




MTD EVALUATION PROGRAMS: NJDEP & TAPE

PROPRIETARY FILTRATION DEVICES MEETING

10/10/2018

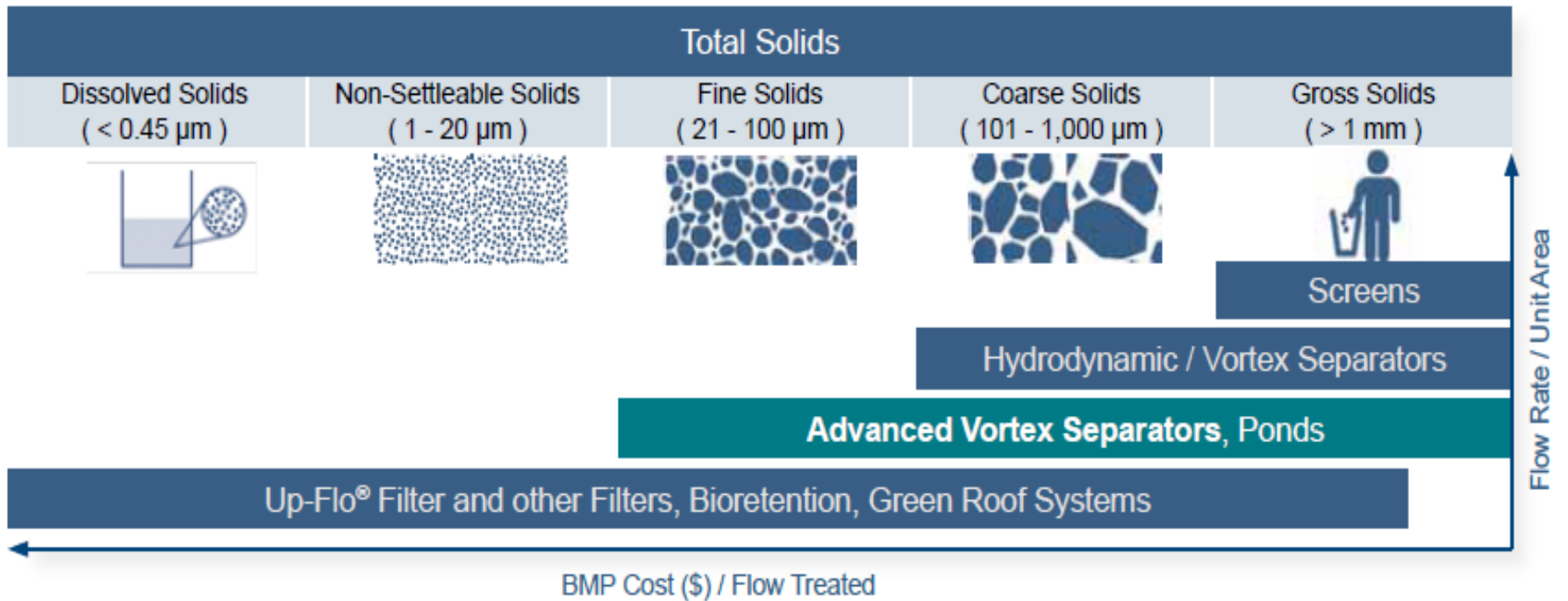


BENEFITS OF PERFORMANCE PROTOCOL

- Allows new technology development
- Verifies vendor's performance claims
- Creates path to equivalency
- Create efficiencies
 - Design Engineers
 - Manufacturers
 - Plan Review
- Meets local water quality standards



TSS CONTROL LIMITS



NJDEP vs TAPE

	NJDEP	TAPE
Lab or Field Based	Lab	Field (except pretreatment)
Pollutants of Concern	TSS	TSS, Phosphorous, Metals, Oil
Levels of Certification	One	Three (PULD, CULD, GULD)
Cost Considerations	\$ - lab testing & observation \$20,000 - NJCAT verification	\$ - field testing (\$250,000+) \$12,000 - program fees

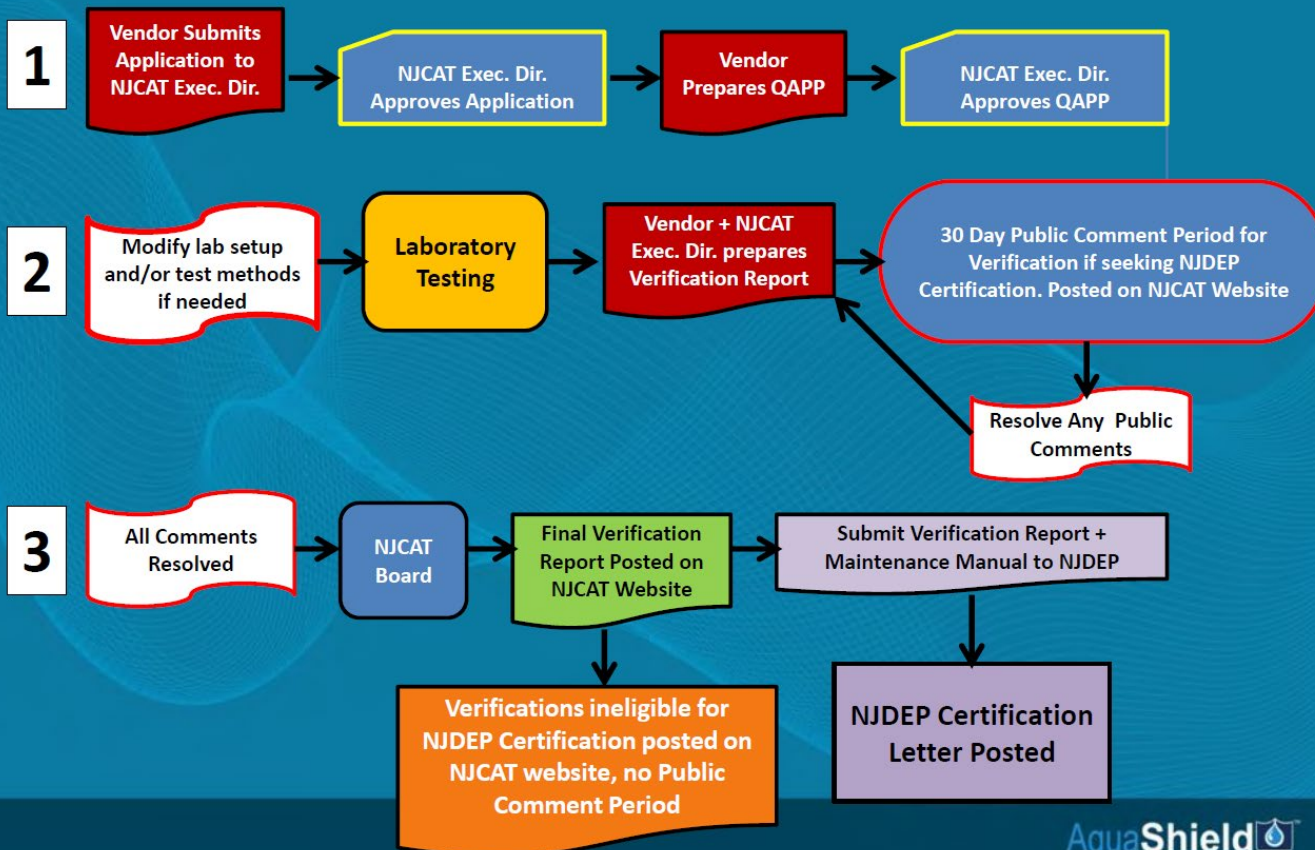


NJDEP CERTIFICATION PROGRAM



NJDEP PROCESS

NJCAT Verification + NJDEP Certification Process



NJDEP CERTIFICATION PROCESS

■ NJCAT Verification

- Verifies manufacturer's performance claims
- Some technologies are NJCAT verified without NJDEP certification

■ NJDEP Certification

- NJDEP is the regulatory agency that establishes protocol and houses policy
- Certification must be obtained to prove conformance with policy

NJDEP CERTIFICATION REQUIREMENTS

- Filters
 - 80% TSS
 - Flow, exhaustion, and area limits used to calculate size

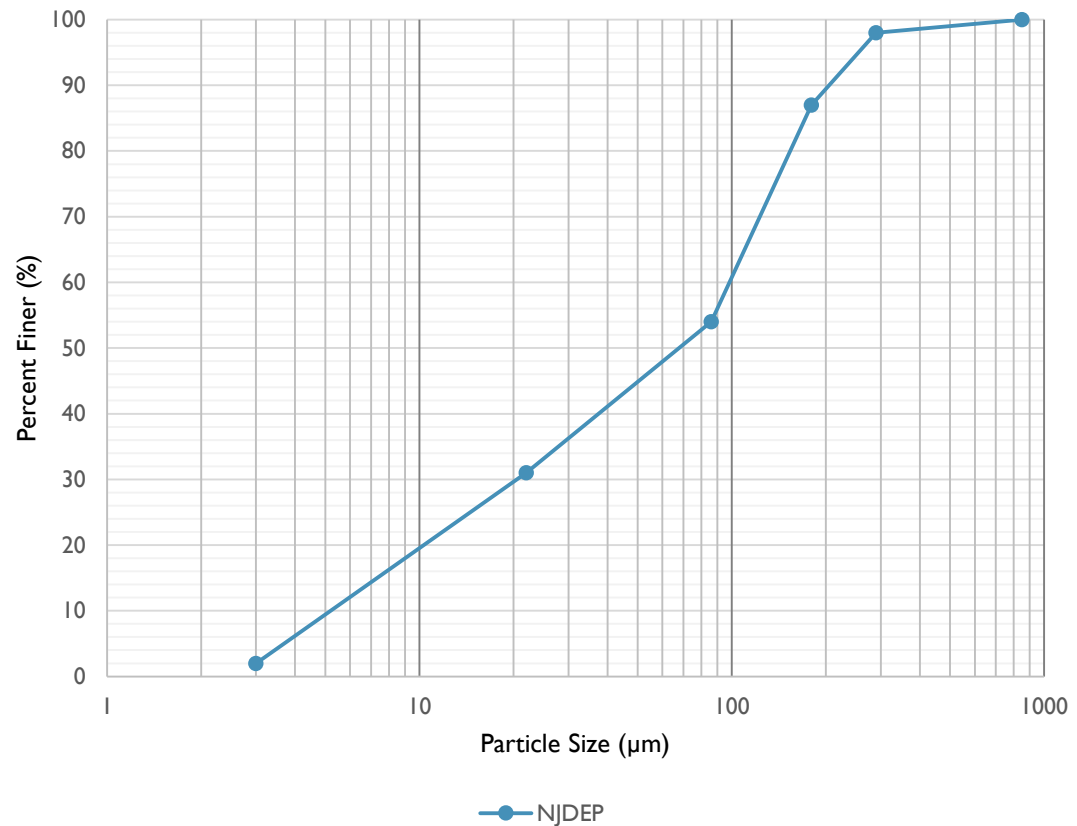
NJDEP PROTOCOL

- Testing Requirements (Background concentrations, influent concentrations, sediment feed, etc.)
- Scour Testing
- Sampling Procedures
- Scaling

NJDEP PROTOCOL: PSD

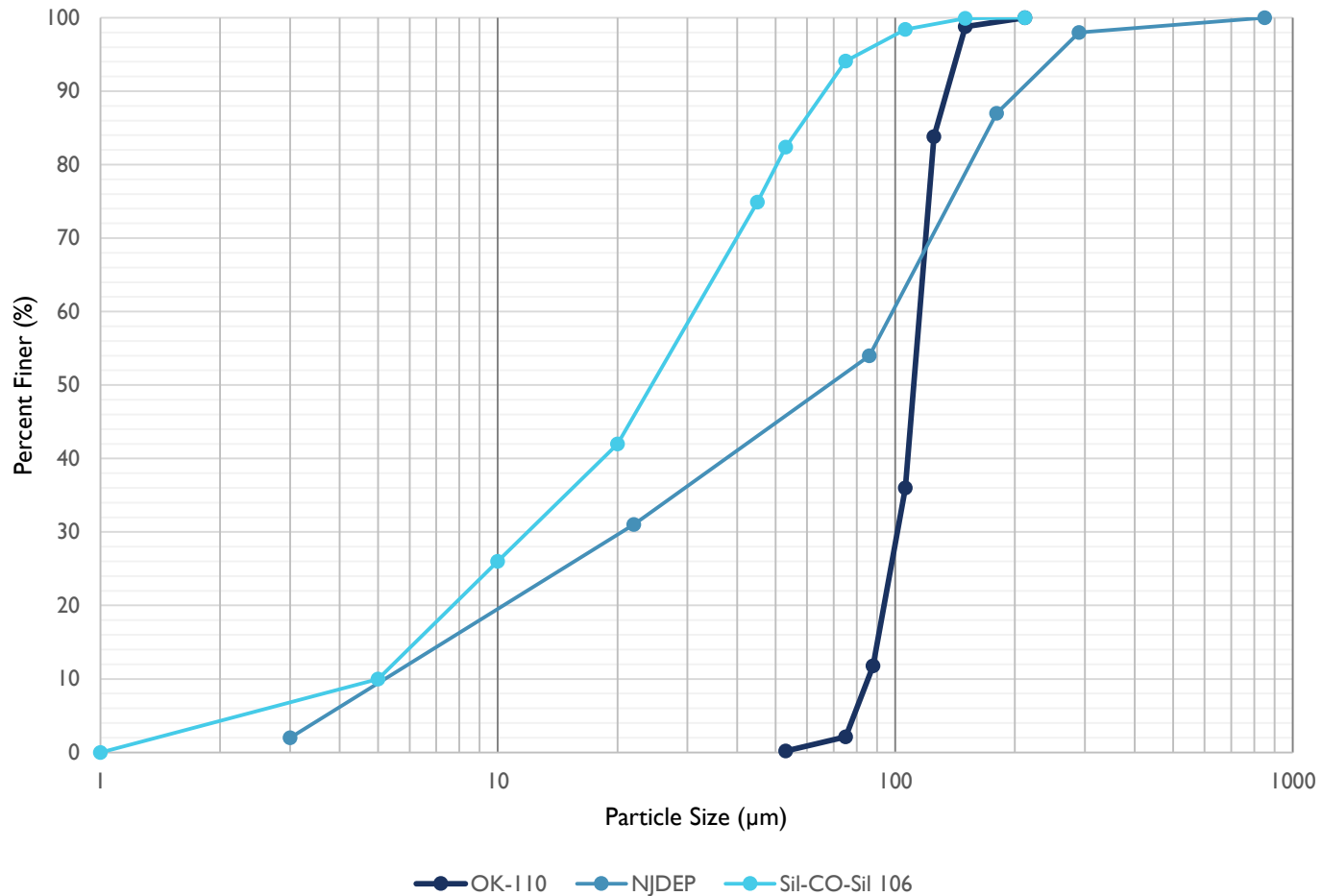
Particle Size (μm)	Minimum % Less Than
1000	100
500	95
250	90
150	75
100	60
75	50
50	45
20	35
8	20
5	10
2	5

Particle Size Distribution Comparison



PSD COMPARISON

Particle Size Distribution Comparison



NJDEP PROTOCOL: TESTING REQUIREMENTS

- Minimum of 10 test runs at MTRF at influent concentration of 200 mg/L
 - Additional test runs may be conducted for sediment mass load capacity
- Test runs continue until maximum driving head is reached
- Influent flow rate reduced to 90% MTRF
 - Continue until max driving head is reached
 - Filter is then considered occluded and testing stops
- Filters not requiring driving head –
 - Continue testing at MTRF until bypass occurs or a reduction in effluent flow rate of 10% MTRF

NJDEP PROTOCOL: SCALING

- **Effective Sedimentation Area:**
Area within filtration MTD where sedimentation occurs
- **Effective Filtration Treatment Area:**
Surface area of the filtration media layer within a filtration MTD
- **Requirements:**
 - Ratio of MTR to Effective Filtration Treatment Area is the same or less, **AND**
 - Ratio of Effective Sedimentation Area to Effective Treatment Area is the same or greater, **AND**
 - Ratio of wet volume to Effective Filtration Treatment Area is the same or greater than the tested unit.
 - If requirements above not met, a second full-scale model may be tested with an MTR difference of at least 250% to validate alternative scaling

NJDEP PROTOCOL: MASS LOADING

- Mass Load Capacity:

Max mass of test sediment that can be captured by the filtration MTD prior to unacceptable loss of hydraulic capacity, head loss, or reduction in pollutant removal efficiency at MTFR

- Continuation of TSS removal efficiency testing

- Determines max mass of sediment captured by filter at 90% MTFR prior to increase of head above maximum driving head of unit

- Evaluate Life-Cycle Performance

- Sediment mass load vs. flow rate at specified driving head
- Sediment mass load vs. head loss at MTFR
- Sediment mass load vs. removal efficiency

NJDEP PROTOCOL: MASS LOADING

- Used to verify longevity
- Determines maximum allowable inflow drainage area
 - Determines max mass of sediment captured by filter at 90% MTFR prior to increase of head above maximum driving head of unit
 - Maximum Inflow Drainage Area (acres) =
$$\frac{\text{Weight of TSS before 10\% loss in MTFR (lbs)}}{600 \text{ lbs per Acre of Drainage Area Annually}}$$



NJDEP PROTOCOL: SIZING

■ Flow-Based

- Calculate water quality flow
- Divide water quality flow by MTRF to determine number of cartridges
- Typically most conservative upstream of detention

■ Inflow Drainage Area (Mass Loading)

- Maximum Inflow Drainage Area (acres) =
$$\frac{\text{Weight of TSS before 10\% loss in MTRF (lbs)}}{600 \text{ lbs per Acre of Drainage Area Annually}}$$
- Typically most conservative downstream of detention

- Current Certified Technologies

<https://www.nj.gov/dep/stormwater/treatment.html>