly if not possible weekly)	Heavy metals, ammonia, chromium, etc.

Step 3: Make sure you have all the instruments you need to perform the tests and make sure you have the testing procedures to test accurately each water quality parameter.

- **Request** calibration[1] certificates and testing procedures when you purchase testing instruments ;
- **Appoint** the ETP manager or a laboratory analyst to be in charge of the water testing and make sure he/she is qualified to collect the samples, perform the tests and report the data (see fact-sheet "ETP operator's skills and responsibilities").

[1] Calibrate: to check a measuring instrument to see if it is accurate (Source: Cambridge Dictionary). The calibration of an instrument/tool assures that the measurement errors are minor (the error range is kept within the desired limits).

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Common non-compliances

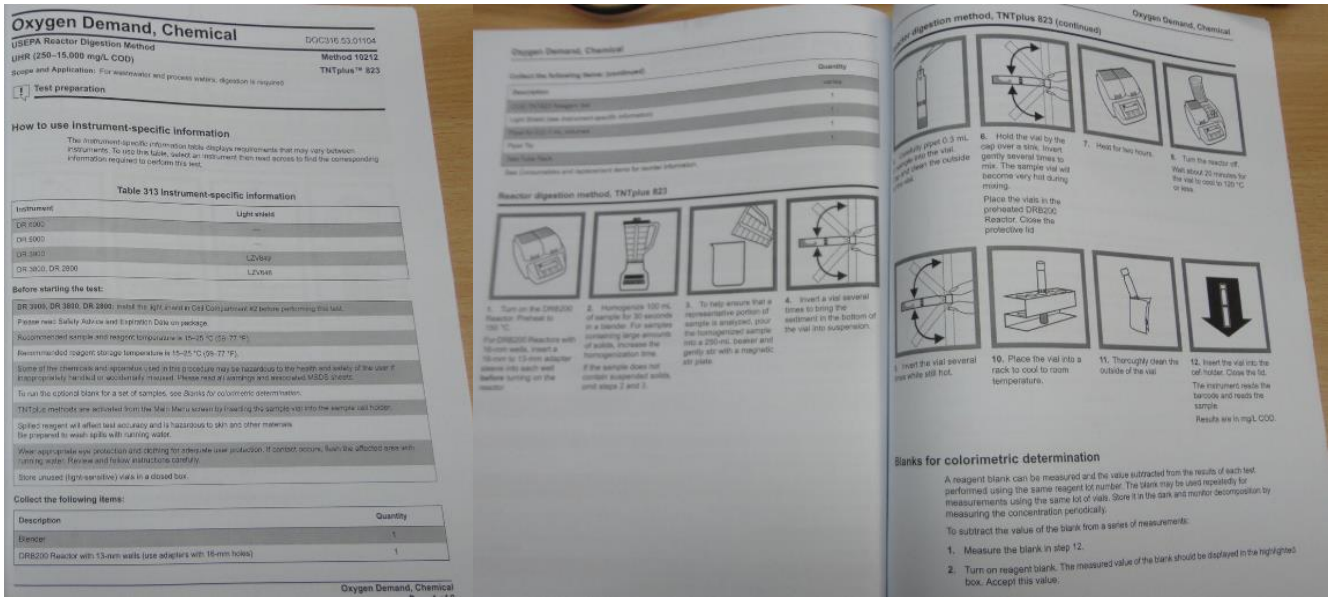
Water quality testing instruments not calibrated

The factory is using TDS and DO meters for the testing of the water quality after treatment but the ETP operator is not aware of the necessity to verify if the instruments are calibrated or not. Therefore, the results of the tests might not be accurate and reliable.

Good practices

The factory should have documented **instructions** about how to perform the water parameters tests.

For example, for the test of Chemical Oxygen Demand (COD), the below instructions can be kept by the ETP operator in the ETP laboratory:



Oxygen Demand, Chemical

USEPA Reactor Digestion Method

Method 10212

TNTplus™ 823

Test preparation

How to use instrument-specific information

Table 313 Instrument-specific information

Before starting the test:

Collect the following items:

Description | Quantity

Blender | 1

DRB200 Reactor with 13-mm wells (use adapters with 16-mm holes) | 1

Oxygen Demand, Chemical

Reactor digestion method, TNTplus 823

Reactor digestion method, TNTplus 823 (continued)

Oxygen Demand, Chemical

Blanks for colorimetric determination

A reagent blank can be measured and the value subtracted from the results of each test performed using the same reagent lot number. The blank may be used repeatedly for measurements using the same lot of vials. Store it in the dark and monitor decomposition by measuring the concentration periodically.

To subtract the value of the blank from a series of measurements:

1. Measure the blank in step 12.
2. Turn on reagent blank. The measured value of the blank should be displayed in the highlighted box. Accept this value.

Instructions must be in a language understandable by the person in charge to perform the water parameter test.