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CSA Group

TRIECA Presentation

Jose Luis Hernandez
Program Manager, Environment & Climate Change

What is ETV?

- ETV is a process providing independent and credible information on new environmental technologies, by verifying that performance claims are complete, fair and based on reliable test results.
- ETV supports the advancement of innovative environmental technologies in order to meet environmental priorities
- ISO 14034 was published in November 2016, and the implementation of the standard is beginning to take shape.




ETV Objectives

- Increase the trust of investors in innovative environmental technologies.
- Give more credibility to developers of innovative technologies
- Enable technology users to benefit of innovation and select technologies meeting their needs.
- Reduce the risk for investors and purchasers investing in new technologies.
- Facilitate or accelerate the diffusion of eco-innovation on regional, national and international markets.

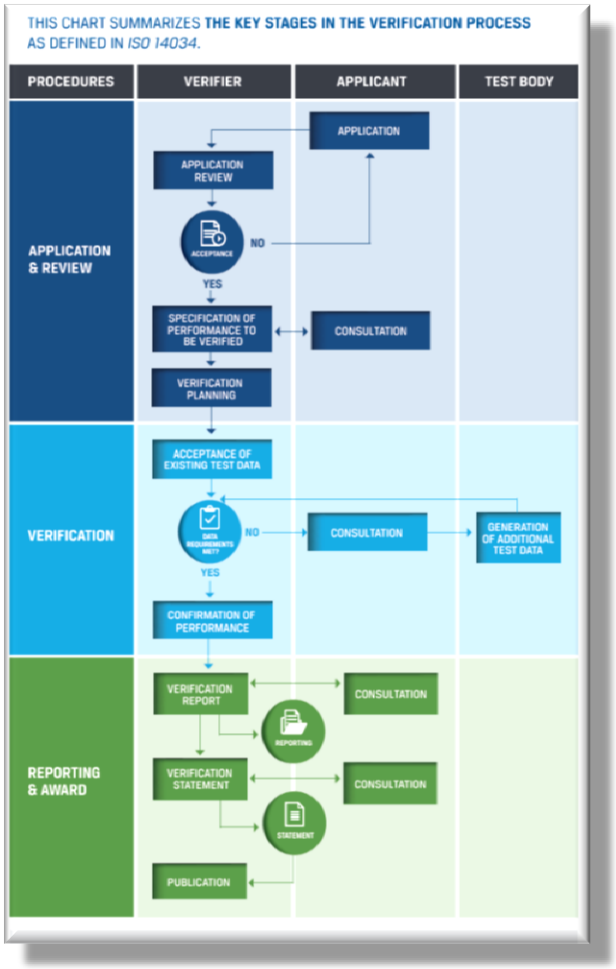
Environmental Technology Verification

Benefits of ETV:

- Differentiates a technology from the competition, providing a company with a distinct market advantage;
- Provides a specific and precise performance claim of the technology, presented in an easily understood format;
- Can expedite permitting and approvals for the use of the technology;
- Can support the patenting process, by providing verified claims;
- Has increasing national and international market recognition;
- Supports Manufactures, Purchasers and Policy Makers.

Environmental Technology Verification

CSA Group is proud to support the introduction of ISO 14034 - *Environmental Technology Verification (ETV)* to the Canadian market.



ETV Process Overview:

1. Application and Review
2. Verification
3. Reporting & Award

Note: Testing is outside the scope of ISO 14034, as illustrated in the diagram.

Important Characteristics of ISO 14034

- ISO 14034 is intended for a verifier, which is *any organization that performs ETV*
- Organizations providing verification as described in ISO 14034 must be accredited to ISO 17020 – *Conformity Assessment: Requirements for the operation of various types of bodies performing inspection.*
- ETV will not substitute the actual testing of a new technology, but will review test results in order to assess the veracity of the performance claim.
- ISO 14034 does **not** void the testing completed by the storm water industry.
- Increased market recognition as an ISO standard and increased application both nationally and internationally.

Next Steps for ISO 14034

- ETVCanada.ca website will continue to provide valuable information
- ISO 14034 can be implemented and used by any verifier.
- The market will determine if **3rd** party independent and credible information on innovative environment technologies is required by an accreditation body.
- SCC is exploring the development of an accreditation program; this program will engage:
  - Inspection Bodies looking to extend their scope of accreditation to include ISO 14034
  - Verifiers looking to become accredited Inspection Bodies
- SCC and CSA will continue to be a point of contact for ISO 14034 inquiries.
- CSA Group will facilitate the Canadian implementation of the ISO 14034 standard

Learn More:

- Join the ETV section of the CSA Communities to learn more about *ISO 14034*, participate in related discussions and receive the latest news. Visit: **csagroup.org/communities**
- To learn more about the ETV verification process, or search the inventory of verified technologies, please visit: **etvcanada.ca/**
- To stay up-to-date on the development of the ETV accreditation program, or get involved in the development of this, or other, international standards. Visit: scc.ca

Thank you!

For further information, please contact:

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CSA Group

Oil Grit Separator Testing and Verification

Canadian Environmental Technology Verification Program

Tim Van Seters

TRIECA Conference

March, 2017

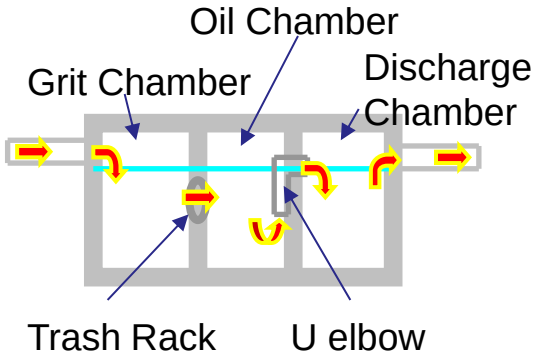
Sustainable Technologies EVALUATION PROGRAM

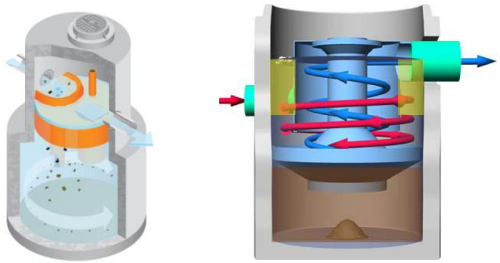
The Living City Foundation

Toronto and Region Conservation for The Living City

Oil Grit Separators

- OGS are designed to capture settleable solids, trash/debris, floatables, oil and grease in urban runoff.
- Require regular maintenance to function effectively
- Widely used to:
  - improve the quality of runoff from urban developments
  - provide pre-treatment to other downstream stormwater controls
  - Temporary spill containment





Source: Saddoris et al, 2010

Benefits of Standardized Testing and Verification of OGS

- Response to call from vendors and municipalities for a fairer and more scientific basis for technology selection and approval
- Creates an even playing field among all vendors of OGS devices
- Establishes a scientific and credible basis for assessing the accuracy of performance claims
- Facilitates the review and approval of OGS devices and help ensure that selected stormwater infrastructure is suitable for the tributary areas being serviced
- Improves environmental outcomes

Looking back at the long road travelled

- 2013: TRCA developed national *Procedure for Laboratory Testing of OGS* in association with 32 member advisory committee
- 2014 : Sediment mix was sourced. First laboratories started testing
- June 2014: Minor revisions were made to the Procedure leading to the release of a slightly modified version
- Ongoing: CETV Bulletins released clarifying rationale for revisions and providing additional notes on data analysis and potential errors
- 2015 and 2016: Laboratory testing continued
- 2016 First OGS verifications released. Expect to have several verifications completed by June 2017
- January 2017: New ISO standard adopted by CETV

Objectives of the Test Procedure

- Quantify the mass, by particle size class, of sediment particles trapped by a device under different surface loading rates;
- Present and analyze data to show device efficiency as a function of particle size and flow rate, and to propose scaling relationships for predicting the efficiency of untested devices in the same device classification;
- Assess the potential for scour of sediment retained by an MTD at medium to high flow rates across a range of particle size fractions.
- Assess the potential for re-entrainment of free oil trapped by an MTD at different flow rates

Test Facilities and Verification Organizations

- The testing shall be conducted by an independent, **third party** testing facility
  - Current test labs include:
    - Centre des technologies de l'eau (CTE) - Quebec
    - Good Harbour Labs – Ontario
    - Lasalle | NHC Inc - Quebec
    - Alden laboratories – Massachusetts
    - University of Florida
- Sample analysis shall be conducted by an **accredited laboratory**
- **An independent verification organization** reviews the analysis and delivers a verification report

Sample Fact Sheet

CANADIAN ENVIRONMENTAL TECHNOLOGY VERIFICATION

Enhancing the Credibility of Environmental Technologies

TECHNOLOGY VERIFIED: SDD3 Oil Grit Separator®

Performance Claim(s)

Capture test:

During the sediment capture test, the NEXT Stormwater Solutions' SDD3 OGS device with a false floor set to 50% of the manufacturer's recommended maximum sediment storage depth and a constant influent test sediment concentration of 200 mg/L, removed 73, 67, 61, 53, 50, 52, 49 and 47 percent of influent sediment by mass at surface loading rates of 40, 80, 200, 400, 600, 1000, 1400 and 1800 L/min/m2, respectively.

Scour test:

During the scour test, the NEXT Stormwater Solutions' SDD3 OGS device with preloaded test sediment reaching 50% of the manufacturer's recommended maximum sediment storage depth generated corrected effluent concentrations of 0, 9.3, 4.7, 24.3, and 10.5 during a continuous 30 minute test run with 5 minute duration surface loading rates of 200, 800, 1400, 2000, and 2600 L/min/m2, respectively.

Verification is based on independent performance testing completed in accordance with the *Procedure for Laboratory Testing of Oil-Grit Separators (Version 3.0, June 2014)*.

VERIFIED PERFORMANCE*:
OCTOBER 2016

License Number: ETV 2016-04

Issued to: Next Solutions (8091200 CANADA INC.)

Expiration Date: OCTOBER 31, 2019

John D. Wiebe, PhD
Executive Chairman
GLOBE PERFORMANCE SOLUTIONS

Canada

* This verification conforms to the Canadian ETV Program's General Verification Protocol and the ISO/FDIS 14034:2015(E). Please refer to Technology Fact Sheet for additional information on the verification of this performance claim.

Member of Conservation Ontario

ental Technology Verification

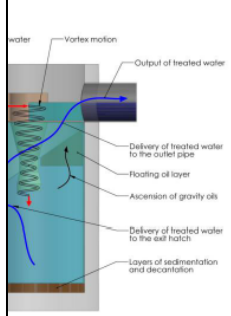
DIAN ETV VERIFIED

Grit Separator®

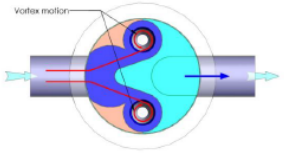
for NEXT Stormwater Solutions

description and application

s an Oil-Grit Separator technology that uses both gravitational and centrifugal forces to capture and ments from stormwater runoff. The centrifugal forces are generated by the passive movement of hrough twin hourglass shaped cones within the technology. Suspended sediments are funneled oving water column in the center of the vortex and eventually dropped out of suspension and n of the unit, returning clean water back up through the exit hatch.



b)



ctional and b) Top view flow diagrams of NEXT Stormwater Solutions' SDD3 oil-grit separator

cones are large at the top, narrow in the middle to accelerate the hydraulic vortex effect, and wide e a double vortex effect that optimizes particle separation. This design was also intended to reduce n of previously captured sediment. For very high stormwater flows, excess water will bypass above nd flow straight into the exit hatch without flowing downward through the cones. Periodic are recommended once every 6 months and can be done through the unit's top hatch, which also g out captured sediments using a vacuum truck combined with a water pressure jet.

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Canada

ntal Technology Verification

es (%) at specified surface loading rates.

Surface loading rate (L/min/m²)							
40	80	200	400	600	1000	1400	1800
97.9	86.3	100*	91.3	93.6	100*	91.0	94.4
83.9	95.9	94.1	97.6	100*	96.9	100*	94.4
90.3	95.1	99.8	90.1	93.0	96.3	90.5	94.4
100*	100*	99.8	99.8	88.9	95.1	89.4	88.8
97.9	92.3	94.1	65.1	63.0	74.5	61.3	52.4
71.4	72.3	49.0	32.6	23.3	18.2	18.1	16.1
70.0	43.1	14.0	13.3	7.2	2.5	2.5	6.9
31.8	13.8	6.0	5.8	1.3	4.4	4.5	3.3
18.8	25.3	14.1	5.5	6.3	6.6	6.5	5.3
11.7	6.4	5.9	4.1	4.7	9.2	6.6	3.0
73	**67**	**61**	**53**	**50**	**52**	**49**	**47**

d to be above 100%. Calculated values were between 102.7 and 117.5%. See text and Bulletin # CETV 2016-11-0001 for

the particle size distribution (PSD) of the three sample average of the test sediment to the PSD t each of the tested surface loading rates. In general, the capture efficiency for fine particles ng rates increased.

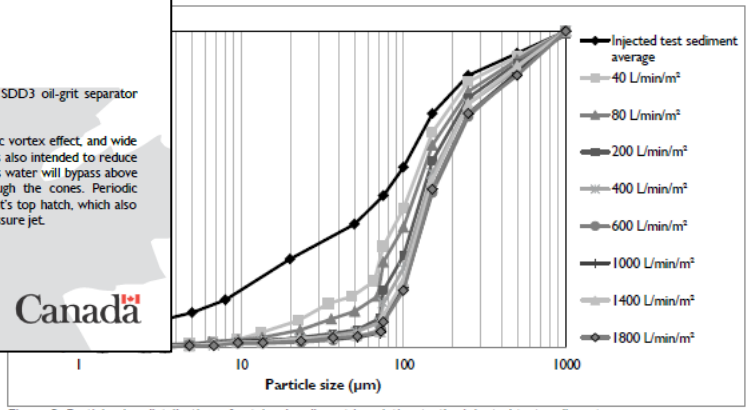

Figure 3. Particle size distribution of retained sediment in relation to the injected test sediment average.

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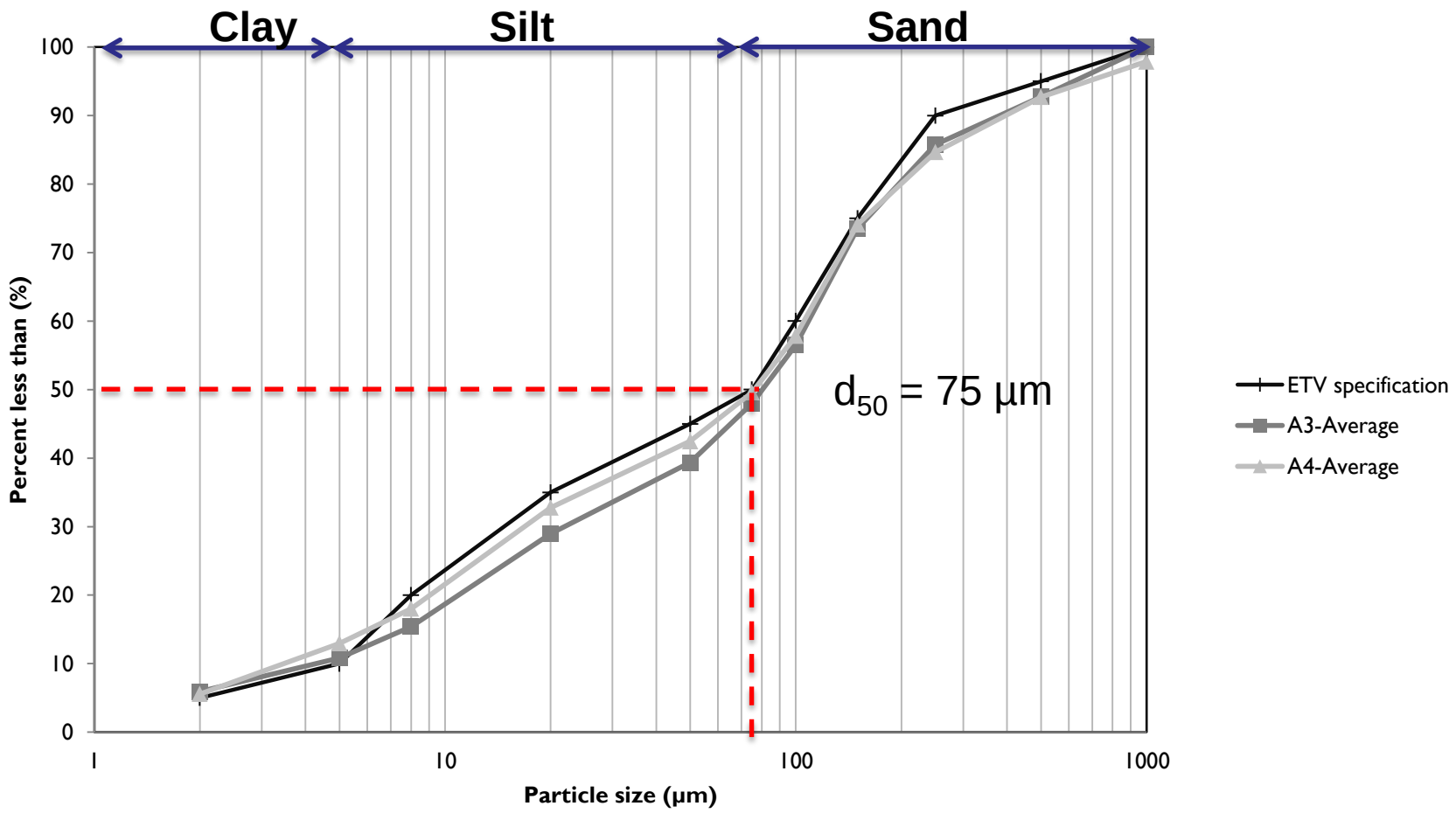
Example Results: PSD match



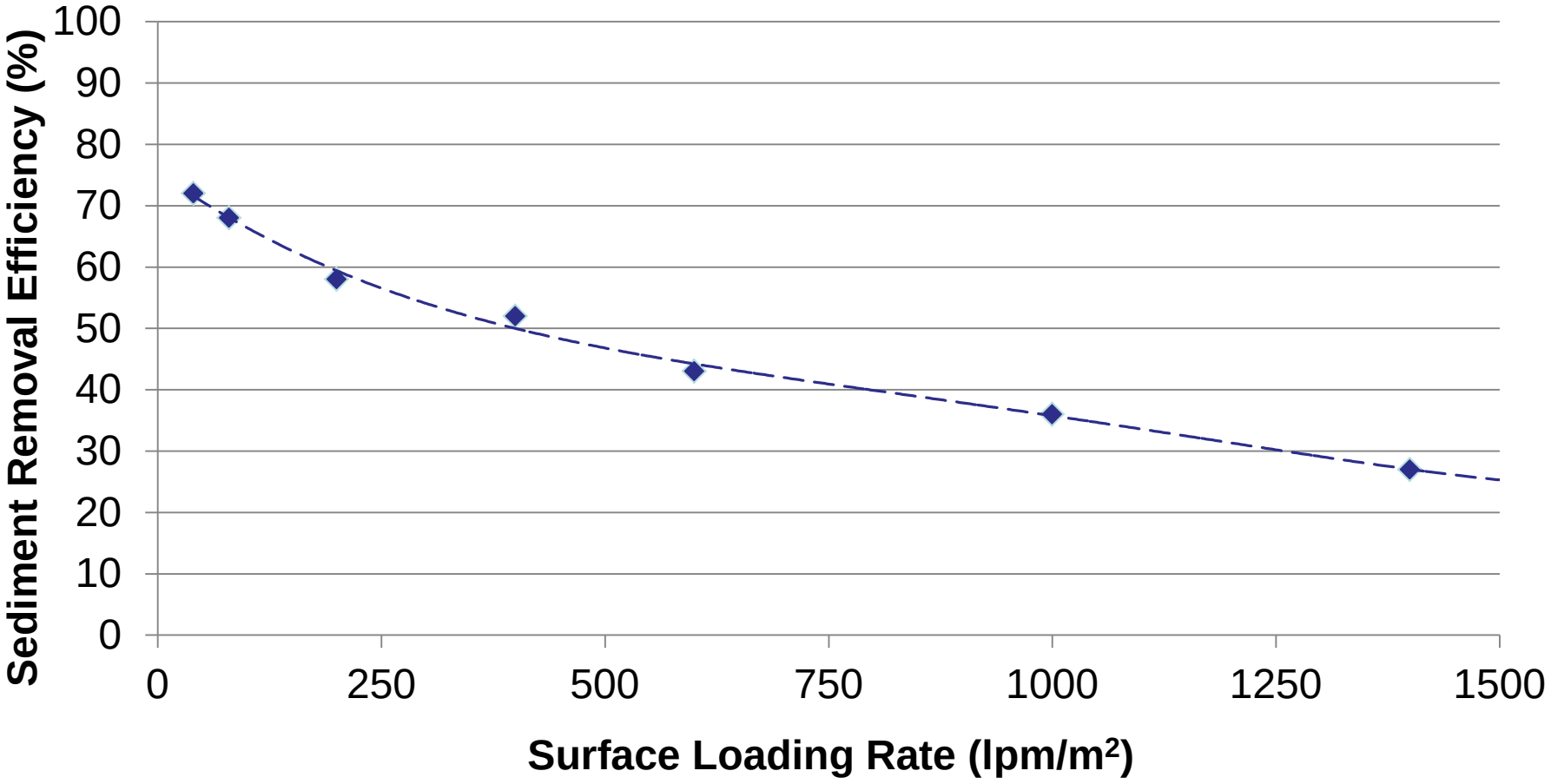
Example Results: Sediment Capture

Removal Efficiencies by Surface Loading Rate and Particle Size Fraction

Particle size fraction (µm)	Surface loading rate (L/min/m^2)							
	40	80	200	400	600	1000	1400	1800
500-1000	97.9	86.3	100*	91.3	93.6	100*	91.0	94.4
250 - 500	83.9	95.9	94.1	97.6	100*	96.9	100*	94.4
150 - 250	90.3	95.1	99.8	90.1	93.0	96.3	90.5	94.4
100 - 150	100*	100*	99.8	99.8	88.9	95.1	89.4	88.8
75 - 100	97.9	92.3	94.1	65.1	63.0	74.5	61.3	52.4
50 - 75	71.4	72.3	49.0	32.6	23.3	18.2	18.1	16.1
20 - 50	70.0	43.1	14.0	13.3	7.2	2.5	2.5	6.9
8 - 20	31.8	13.8	6.0	5.8	1.3	4.4	4.5	3.3
5 – 8	18.8	25.3	14.1	5.5	6.3	6.6	6.5	5.3
< 5	11.7	6.4	5.9	4.1	4.7	9.2	6.6	3.0
All particle sizes by mass balance	**73**	**67**	**61**	**53**	**50**	**52**	**49**	**47**

High confidence in mass balance values

Example Results: Sediment Removal Performance Curve



Application of results for approvals

- Different approaches being considered in different jurisdictions
- Weighting factors by rainfall vs flow

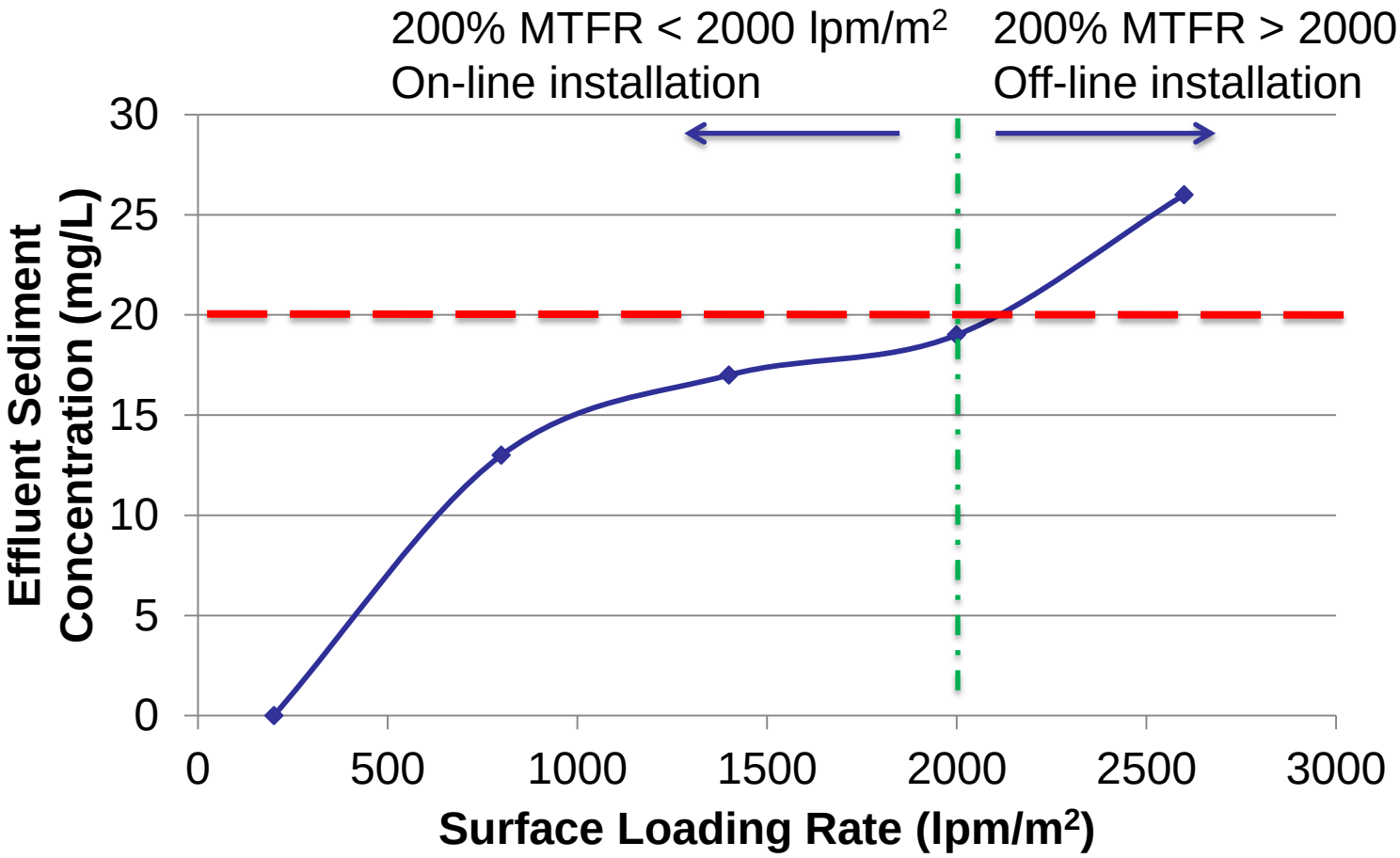
	Weighting Factor		
MTFR	Pearson	Quebec	NJDEP
25%	35	35	25
50%	30	25	30
75%	15	20	20
100%	10	10	15
125%	10	10	10

- Flow Rate Criteria: design storms, 90th percentile storm, return period storm (*e.g* 1 year or 2 year)?
- Rules need to be simple to apply, easy to verify and transparent to create even playing field
- Province of Quebec has developed a consistent set of rules for application of the results based on historical rainfall records and return period storms

Sediment Scour Test

- Sediment preloaded into the unit
- Continuous test at five flow rates
- Highest flow rate is approx 200% MTFR
- Effluent concentrations are measured and reported for each flow rate
- D5 correction is permitted to mathematically remove fine sediment particles that were mostly not retained during the sediment capture test
- Similar test for oil beads (optional)

Example of Scour Test Result and Interpretation



Hypothetical maximum scour conc. for on-line installation

Application of results to other unit sizes

- Scaling of results from the tested unit to larger untested unit is to be done the same way as described in the NJDEP protocol
  - Based on similar surface loading rates and geometric proportions
  - Conservative methodology
  - Alternative scaling approach to be supported by testing 3 different device sizes

- Verification of sizing in relation to scaling rules not part of the verification process but application of scaling to all available sizes of verified units shall be provided in a separate communication

Next Steps

- Continued testing and verification of OGS units
- Consultation with municipalities on interpretation procedures

Contact Information

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