
Overview of the National Pollutant Discharge Elimination System (NPDES) Program

Clean Water Act

- Sec. 301 - Effluent Standards
- Sec. 302 - Water Quality Related Effluent Limitations
- Sec. 303 - Water Quality Standards and Implementation Plans
- Sec. 304 - Criteria and Effluent Guidelines
- Sec. 307 - Toxic and Pretreatment Effluent Standards
- Sec. 308 - Inspections, Entry, Monitoring, and Information
- Sec. 309 - Federal Enforcement
- ***Sec. 402 - National Pollutant Discharge Elimination System permits based on technology and water quality***
- Sec. 403 Ocean Discharge Criteria
- Section 404: Permits for discharge of dredged/fill material
- Sec. 405 - Disposal of Sewage Sludge (Biosolids)
- Sec. 502 - General Definitions
- Sec. 510 - State Authority
- Sec. 518 - Indian Tribes

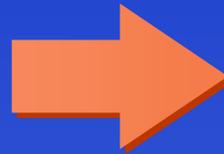
What is a Permit?



- It is a license granting permission to do something which would be illegal otherwise
- There is no right to a permit and it is revocable for cause (noncompliance)
- NPDES permit is license to discharge

NPDES Statutory Framework

- All “point” sources
- “Discharging pollutants”
- Into “waters of the U.S.”

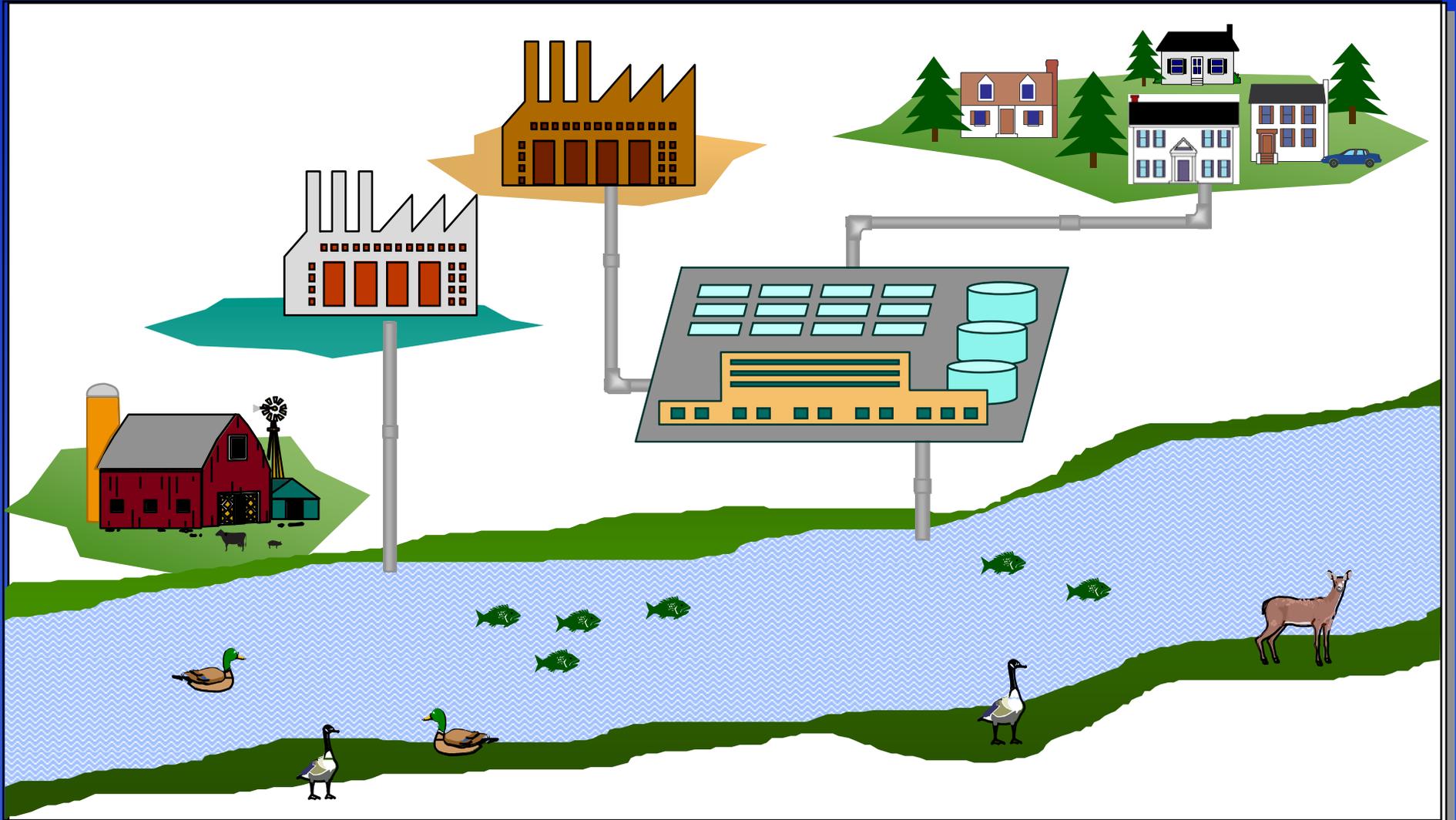


Must obtain an NPDES permit from EPA or an authorized State

Point Source - 40 CFR 122.2

- **Any discernible, confined, and discrete conveyance, including but not limited to:**
 - Any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged.
 - Does not include return flows from irrigated agriculture or agricultural storm water runoff

What is a Point Source?



Pollutant – 40 CFR 122.2

- **Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.**
 - **Does not include sewage from vessels or injected wastes**

CWA Classes of Pollutants

- **Conventional pollutants**
 - BOD, TSS, Oil and Grease, Fecal Coliform bacteria, and pH
- **Toxic pollutants**
 - 126 “Priority Pollutants”
 - Heavy metals (e.g., Cu, Pb, Hg)
 - Organics compounds (e.g., PCBs, dioxin)
- **Non-Conventional**
 - Everything else....
 - e.g., Chlorine, ammonia, nitrogen, phosphorus

Waters of the U.S. - 40 CFR §122.2

Examples:

- Rivers and streams
- Lakes and ponds
- Wetlands
- Sloughs
- Prairie potholes
- Intermittent streams
- Territorial seas
- Etc.



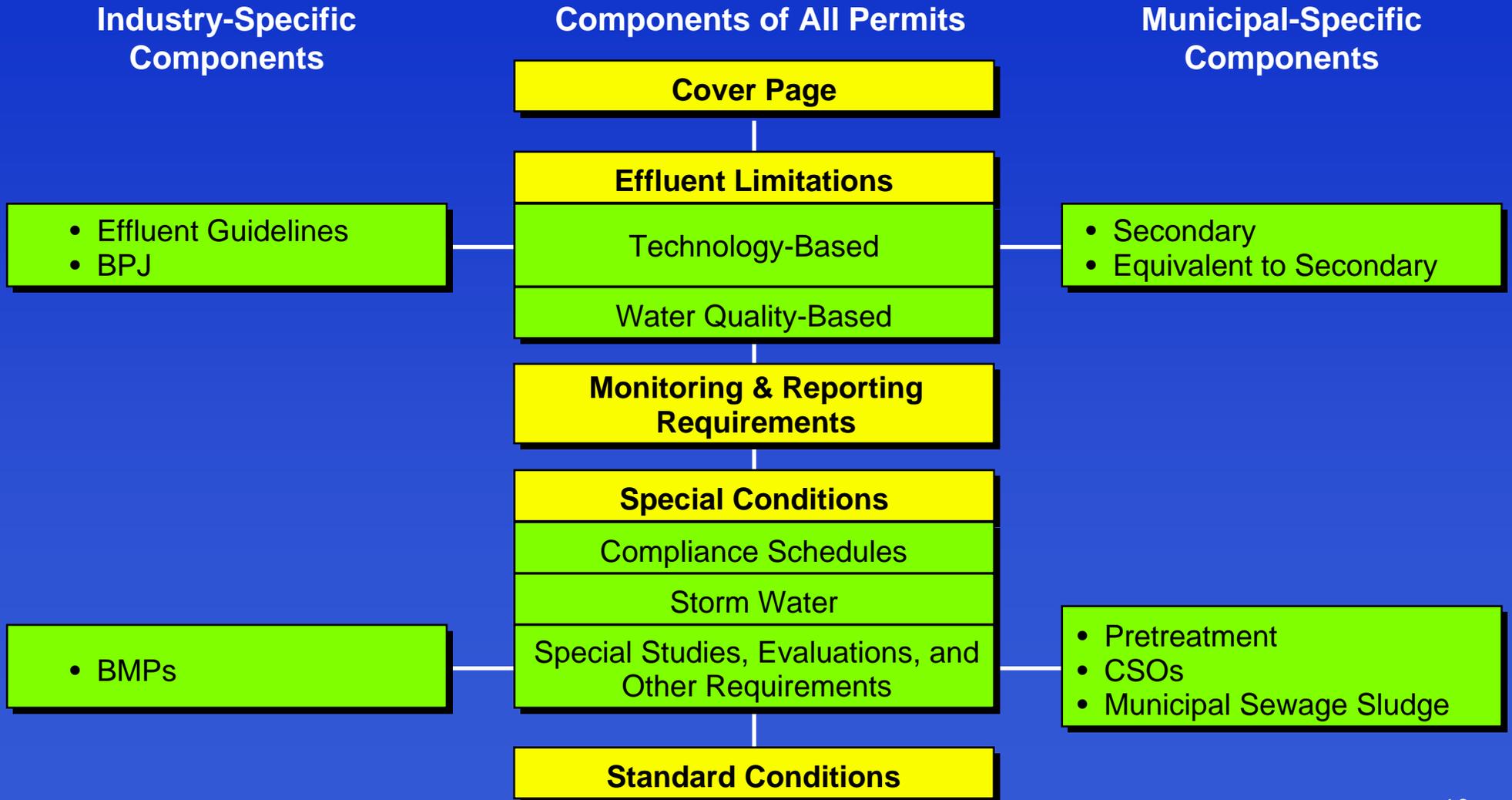
Types of NPDES Permits – Individual

- **Individual Permit**
 - 1 application submitted → 1 permit issued
 - Appropriate where site-specific limits, management practices, monitoring and reporting, or other facility-specific permit conditions are needed

Types of NPDES Permits - General

- **General Permit (40 CFR 122.28)**
 - 1 permit issued → many applications submitted
 - Appropriate where multiple dischargers require permit coverage, sources and discharges are similar, permit conditions are relatively uniform
 - Permit must identify:
 - Area of coverage
 - Sources covered
 - Application process (Notice of Intent)

Permit Components



NPDES Implementation

- **Before State/Tribal program approval:**
 - EPA issues permits
 - EPA conducts compliance and monitoring activities
 - EPA enforces
- **After State/Tribal program approval:**
 - States implement as above
 - EPA role = oversight
 - Grants
 - Administrative, technical and legal support and training
 - Enforcement as necessary

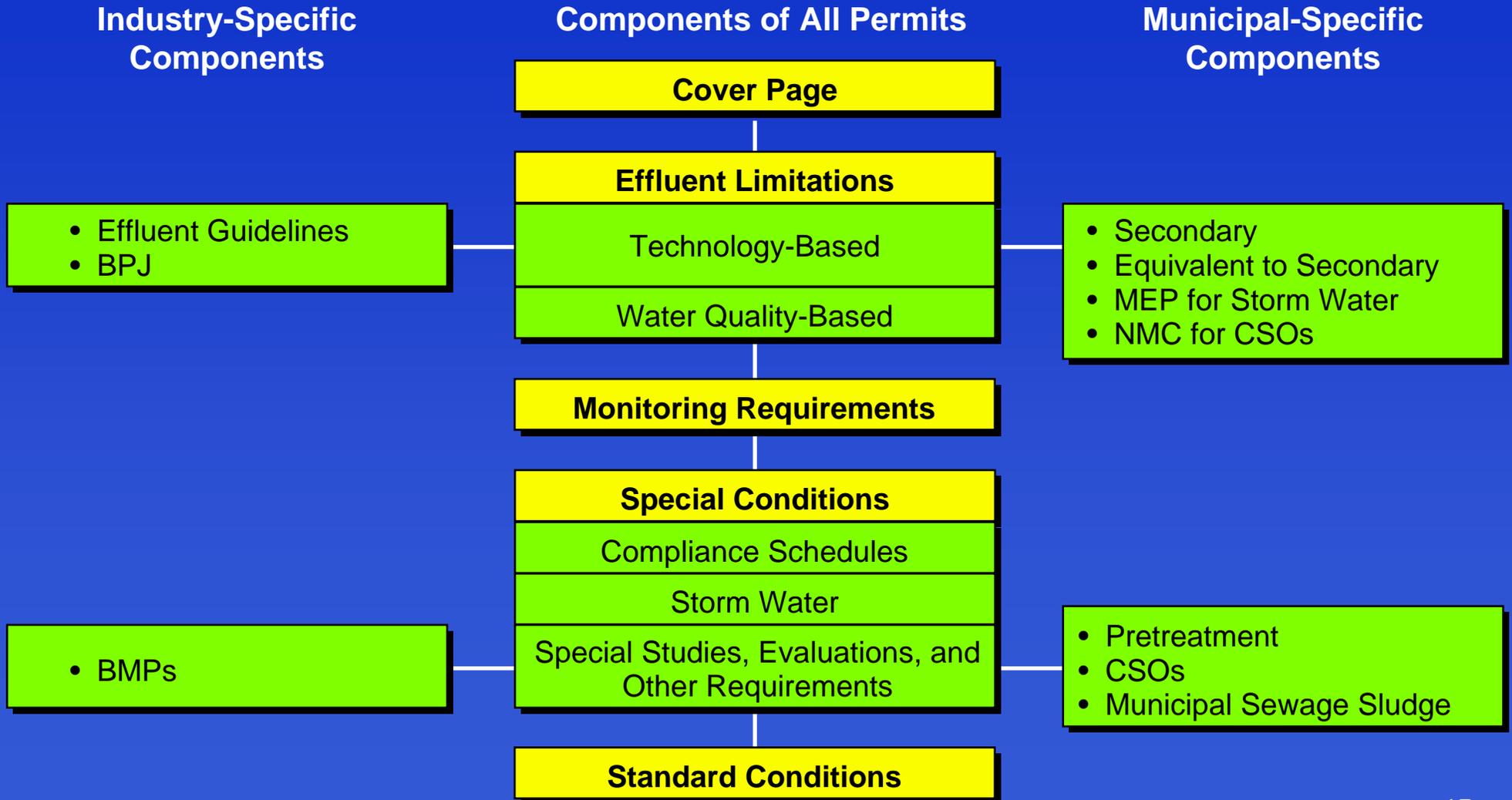
Overview of the Current and Projected NPDES Universe (Estimates as of 09/30/2007)

Type of Facility		Approximate No. of Facilities
Major	<ul style="list-style-type: none"> • Individual Permits • POTWs • Non-POTWs or Non-municipals 	6,700 (4,200) (2,500)
Minor	<ul style="list-style-type: none"> • Individual Permits—site specific requirements • POTWs • Non-POTWs or Non-municipals 	39,000 (10,000) (29,000)
Minor	<ul style="list-style-type: none"> • Covered by General Permits • Non-Stormwater • POTWs and Industrial Facilities 	67,000

Overview of the Current and Projected NPDES Universe (continued)

Type of Facility	Approximate Number of Facilities
Stormwater: Phase I MS4s	1,000
Stormwater: Phase II MS4s	6,000
Stormwater: Phase I Industrial	96,500
Stormwater: Phase II Industrial	36,000
Stormwater: Phase I Construction	158,500 per year
Stormwater: Phase II Construction	91,500 per year

Permit Components



Technology- and Water Quality- Based Effluent Limits

Basis:	Technology	Water Quality
Goal:	“Zero Discharge of Pollutants”	“Fishable/Swimmable”
Reg. Cite:	40 CFR 122.44(a)&(e) 40 CFR 125.3	40 CFR 122.44(d)
Relationship:	Technology-based effluent limits are developed for all applicable pollutants of concern. If these limits are not adequate to protect water quality, then water quality-based effluent limits must be developed.	



Technology-Based Requirements

- **Purpose**

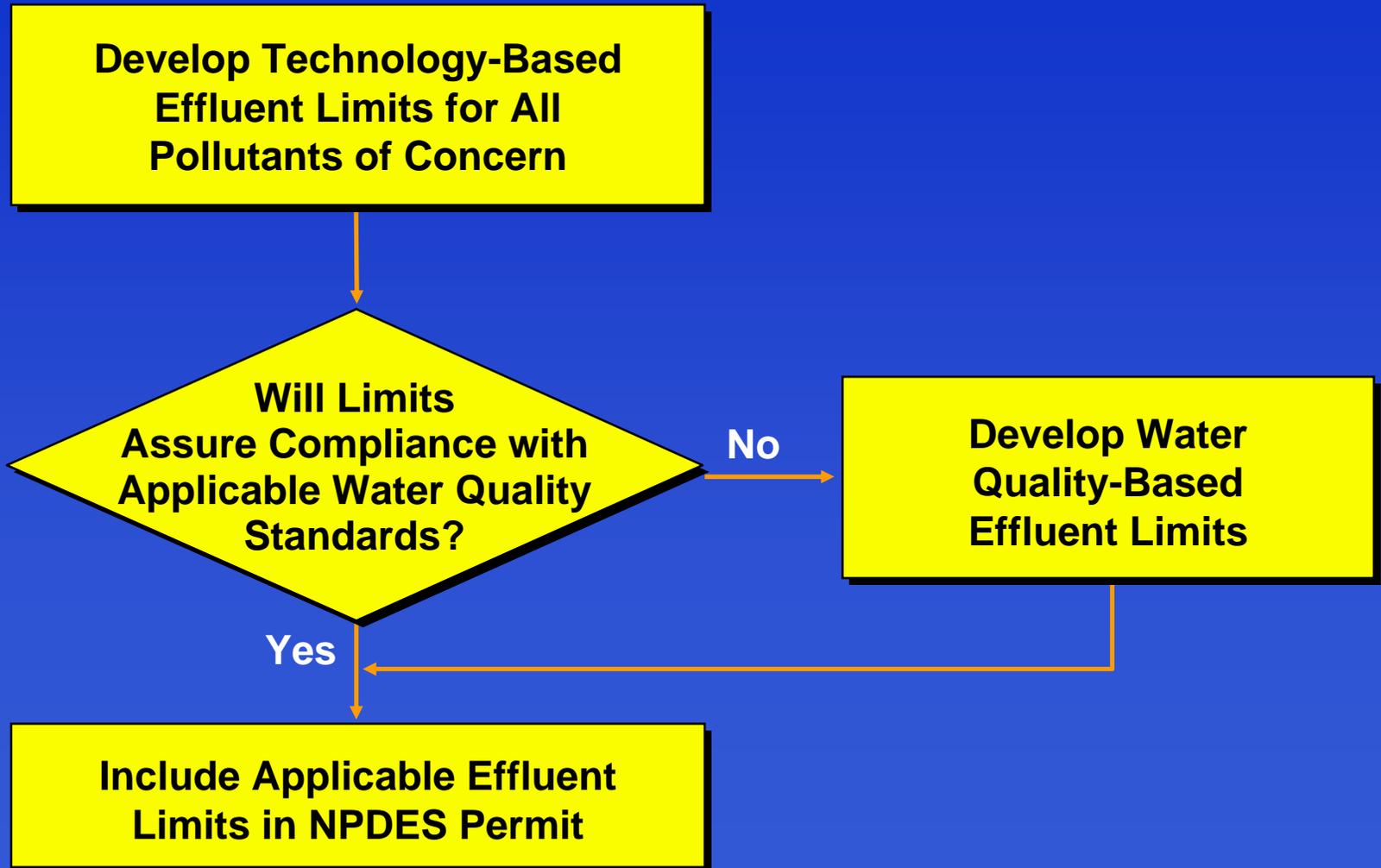
- Establish minimum level of pollutant controls for all point source dischargers
 - Conventional pollutants
 - Non-conventional pollutants
 - Toxic pollutants
- Provide equity among dischargers within categories



Technology-Based Requirements

- **Technology-based requirements implemented through NPDES permits**
- **National technology-based standards are available**
 - Effluent guidelines for non-municipal
 - Secondary treatment standards for municipal
- **In the absence of National standards**
 - Technology-based requirements developed on a case-by-case basis

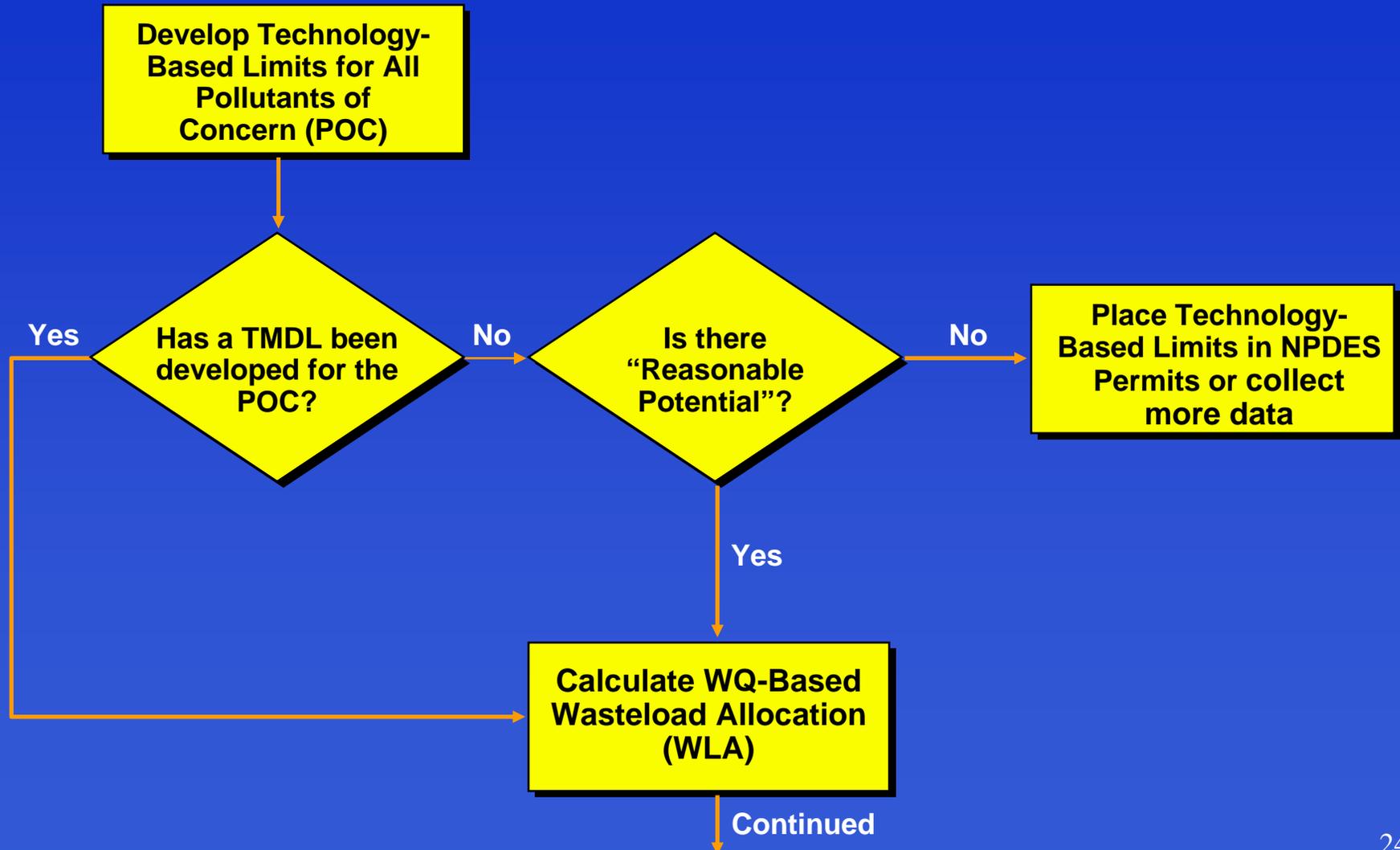
Developing Effluent Limitations



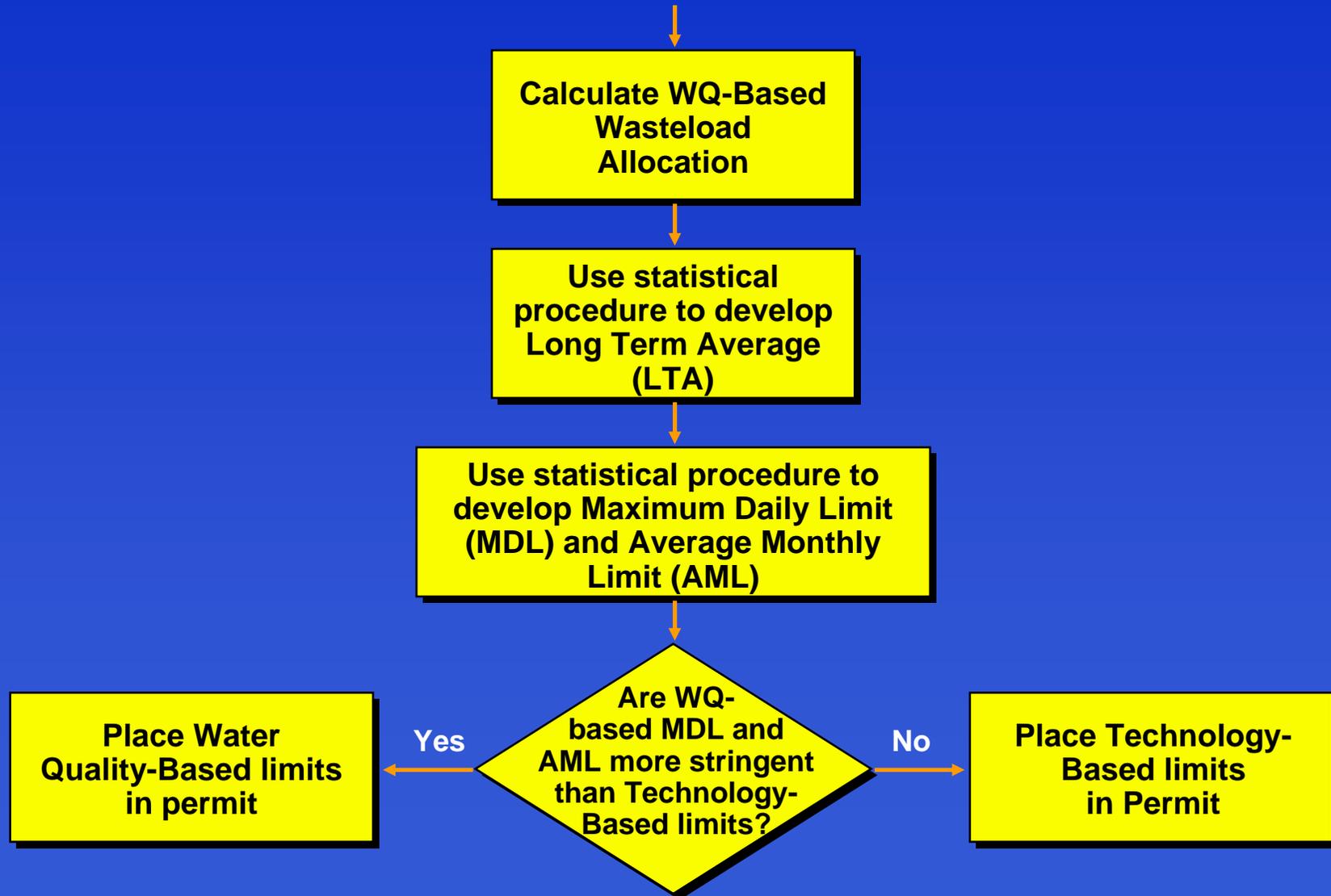
Standards-to-Permits Process

- 40 CFR §122.44(d)
- *Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001), March 1991*

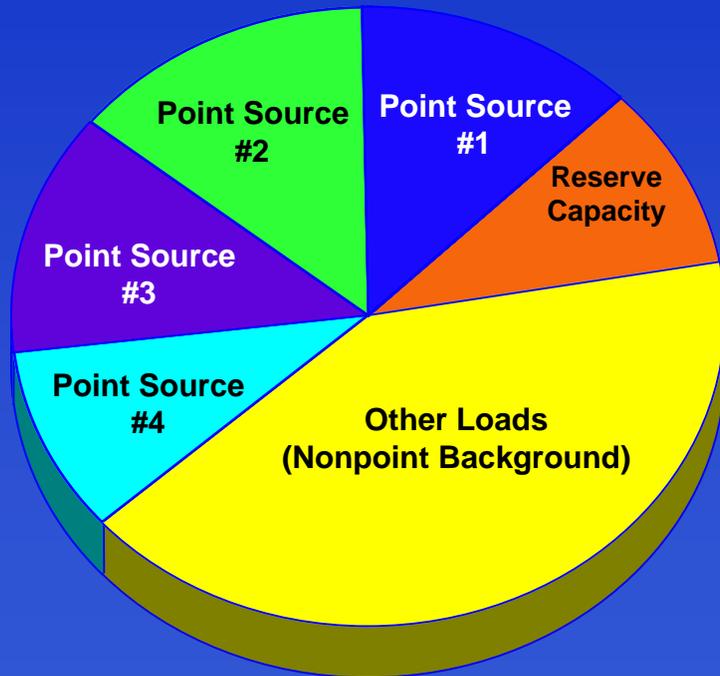
Standards-to-Permits Process



Standards-to-Permits Process (Continued)



Components of TMDL



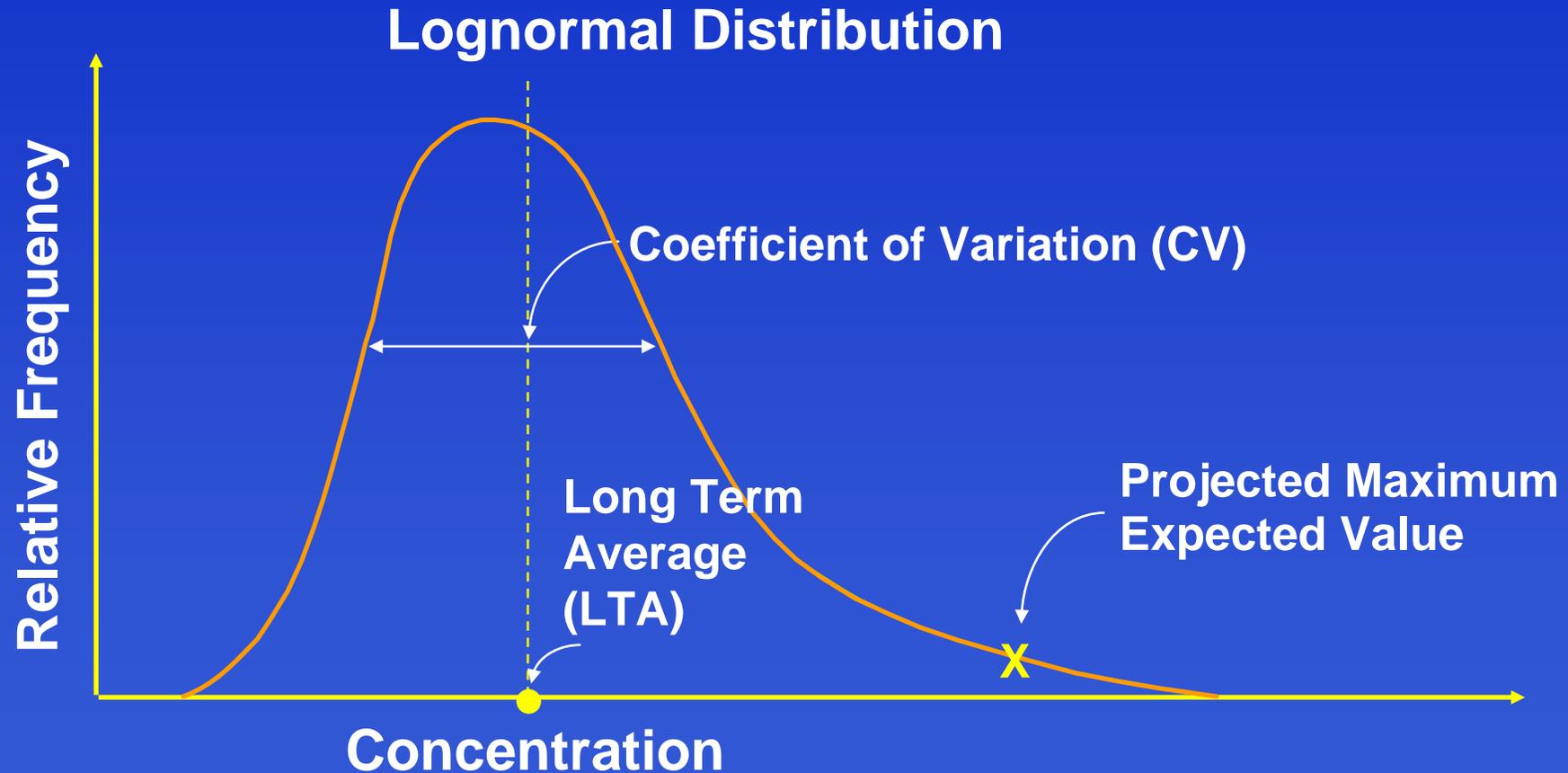
- Wasteload allocations (WLAs) are assigned to each point source discharge
- Load allocations (LAs) are assigned to nonpoint sources
- WLAs and LAs are established so that predicted receiving water concentrations do not exceed water quality criteria

Reasonable Potential

40 CFR §122.44(d)(1)(i)

- Limitations must 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 with Effluent Data



Reasonable Potential Analysis



Is Dilution Allowed?

- **Clean Water Act does not require attaining water quality criteria at the point of discharge**
- **States have discretion to allow dilution**
- **States should specify any conditions on dilution allowances as part of their water quality standards**
- **122.44(d)(2) states that when establishing WQBELs “should account for dilution of the effluent in the receiving water (where appropriate)”**

Is Dilution Allowed?

Do water quality standards allow consideration of dilution?

No



Criteria apply at end of pipe

Yes



Determine level of dilution allowed by water quality standards



Continue to next step

Mixing Considerations

↓
Is there rapid and complete mixing?

Yes ↙

↘ No

Complete mix assessment

Incomplete mix assessment
(mixing zone)

↓
Are resources available
for dynamic modeling and is
a dynamic model desirable?

No ↙

↘ Yes

Steady state
model

Dynamic model

Determining the Need for a Limit

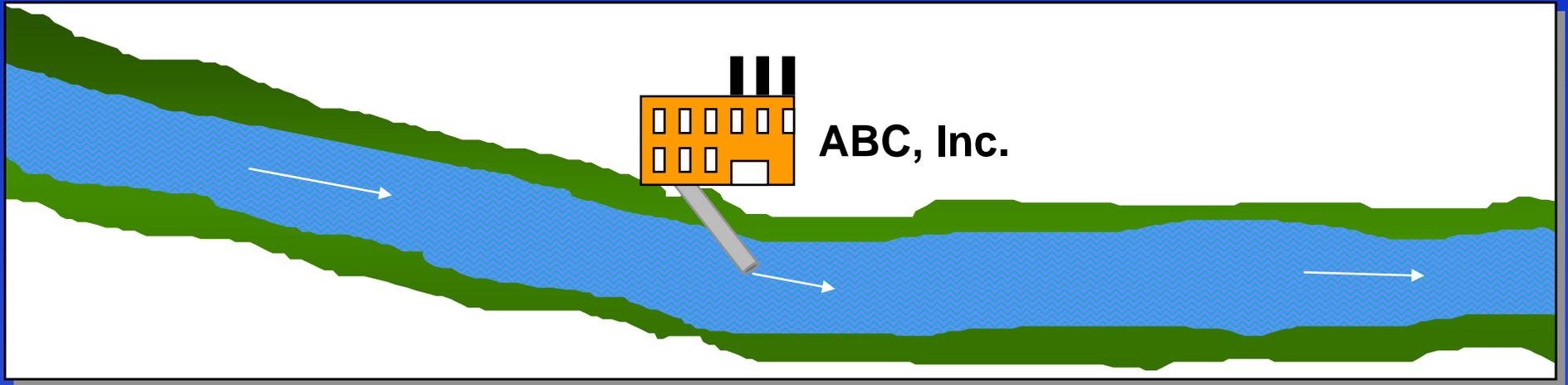
- If projected receiving water concentration $>$ State WQ criterion, then need to establish a WQ-based limit.
- If projected receiving water concentration \leq State WQ criterion, then no need to establish a WQ-based limit.

TMDL-Based Wasteload Allocation



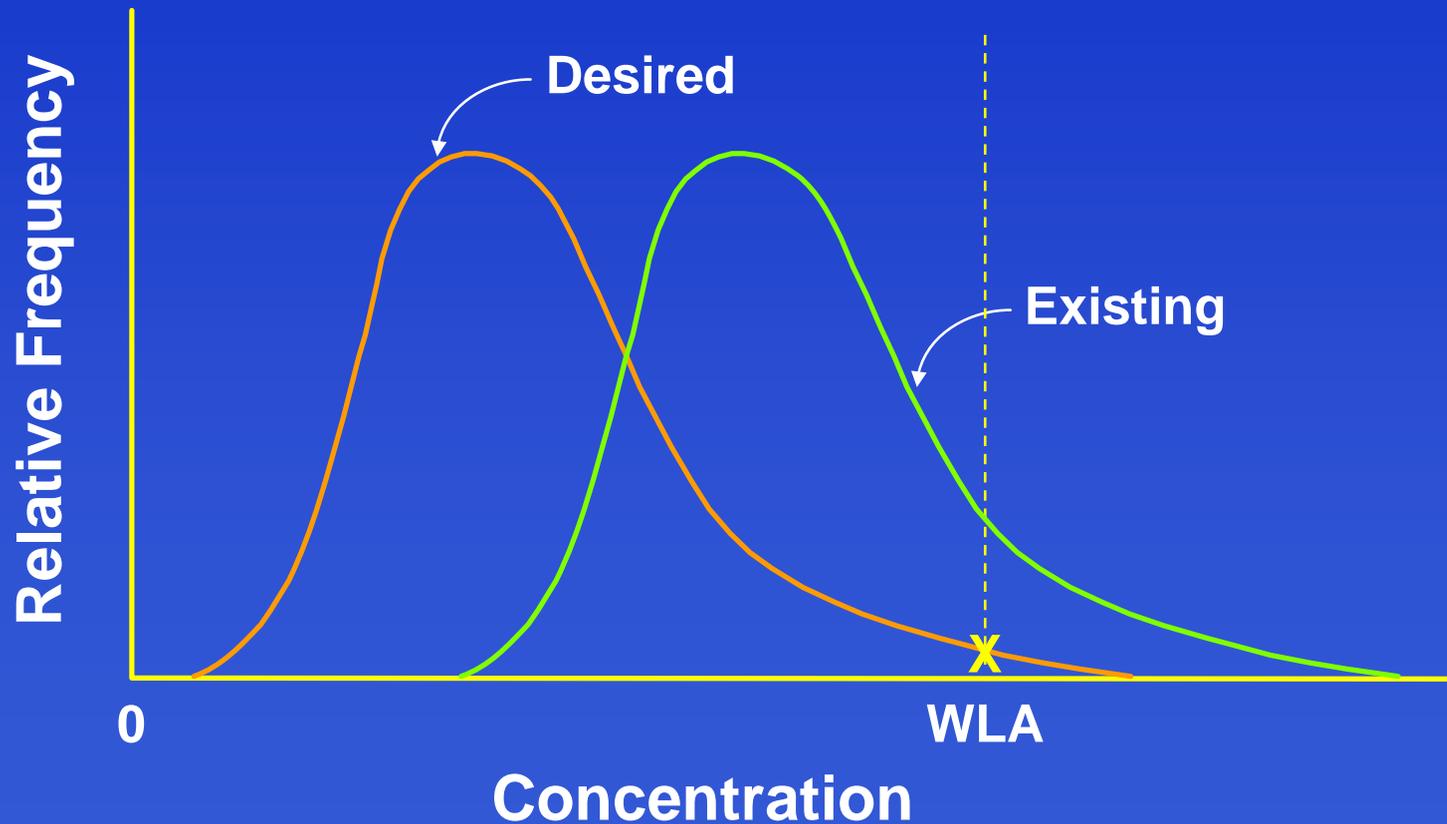
WLA = portion of the receiving water's total maximum daily load (TMDL) that is allocated to a specific point source

Facility-Specific Wasteload Allocation

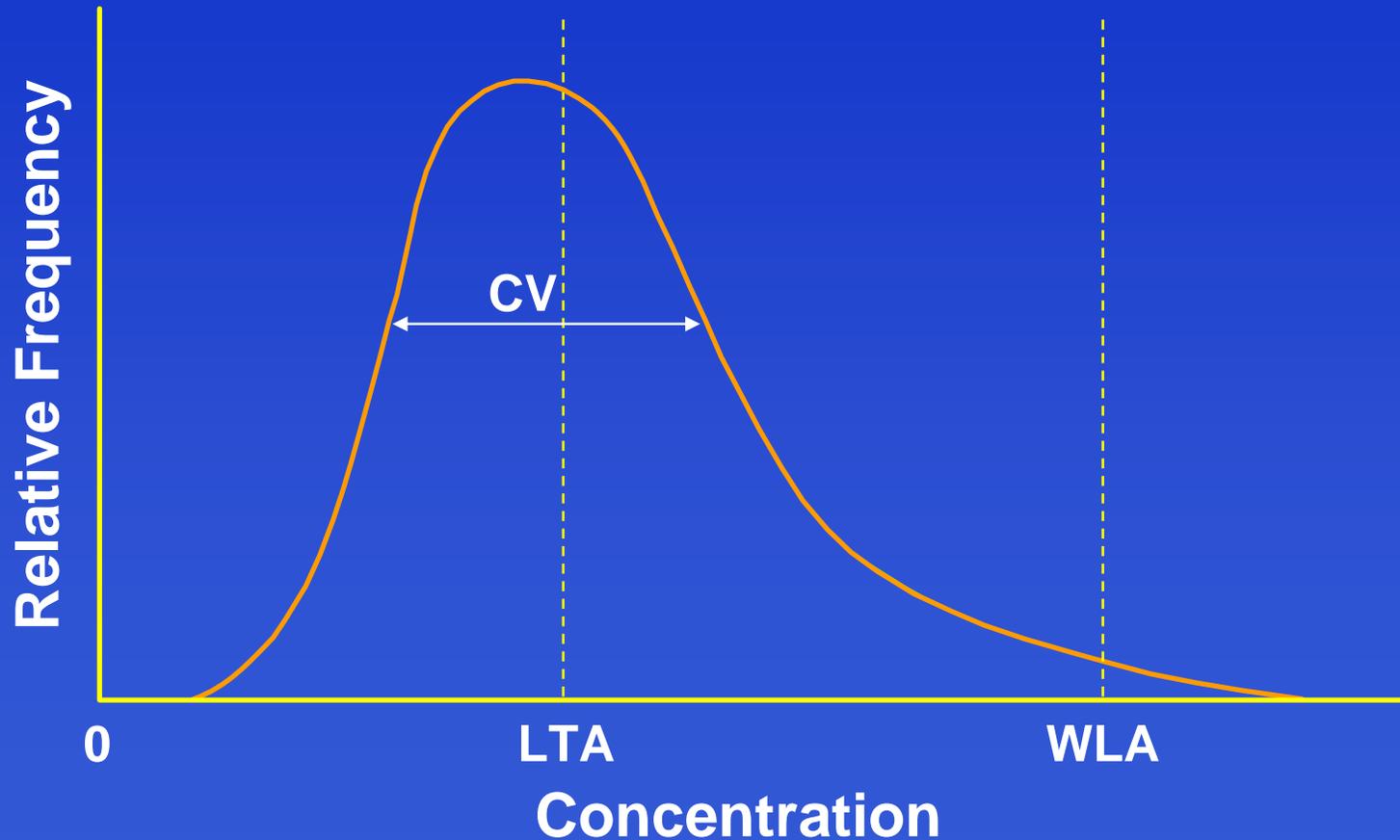


WLA = the maximum allowable pollutant concentration in the effluent from ABC, Inc. which, after accounting for available dilution, will meet water quality standards in-stream

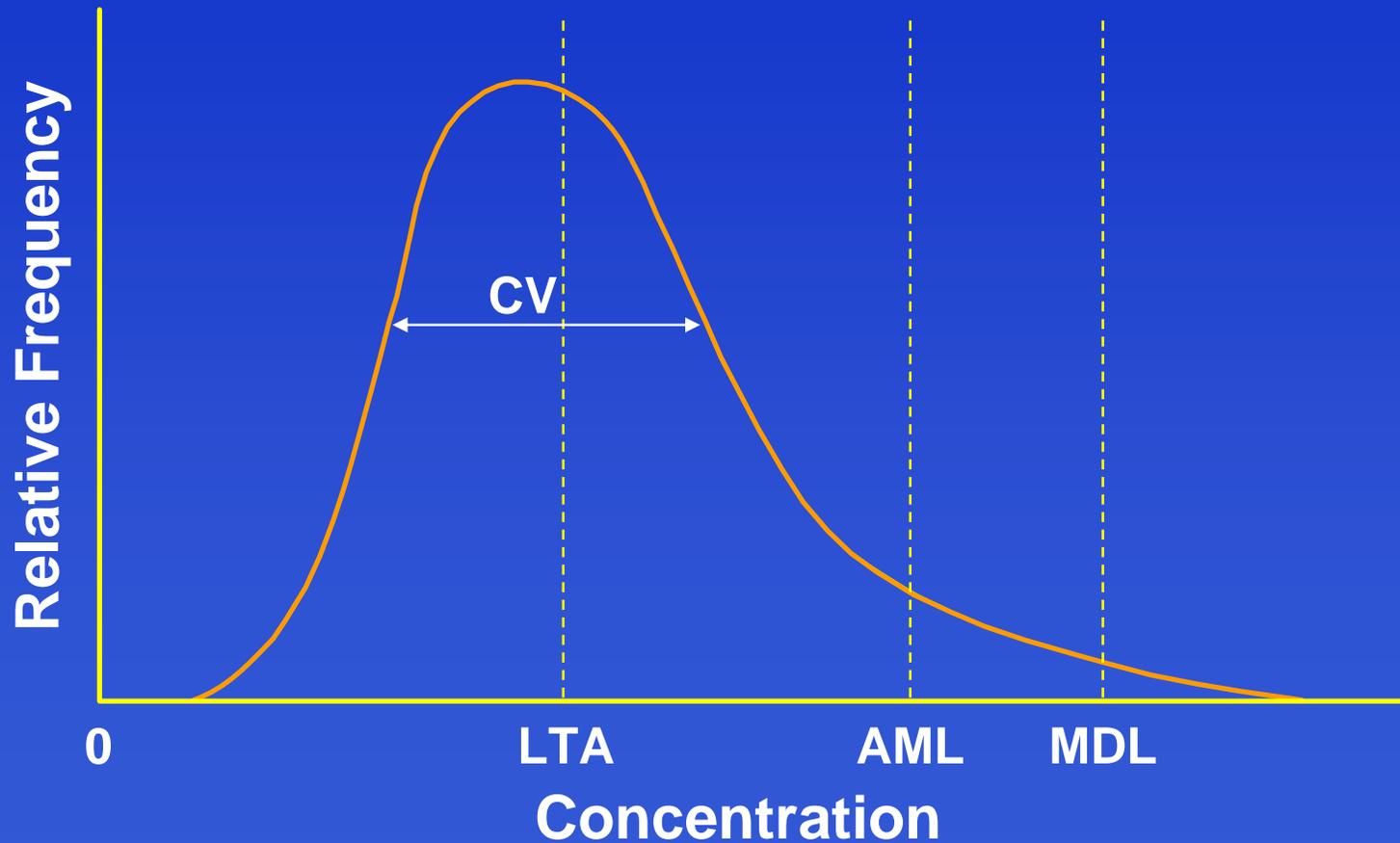
Goal is to Reduce Effluent Concentrations to Below the WLA



We Can Characterize the Desired Distribution by LTA and CV



We Can Determine the Effluent Limits Based Upon the Distribution



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