

Scattering Meter Calibration Sheet

07/28/04

Customer: Webb Research Corporation

Wavelength: 660

S/N#: BBFL2SLO-136

Job #: 406005

Tech: MJ

Use the following equation to obtain "scaled" output values:

$$\beta(\theta c) \text{ m}^{-1} \text{ sr}^{-1} = \text{Scale Factor} \times (\text{Output} - \text{Dark Counts})$$

- **Scale Factor for 660 nm** = 4.11E-06 (counts)
- **Output** = meter output (counts)
- **Dark Counts** = 58 (counts)

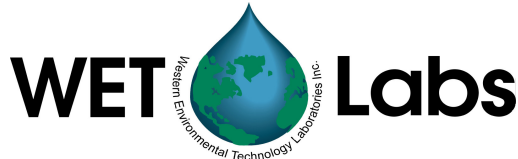
Instrument Resolution = 0.9892 (counts) 4.07E-06 ($\text{m}^{-1} \text{sr}^{-1}$)

Definitions:

- **Scale Factor:** Calibration scale factor, $\beta(\theta c)/\text{counts}$. Refer to User's Guide for derivation.
- **Output:** Measured signal output of the scattering meter.
- **Dark Counts:** Signal obtained by covering detector with black tape and submersing sensor in water.

Instrument Resolution: Standard deviation of 1 minute of collected data.

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ECO CDOM Fluorometer Characterization Sheet

Date: 7/28/2004

Customer: Webb Research Corp.

Job #: 406005

S/N#: **BBFL2SLO-136**

CDOM (Quinine Dihydrate Equivalent) concentration expressed in ppb can be derived using the equation:

$$\text{CDOM (QSDE)} = \text{Scale Factor} * (\text{Output} - \text{Clean Water Offset})$$

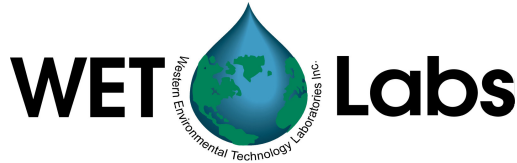
Clean Water Offset (CWO)	Digital 71 counts
Scale Factor (SF)	0.0840 ppb/l/count
Maximum Output	4123 counts
Resolution	1.6433 counts
Ambient temperature during characterization	23.3 °C

CWO: Clean Water Offset value obtained using pure filtered de-ionized water.

SF: Determined using the following equation: $SF = x \div (\text{output} - \text{CWO})$, where x is the concentration of the solution used during instrument characterization. SF is used to derive instrument output concentration from the raw signal output of the fluorometer.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.



ECO Chlorophyll Fluorometer Characterization Sheet

Date: 07/28/04

Customer: Webb Research Corp.

Job #: 406005

S/N#: **BBFL2SLO-136**

Chlorophyll concentration expressed in $\mu\text{g/l}$ can be derived using the equation:

$$\text{CHL } (\mu\text{g/l}) = \text{Scale Factor} * (\text{Output} - \text{Clean Water Offset})$$

Clean Water Offset (CWO)	58 counts
Chl. Equivalent Concentration (CEC)	1873 counts
Scale Factor (SF)	0.0129 $\mu\text{g/l/count}$
Maximum Output	4122 counts
Resolution	1.0750 counts
Ambient temperature during characterization	23.3 $^{\circ}\text{C}$

CWO: Clean Water Offset value obtained using pure filtered de-ionized water.

CEC Signal output of the fluorometer when using a fluorescent proxy that has been determined to be approximately equivalent to 25 $\mu\text{g/l}$ of a *Thalassiosira weissflogii* phytoplankton culture.

SF: Used to derive chlorophyll concentration from the signal output of the fluorometer. The scale factor is determined using the following equation: $\text{SF} = 25 \div (\text{CEC} - \text{CWO})$. For example: $25 \div (2865 - 43.5) = 0.00886$.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

The relationship between fluorescence and chlorophyll-a concentrations in-situ is highly variable. The scale factor listed on this document was determined using a mono-culture of phytoplankton (*Thalassiosira weissflogii*). The population was assumed to be reasonably healthy and the concentration was determined by using the absorption method. To accurately determine chlorophyll concentration using a fluorometer, you must perform secondary measurements on the populations of interest. This is typically done using extraction-based measurement techniques on discrete samples. For additional information on determining chlorophyll concentration see "Standard Methods for the Examination of Water and Wastewater" part 10200 H, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation.