



# UNIVERSITY OF MASSACHUSETTS AT AMHERST

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## MASTEP Technology Review

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**Technology Name:** Kristar FloGard Dual-Vortex Hydrodynamic Separator

**Studies Reviewed:** NJCAT Technology Verification FloGard Dual-Vortex Hydrodynamic Separator, KriStar Enterprises, Inc. August 2007.

FloGard Dual Vortex Hydrodynamic Separator Testing Using US Silica F-110 Sand

**Date:** March 13, 2008

**Reviewer:** Sarah Titus

**Rating:** 2

**Brief rationale for rating:** This rating is primarily based on the NJCAT review of a laboratory study conducted by Alden Research Laboratories and paid for by Kristar Enterprises, Inc. This was a well run study modeled after NJDEP protocol using a full scale model DVS-48. Scour tests were done with initial sediment loading of 50 and 100% at 5 flow rates. They also ran removal tests with the recommended test sediment at 5 flow rates and 3 concentrations each. The lab misinterpreted a maintenance statement from the manufacturer and conducted the sediment removal tests with 100% initial sediment loading instead of the recommended 50%. This will result in a more conservative estimate of removal efficiency for these tests. 60% removal of sediments (SSC method) was obtained in the study. The FloGuard Dual Vortex Hydrodynamic separator has received Conditional Interim Certification, January 2008.

The second study was conducted by the vendor. They ran 9 tests using U.S. Silica F-110 sand. 35 micron filter bags were used to capture sediments passing through the system for mass balance determination. It is possible that some fines escaped, thereby adversely affecting accuracy of measurements. Flow rates tested were approximately 0.4, 0.8 and 1.2 CFS, or 25%, 50% and 75% of the advertised design flow of the model VS-48. Removal rates for these flows were reported as 81.4%, 52.9%, and 24.5% respectively. This suggests that little sediment removal may occur when the system operates at the treatment design rate. Influent sediment concentrations were rather narrow (135 - 150 mg/l) but within NJ recommended range (100-300 mg/l).

Mass balance method used to calculate removal efficiency. This is considered the most accurate method for laboratory tests

Test site plan, test methods description, and raw data were provided in the test report.

The unit was tested at conservative flow rates, provided little information on sediment size distribution, no scour tests performed, no quality control information provided.

### **TARP Requirements Not Met\*:**

- TSS data yielded variable results and was not used for the verification; SSC method was used instead
- No documentation of a Quality Assurance Project Plan
- SOL not calculated
- No statistical analysis
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\* Criteria also based on NJDEP laboratory testing guidelines.