Suspended Solid (SS)-Turbidity Correlation for Monitoring Dredging

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35th Annual Conference of the International Association for Impact Assessment:

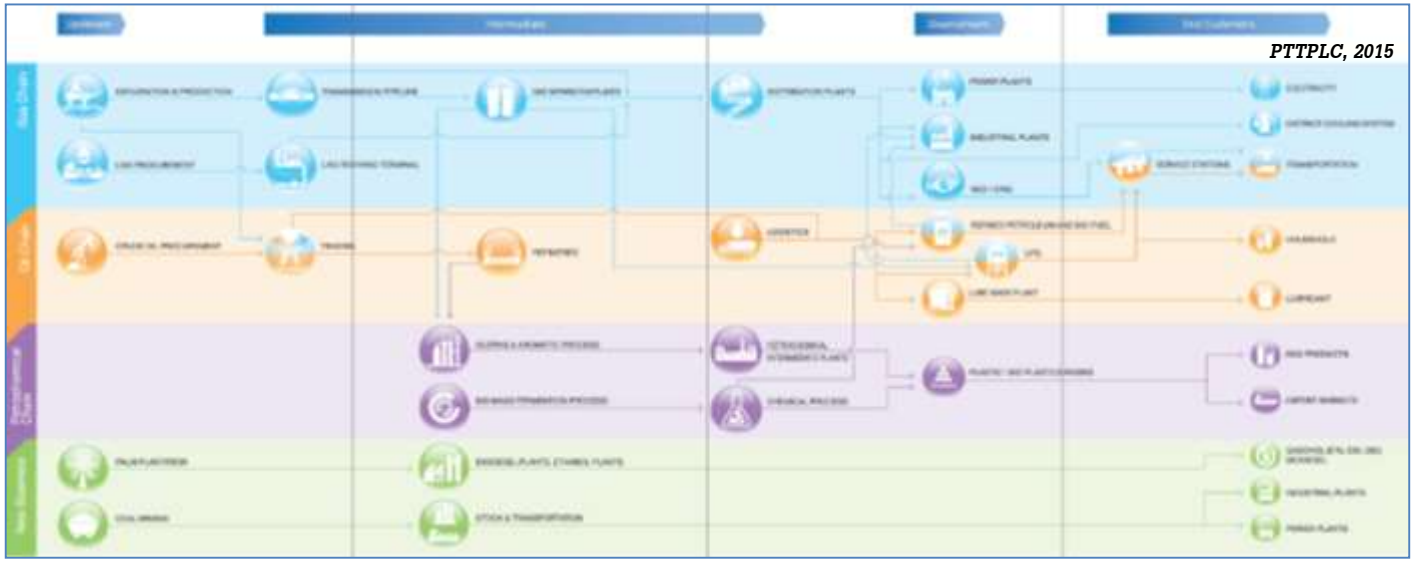
IMPACT ASSESSMENT IN THE DIGITAL ERA, Firenze Fiera Congress & Exhibition Center / Florence, Italy

PTT Public Company Limited

- Former Petroleum Authority of Thailand (PTT) was established on December 29, 1978 then corporatized into a public company limited on October 1, 2001.
- Stated Enterprise Company

Thai Premier Multinational Energy Company

- Business covering Upstream, Intermediate, Downstream and End Users.



For further information, please visit us at www.pttplc.com

Project Study Area

Impacts of SS and Turbidity

Suspended Solids and Turbidity

Decrease light penetration

Settled to dead zone

Potential Impact

- Decrease Photosynthesis
- Decrease Dissolved Oxygen

- Visual Impact
- Limit to Aquatic Growth
- Cause Death of Aquatic Lives

Thailand Regulation ; Notification of the National Environment Board No. 27, B.E. 2549 (2006)

" SS should not exceed the sum of daily or monthly or yearly average and the standard deviation."

Necessity of SS-Turbidity Correlation

Dredging Activity

Effect to Water Quality

Environmental Regulation

EIA

Marine Department

Mitigation Measures

Monitoring Measures

Construction Period

Operation Period

Impact

No

Continue

Yes

Immediately Stop

Impact

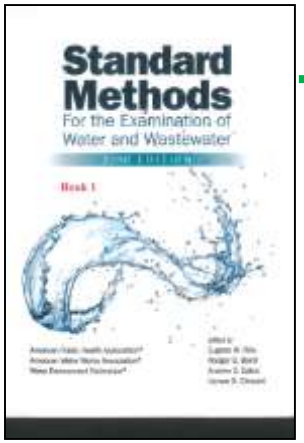
No

Continue

Yes

Corrective Action

Principle of Turbidity Analysis

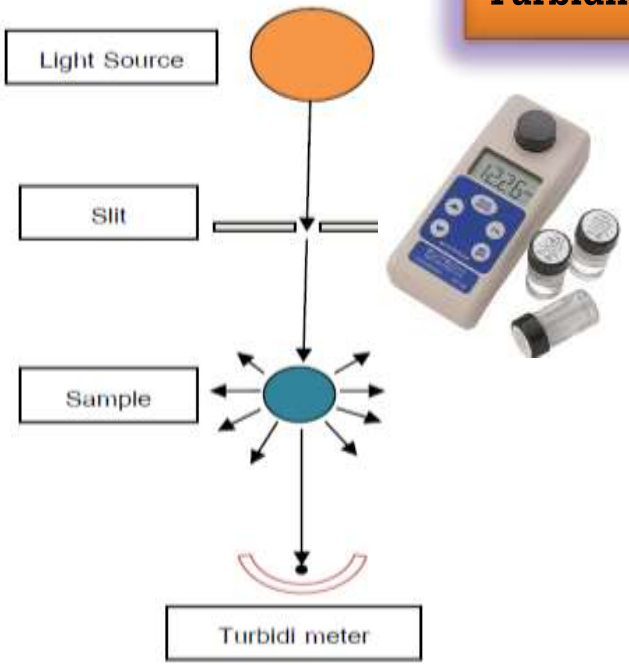


Nephelometric Method

Comparison of the intensity of light scattered by the sample to the standard reference under the same condition

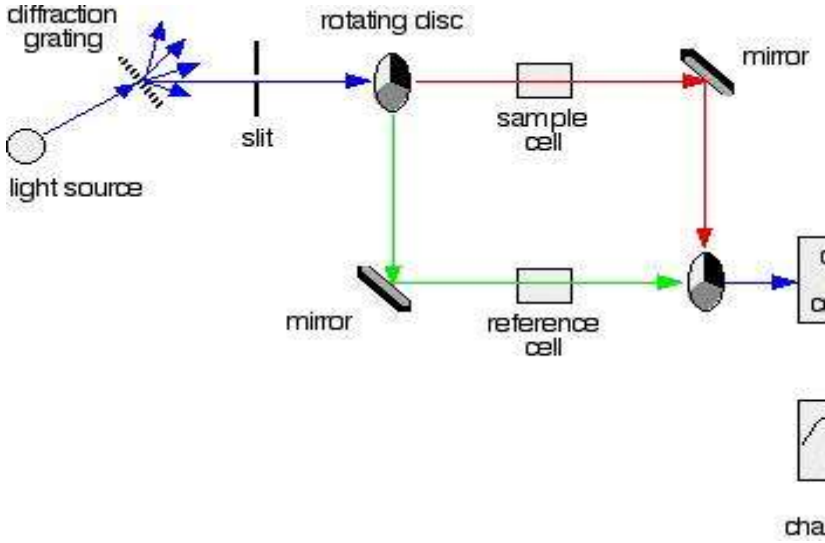
Onsite

Turbidimeter

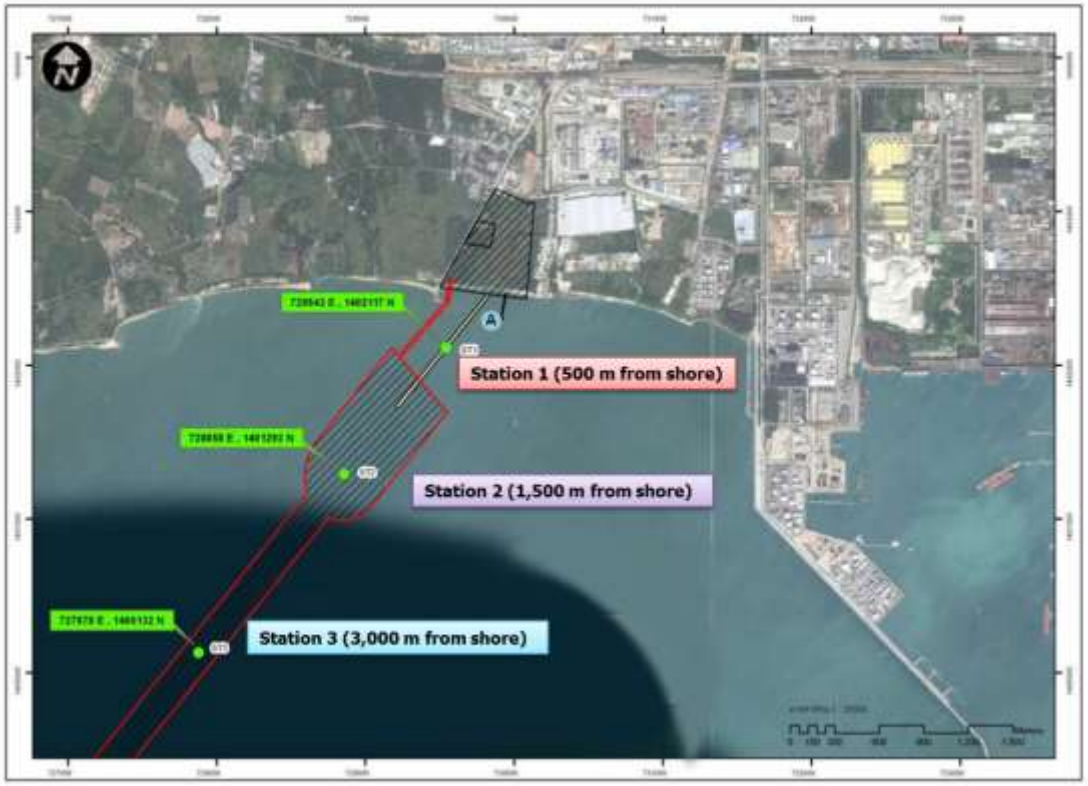


UV-VIS Spectrophotometer

Laboratory



Sampling Methods



Navigating to Location by GPS

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Measurement of Seawater Depth & Other Physical Condition

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Sampling 180 L of Seawater

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Sampling 20 Kg of Sediment

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Sampling Preservation

Depth Measurement by Depth Guage

Grab Sampling by Kemmerer Sampler

Grab Sampling by Petersen Grab Sampler

Remark: Certified Results by United Analyst and Engineering Consultant Company Limited (UAE), Thailand

Experiment

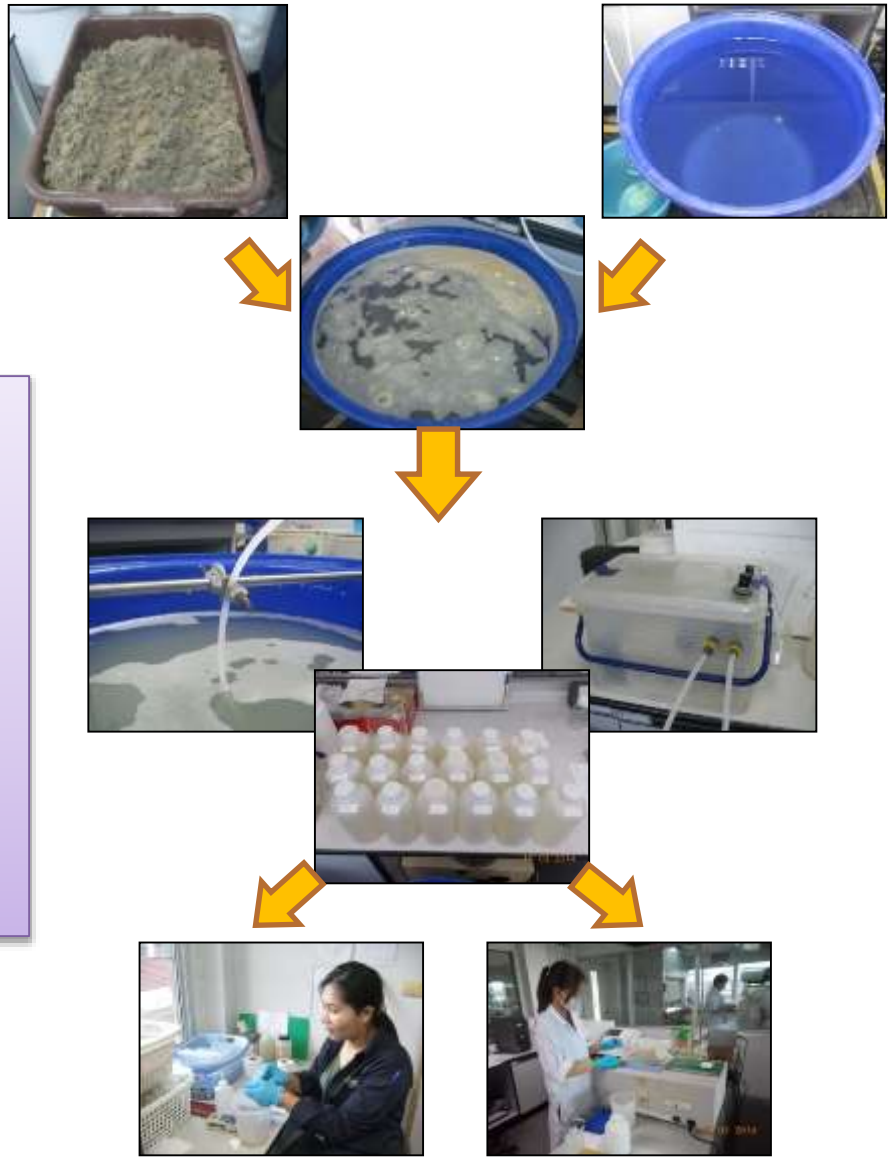
Mixing Seawater 180 Litres
with Sediment 20 Kg

After Completely Mixing
Settle for 1 minute prior sampling

- First 11 minutes, Sampling every minute
- 12 minutes later, Sampling every 2 minutes
- 12 minutes later, Sampling every 3 minutes
- 40 minutes later, Sampling every 10 minutes
- 120 minutes later, Sampling every 30 minutes
- 12 hours later, Sampling every 6 hours
- 48 hours later, Sampling every 12 hours

Measurement of Turbidity & SS

Build SS & Turbidity Correlation Curve



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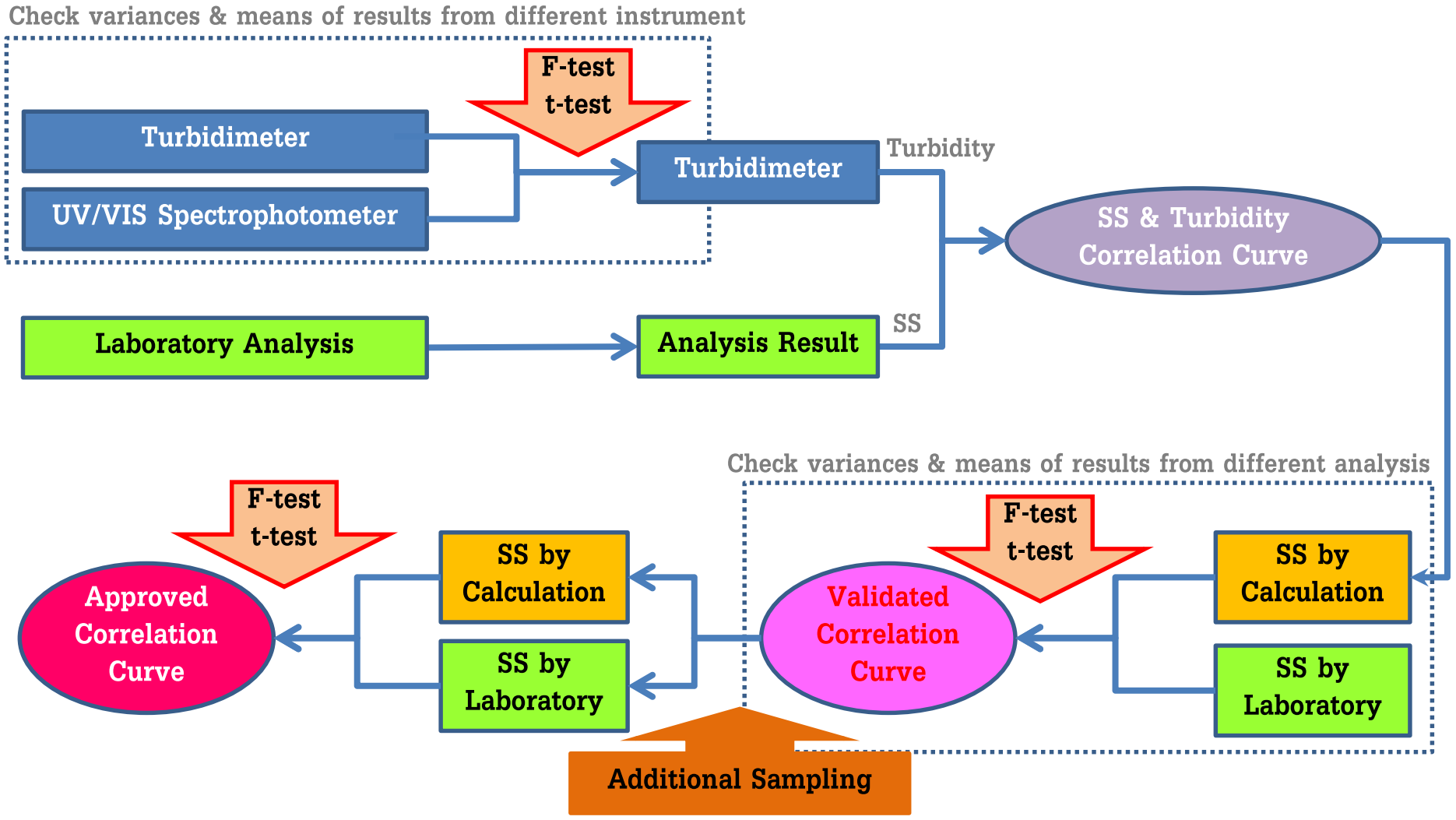
Quality Assurance



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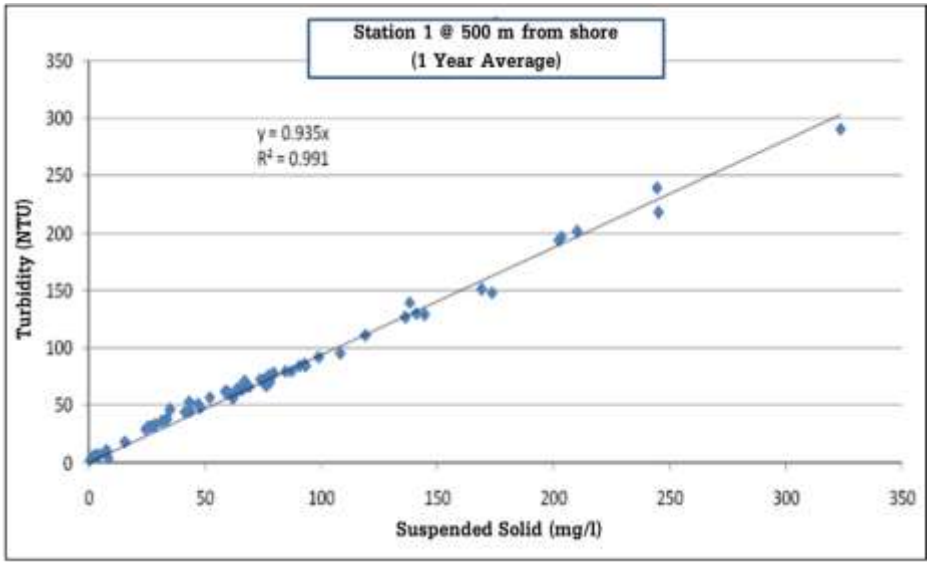
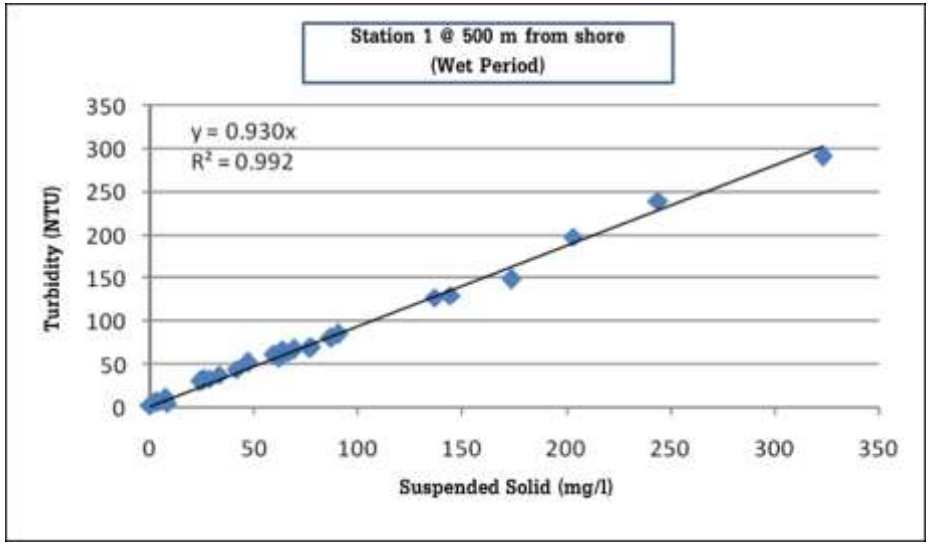
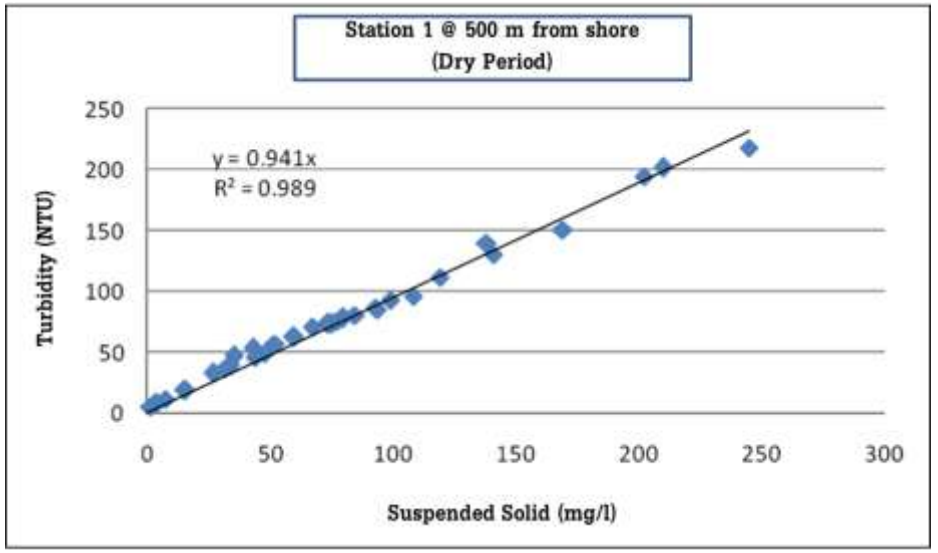
SS-Turbidity Correlation for Monitoring Dredging at 500 m from shore



Wet Period

Dry Period





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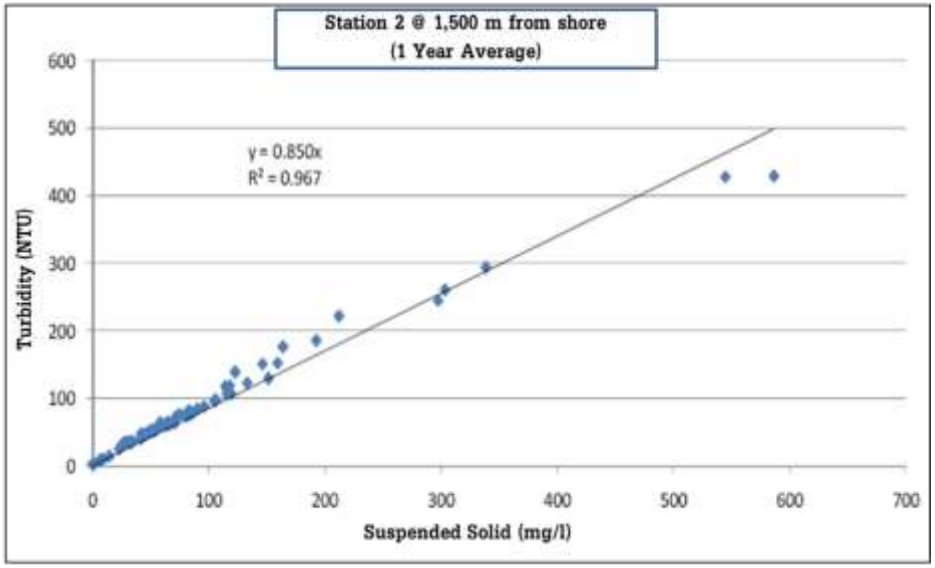
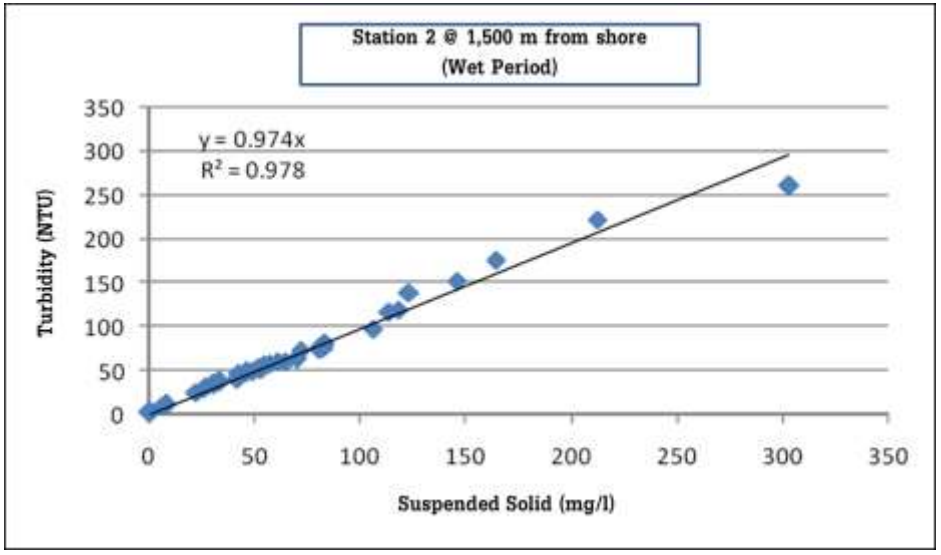
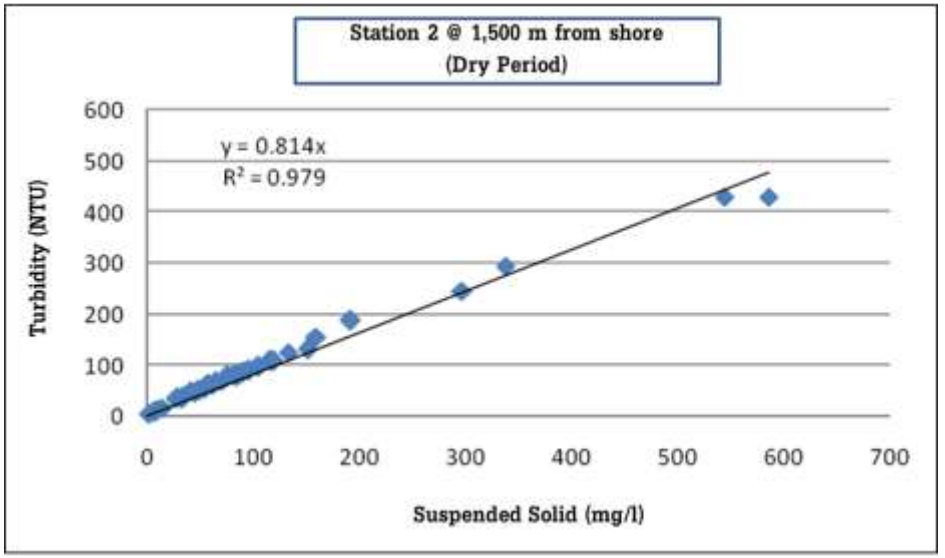
SS-Turbidity Correlation for Monitoring Dredging at 1,500 m from shore

Wet Period



Dry Period





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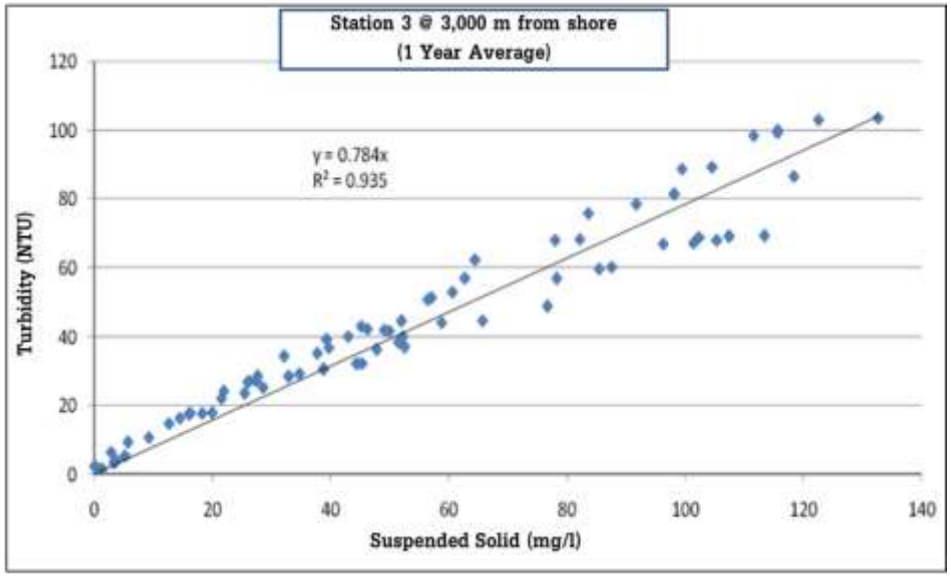
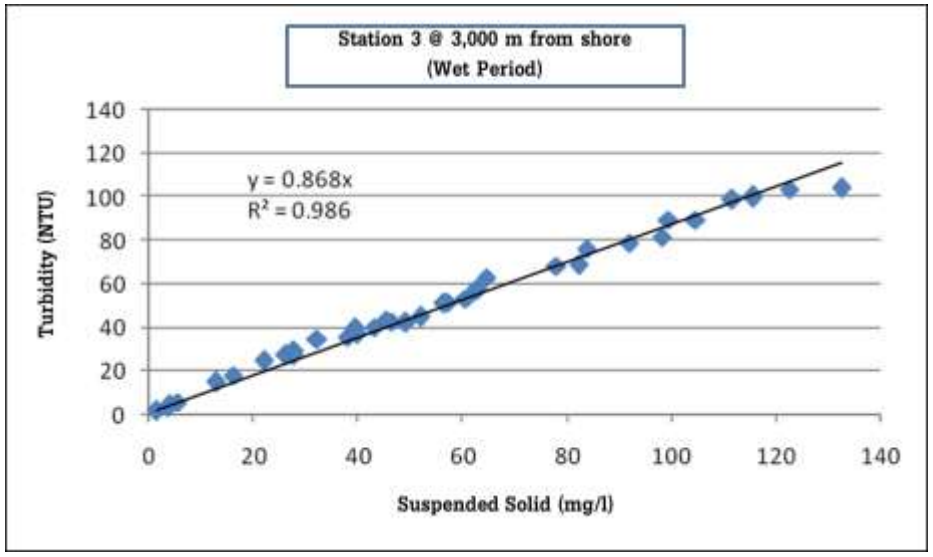
Results

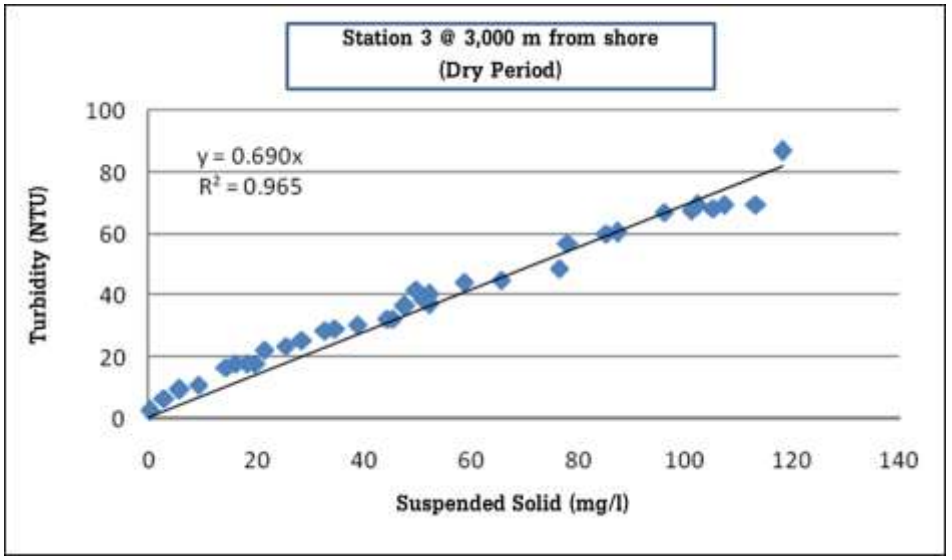
SS-Turbidity Correlation for Monitoring Dredging at 3,000 m from shore

Wet Period



Dry Period





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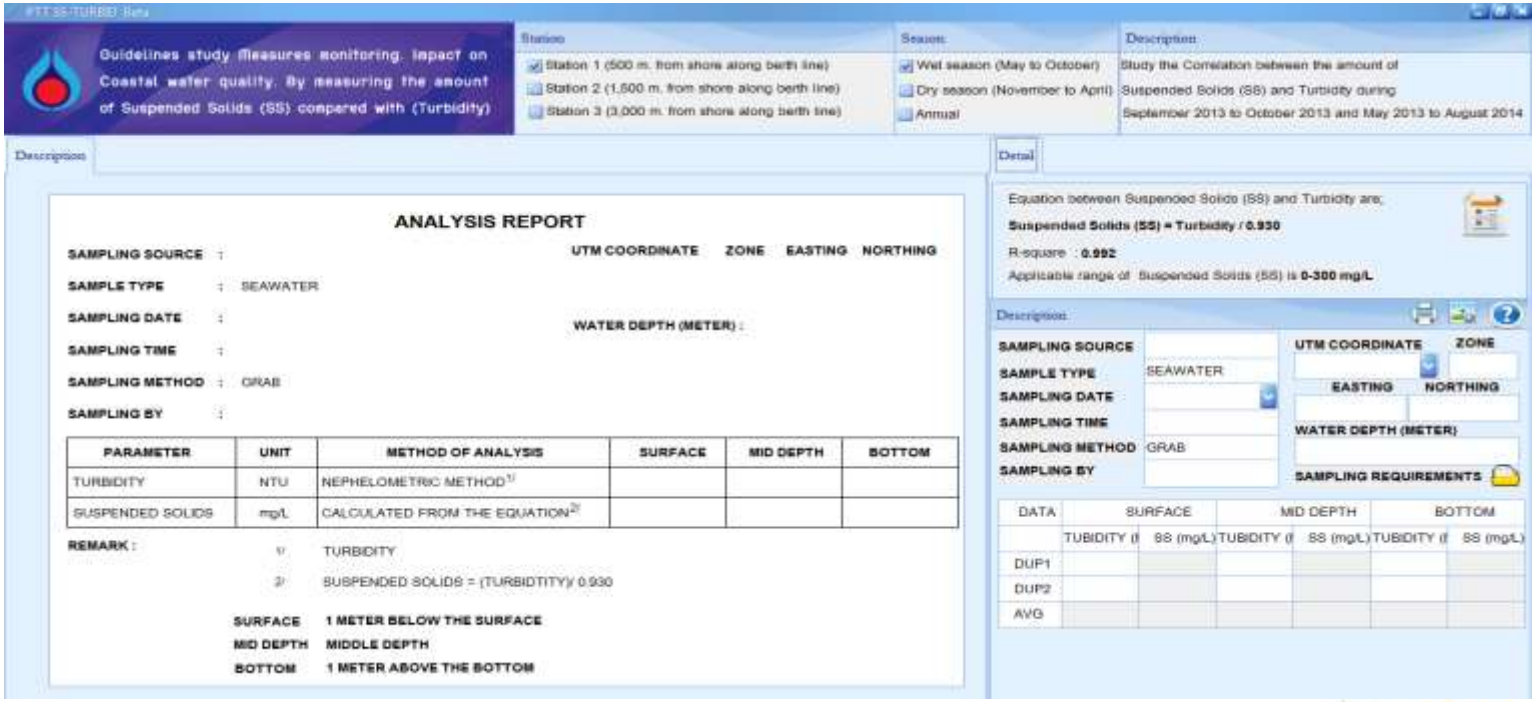
SS-Turbidity Correlation Software



Thank You

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