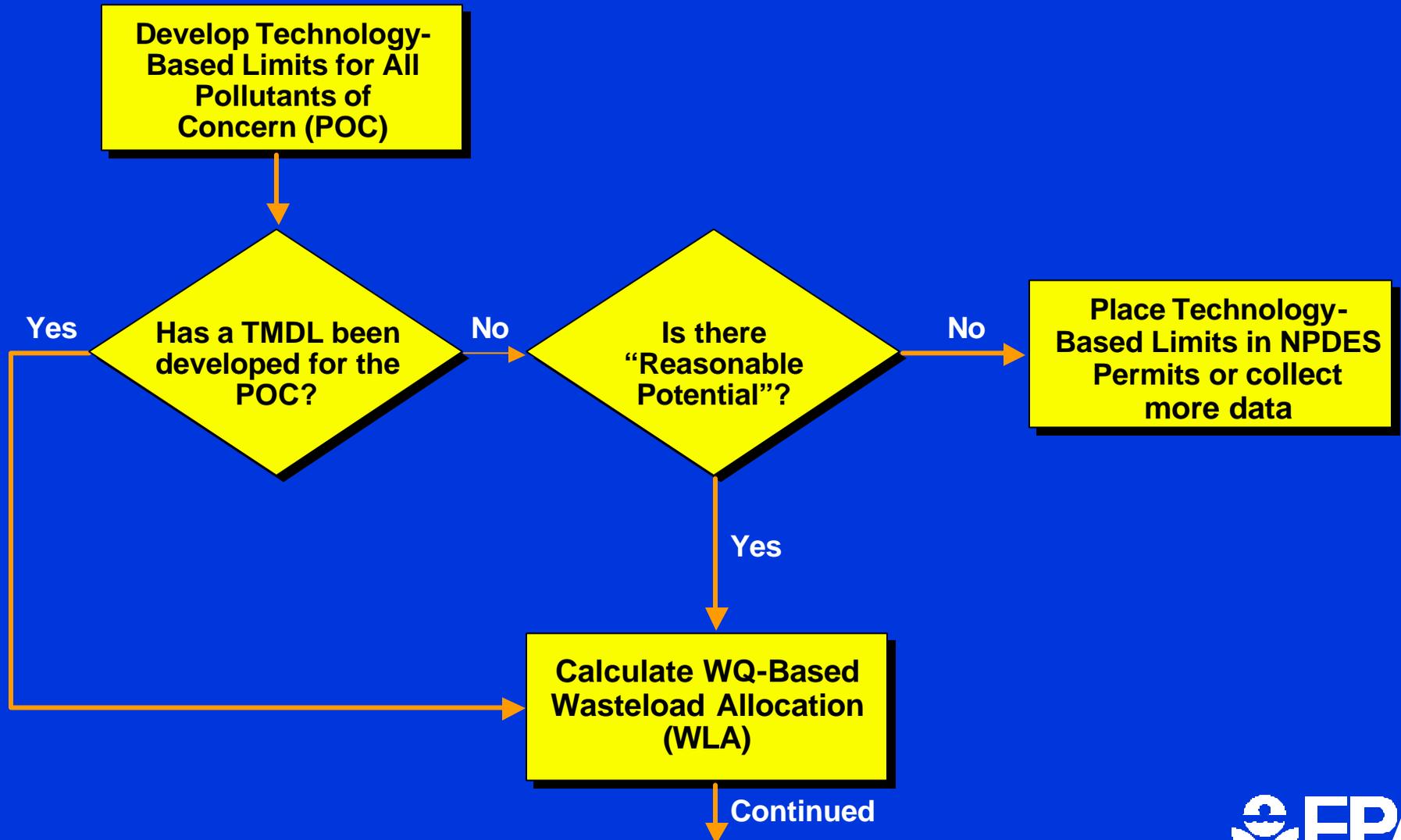

Standards to Permits Process

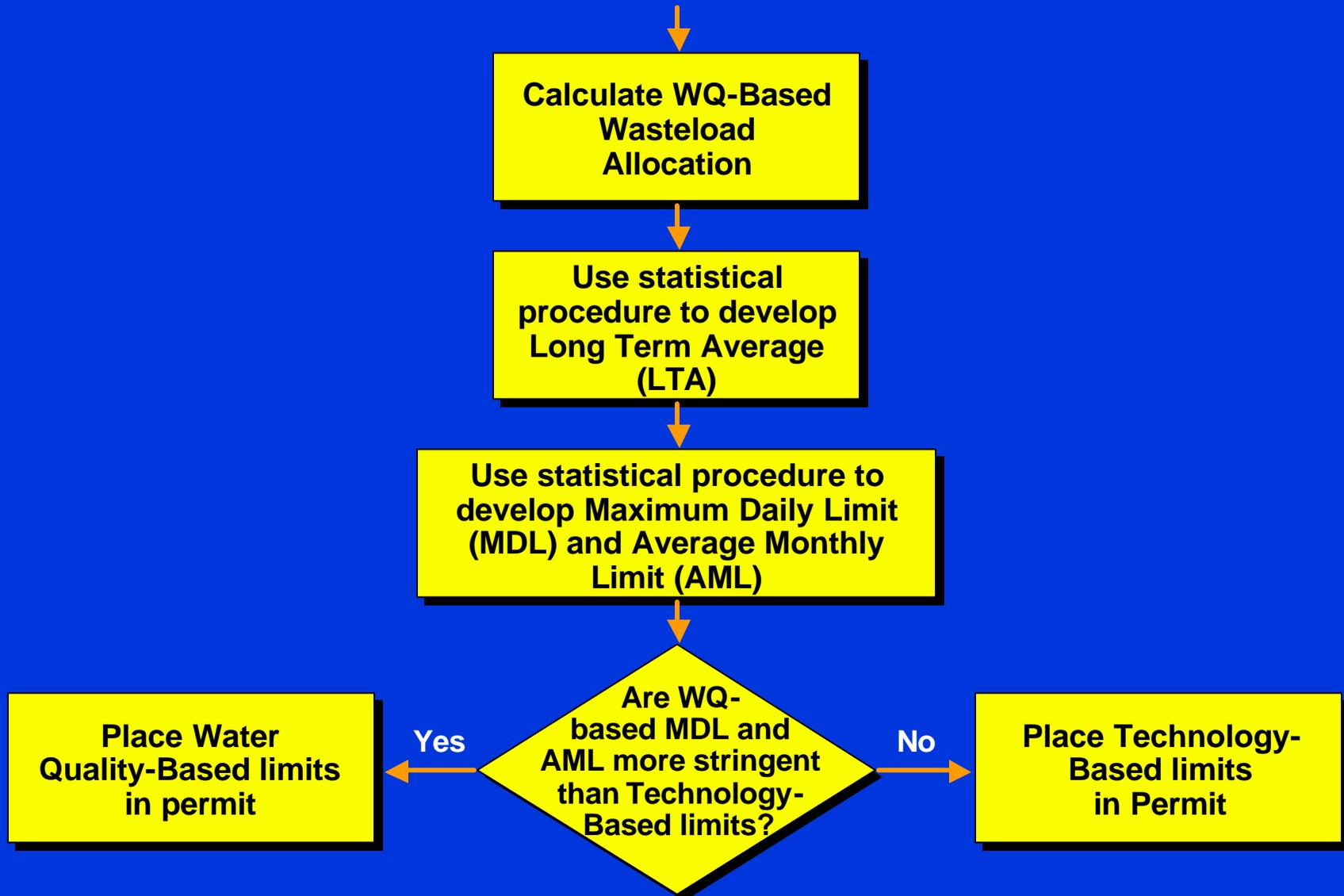
Learning Objectives

- ◆ **Introduce Total Maximum Daily Loads (TMDL)**
- ◆ **Explain concept of Wasteload Allocation (WLA)**
- ◆ **Summarize statistical approach to developing water quality-based effluent limitations**

Standards-to-Permits Process



Standards-to-Permits Process (Continued)



Total Maximum Daily Load (TMDL)

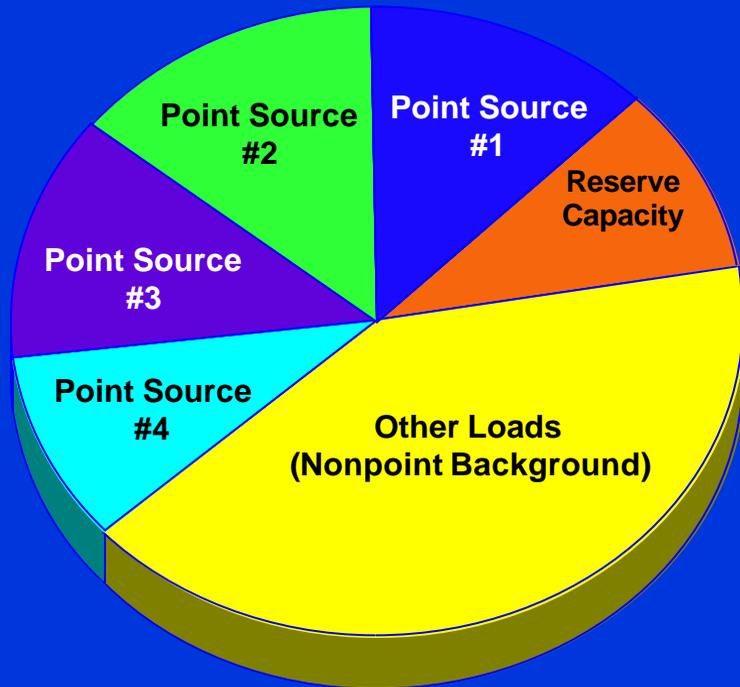
- ◆ **CWA Section 303(d)(1)**
 - Requires States to identify waters that will not achieve water quality standards after implementation of technology-based limits
 - States rank identified waters based on severity of pollution and uses
 - Requires TMDL for priority waters

Total Maximum Daily Load (TMDL)

(Continued)

- ◆ **Used as a tool for implementing water quality standards**
- ◆ **Defined as the amount of a pollutant that may be discharged into a waterbody and still meet water quality standard**

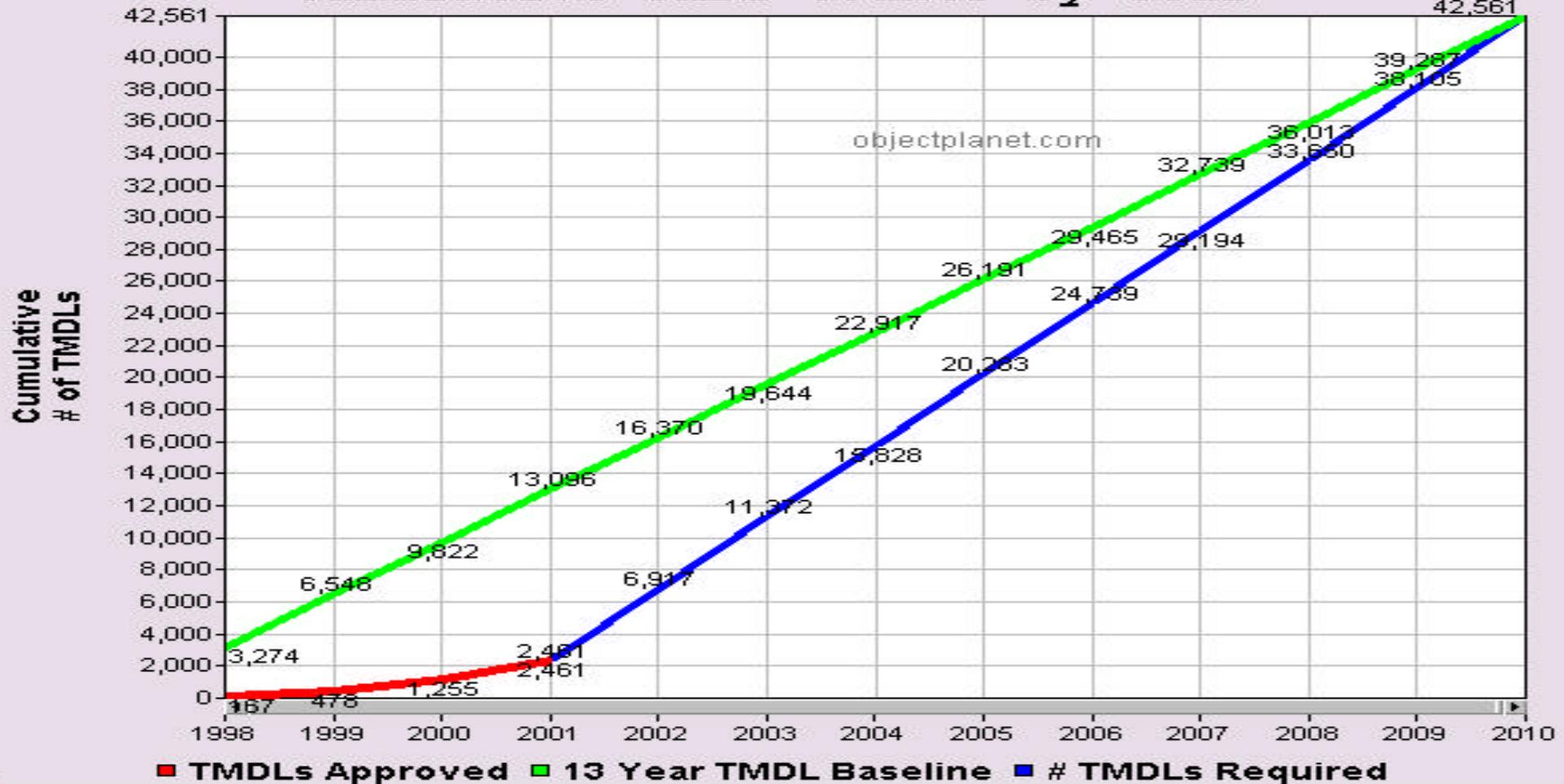
Components of TMDL



- ◆ Wasteload allocations (WLAs) are assigned to each point source discharge
- ◆ Load allocations (LAs) are assigned to nonpoint sources
- ◆ WLAs and LAs are established so that predicted receiving water concentrations do not exceed water quality criteria

TMDLs – The Challenge

Cumulative TMDL Counts by Year



Water Quality-based Effluent Limits

40 CFR §122.44(d)(1)(i)

- ◆ Limitations must be established in permits to control all pollutants or pollutant parameters that are or may be discharged at a level which will **cause**, have **reasonable potential to cause**, or **contribute** to an excursion above any state water quality standard.

Reasonable Potential Analysis

- ◆ **Technically defensible analysis to assess possible impact of discharge on the receiving water**
- ◆ **Possible impact on receiving water may be assessed with or without effluent data**

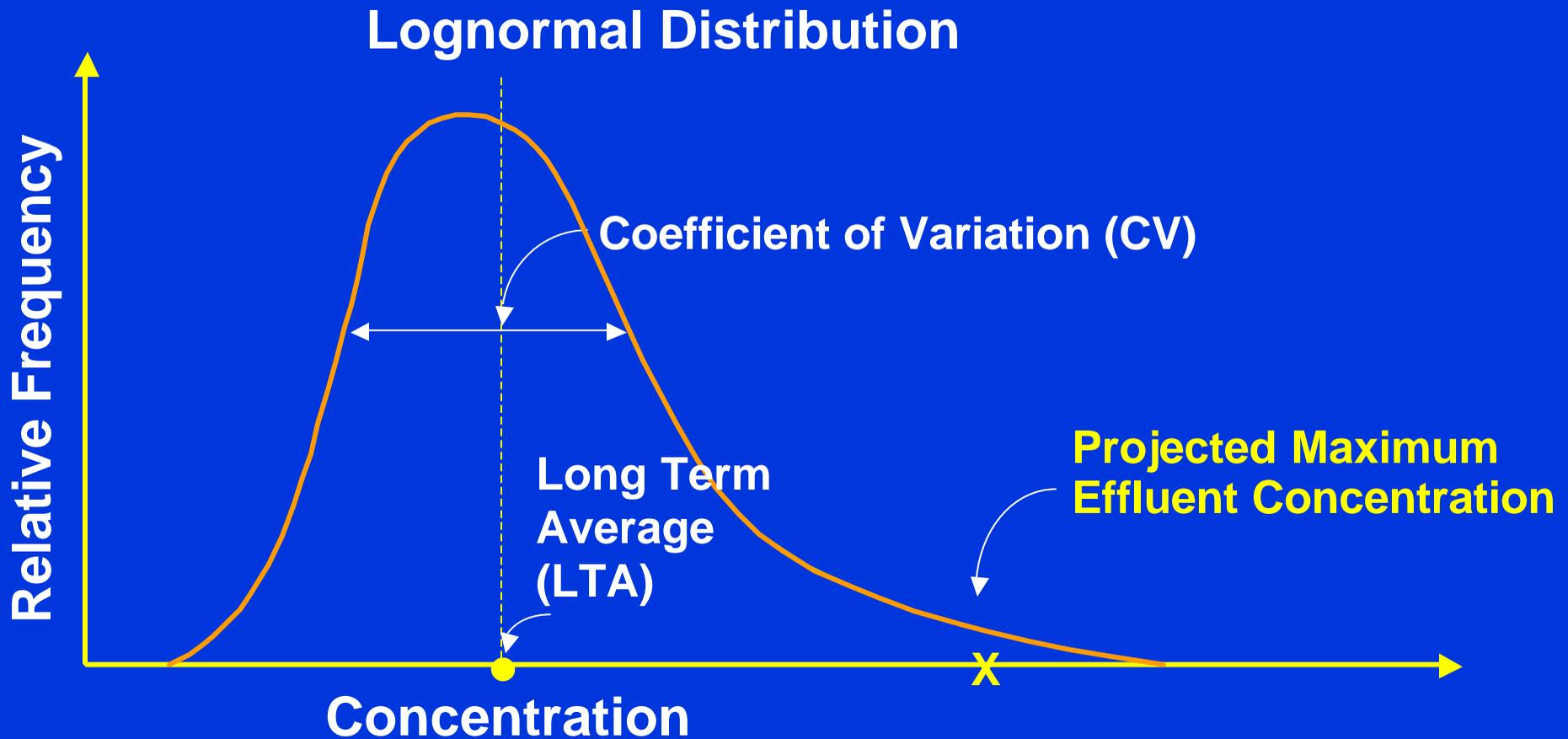
Reasonable Potential Analysis Without Effluent Data

- ◆ Type of industry or POTW
- ◆ History of toxic impacts
- ◆ Existing treatment technology
- ◆ Species Sensitivity
- ◆ Available dilution

Reasonable Potential Analysis with Effluent Data

- ◆ **Model the potential impact of the discharge on the receiving water under foreseeable “critical” conditions**
- ◆ **Must consider the “variability” of the pollutant in the effluent [40 CFR 122.44(d)(1)(ii)]**

Reasonable Potential Analysis with Effluent Data



Reasonable Potential Analysis with Effluent Data

Critical flow and background conditions



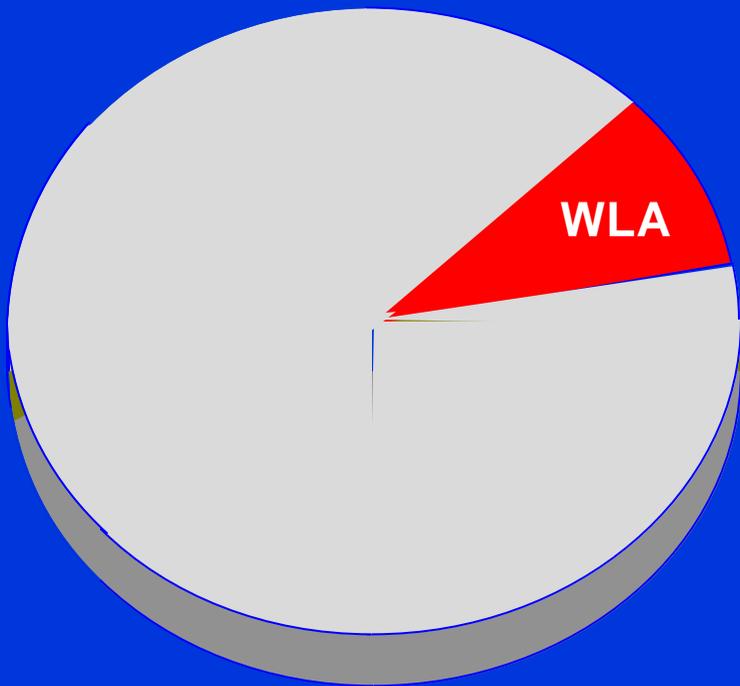
Reasonable Potential Analysis with Effluent Data

- ◆ If $Cr >$ State WQ criterion, then must establish a WQ-based limit.
- ◆ If $Cr \leq$ State WQ criterion, then no need to establish a WQ-based limit.

WQBEL is Needed

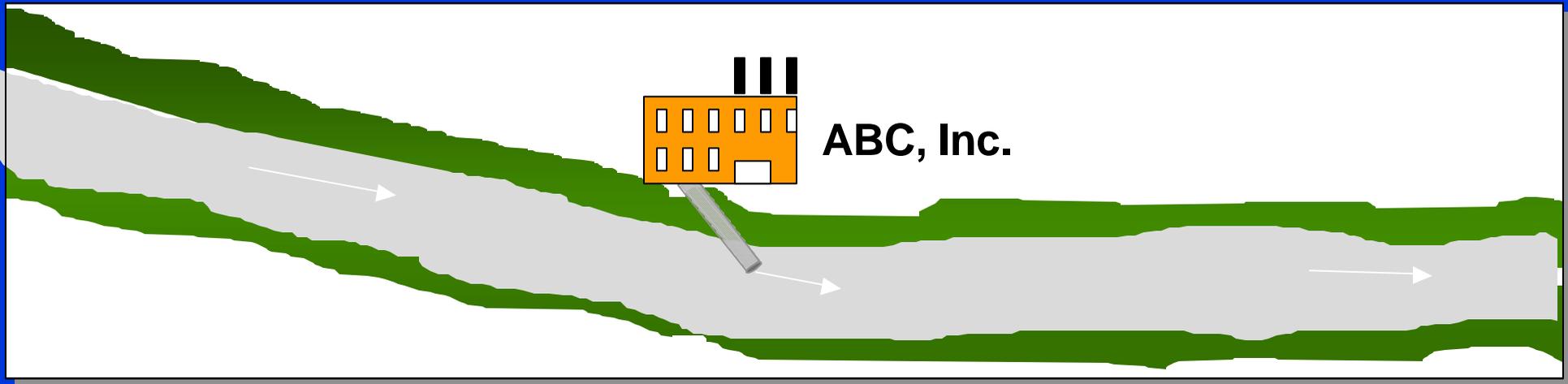
- ◆ If “reasonable potential” analysis determines a water quality-based effluent limit (WQBEL) is needed, how is it derived?
 - **Answer:** First develop a Wasteload Allocation (WLA), then use statistical procedures to derive maximum daily and average monthly limits

TMDL-Based Wasteload Allocation



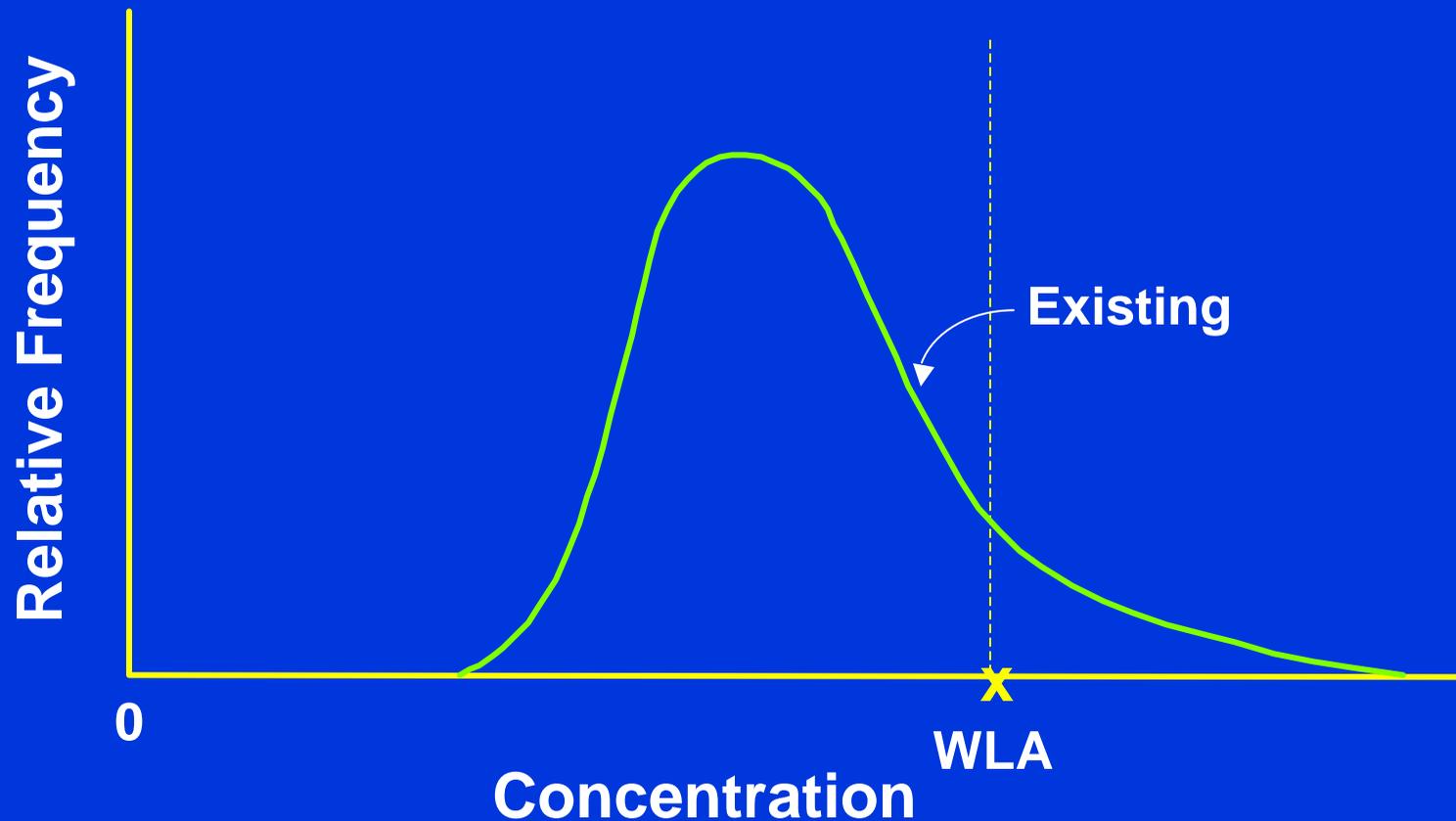
WLA = portion of the receiving water's total maximum daily load (TMDL) that is allocated to a specific point source

Facility-Specific Wasteload Allocation

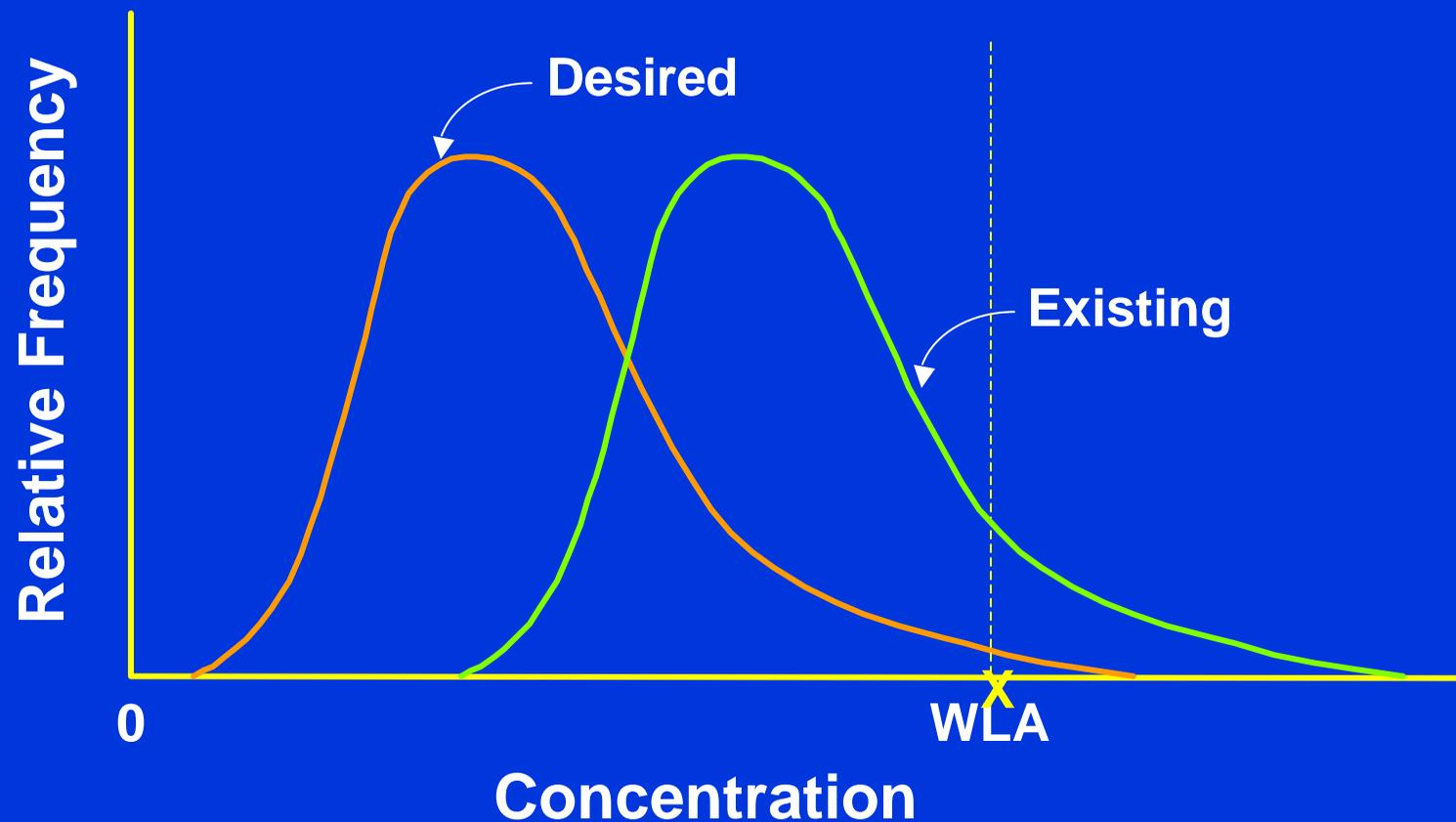


WLA = the maximum allowable pollutant concentration in the effluent from ABC, Inc. which, after accounting for available dilution, will meet water quality standards in-stream

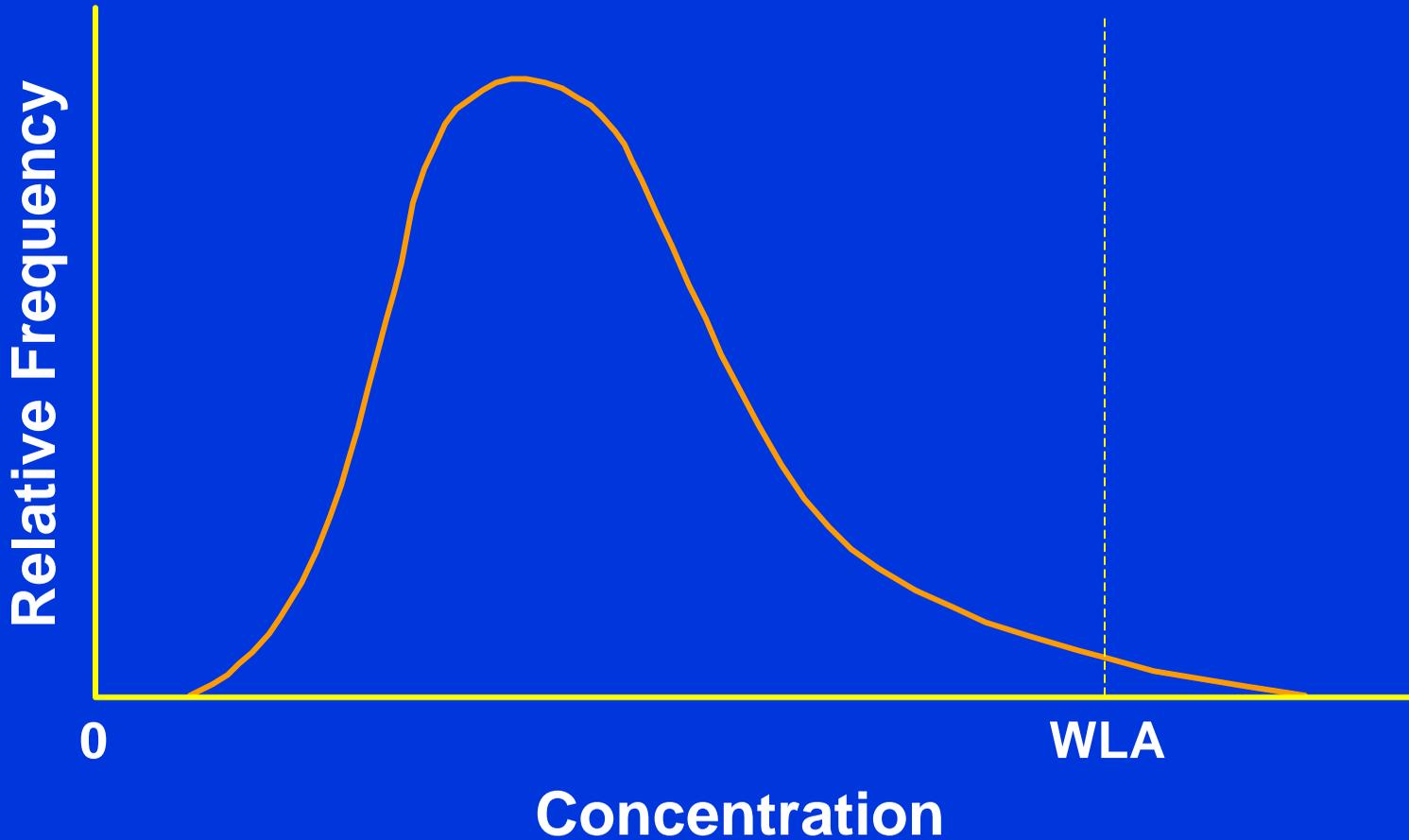
Goal is to Reduce Effluent Concentrations to Below the WLA



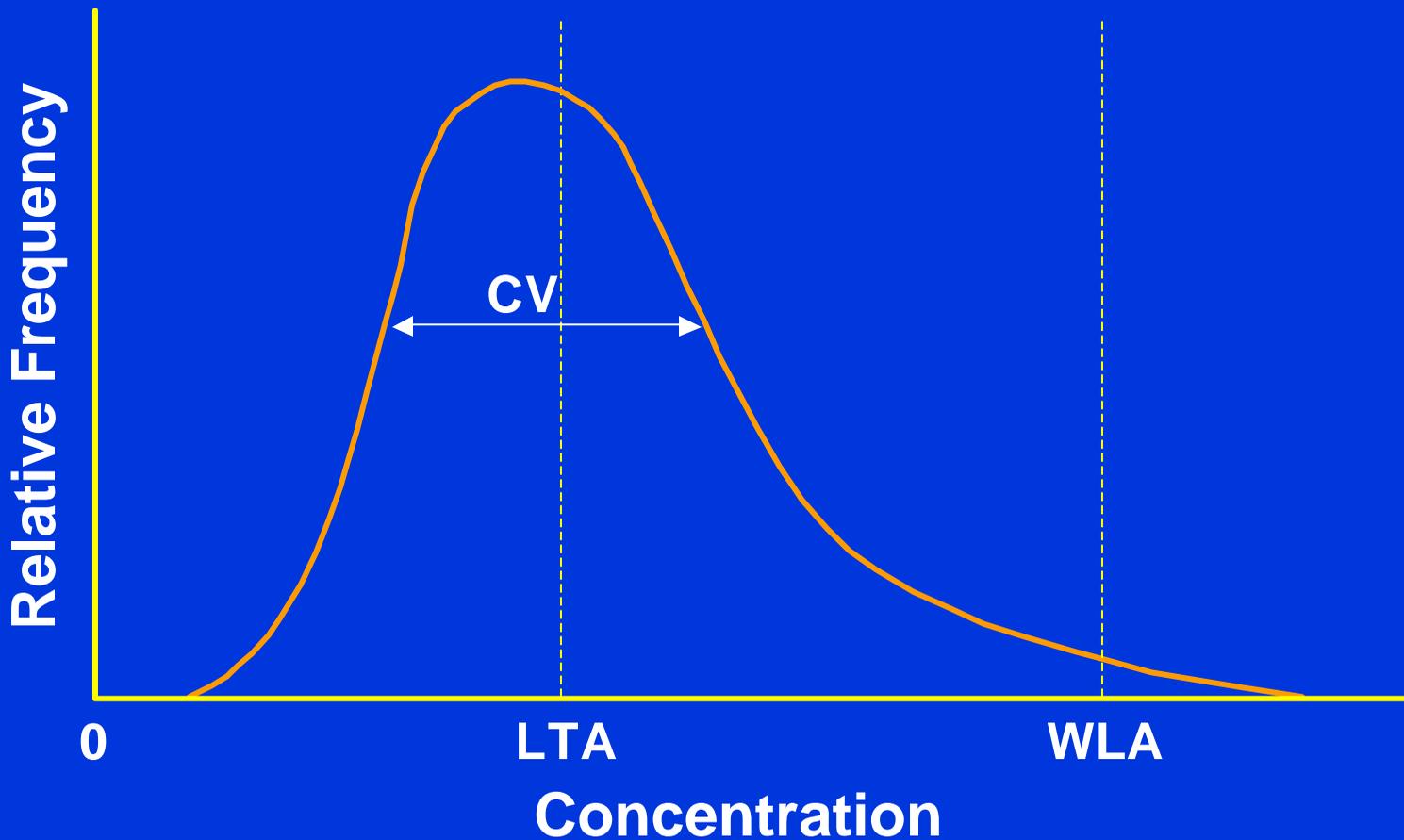
Goal is to Reduce Effluent Concentrations to Below the WLA



This Distribution Achieves the Goal



We Can Characterize the Desired Distribution by LTA and CV



We Can Determine the Effluent Limits Based Upon the Distribution

