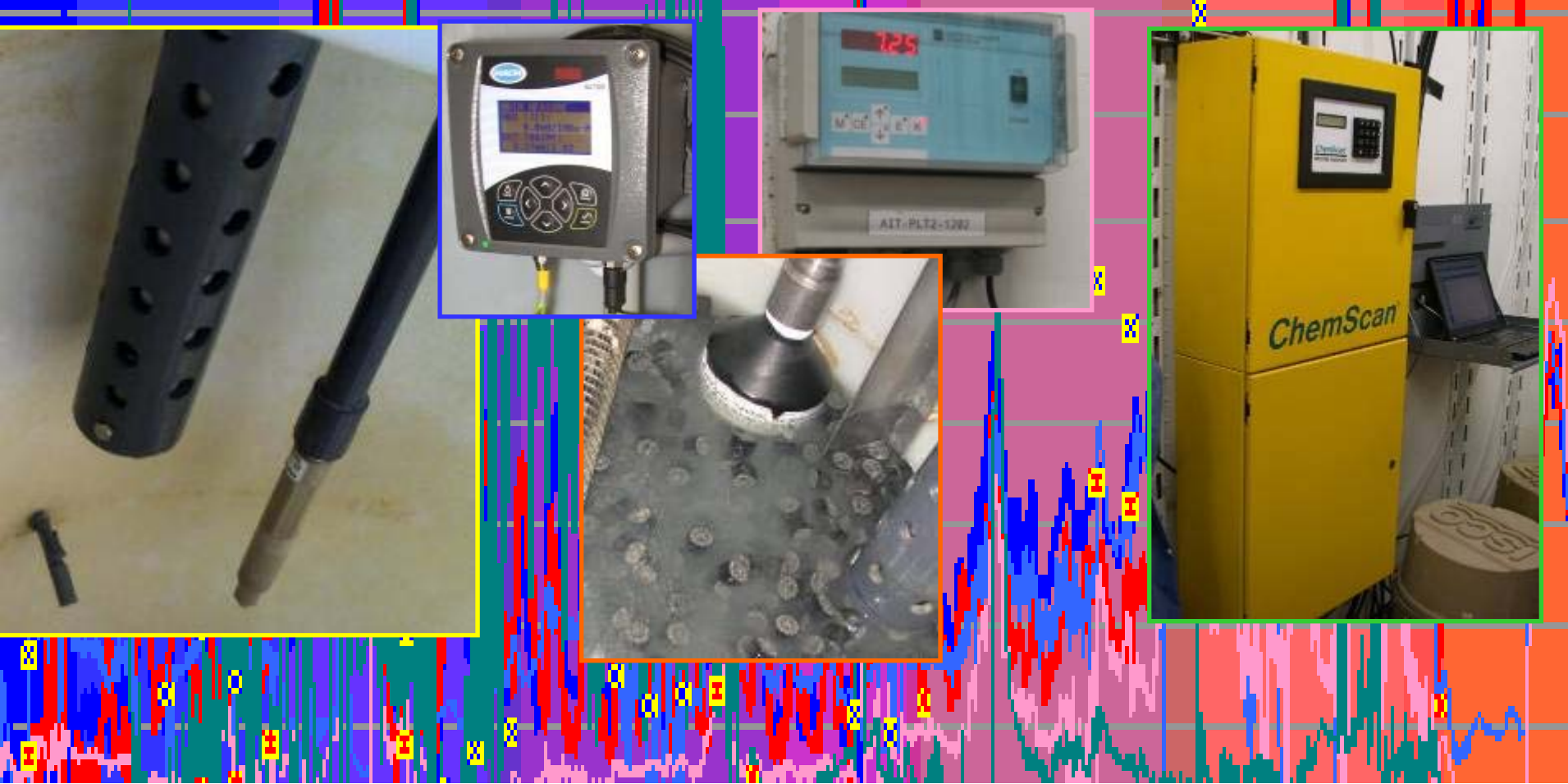




On-Line Analyzers: Reliable at Low Nutrient Concentrations?



Dilli Neupane METCALF & EDDY | AECOM

On-Line Analyzer Workshop – September 15, 2008

- ✚ Post-Denitrification MBBR
- ✚ Analyzers installed in tertiary wastewater with low solids
- ✚ Analyzer values checked against daily labs
- ✚ Periodic re-calibration required to maintain data integrity





Hach:

- Nitratax SC Plus, 2 mm path length
- NO_x



ChemScan:

- UV 6101
- NO_x, NO₂, NH₃ & OP



Endress+Hauser:

- Stamosens CNS 70-A5D1A
- NO_x

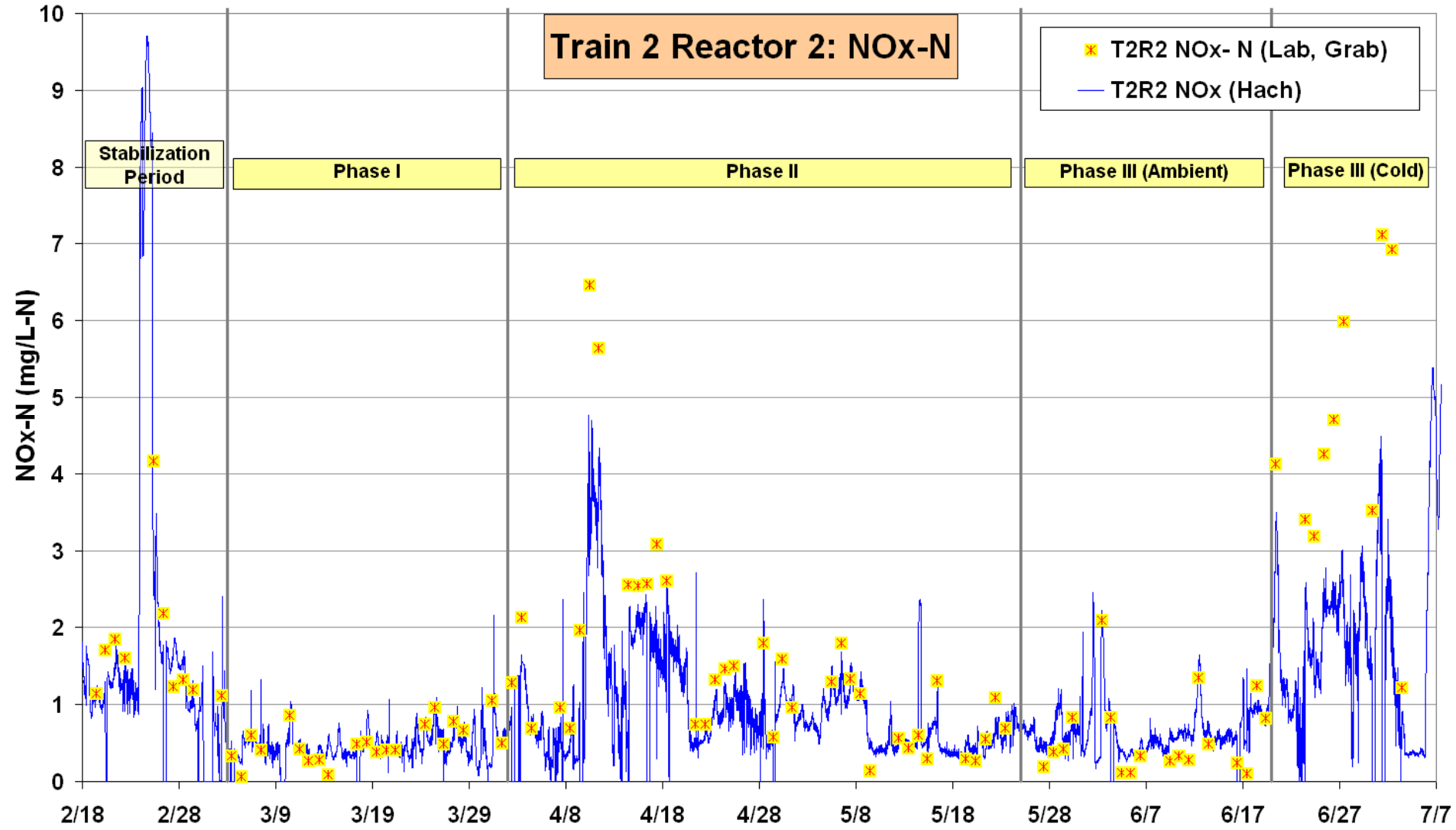


On-Line Analyzer Issues

- Accuracy
- Repeatability
- Maintenance

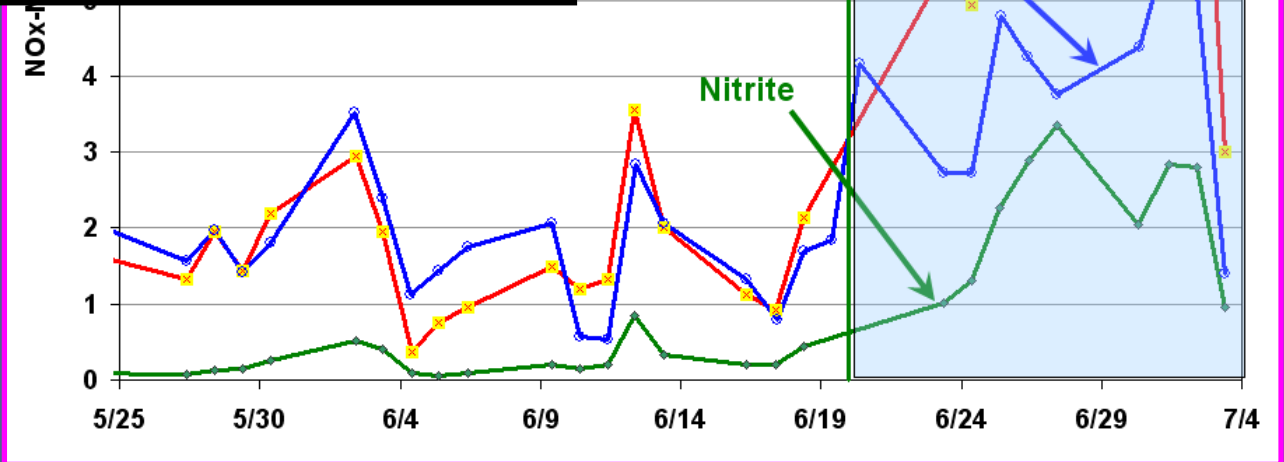
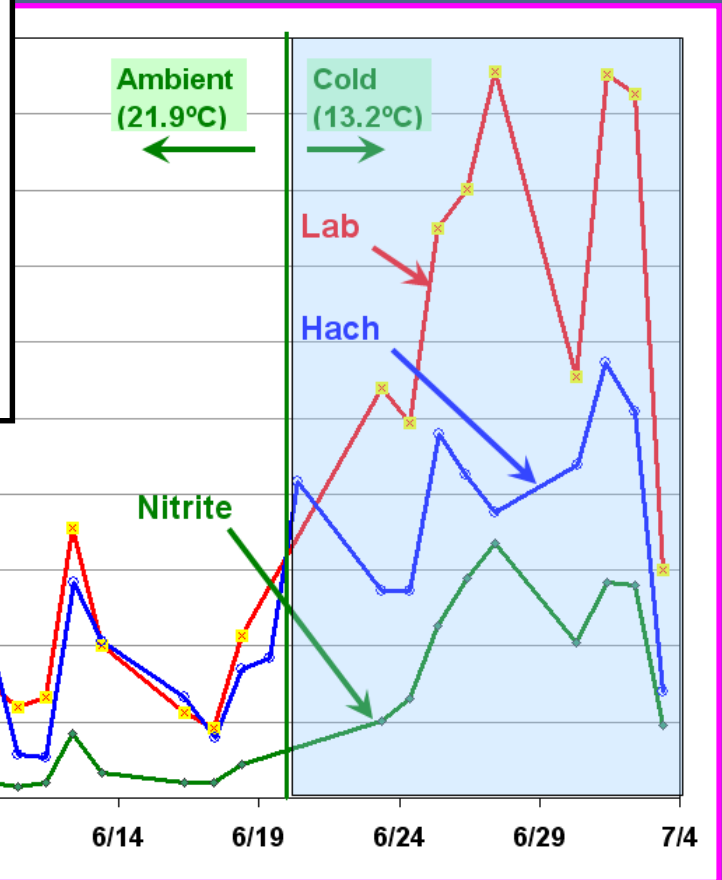
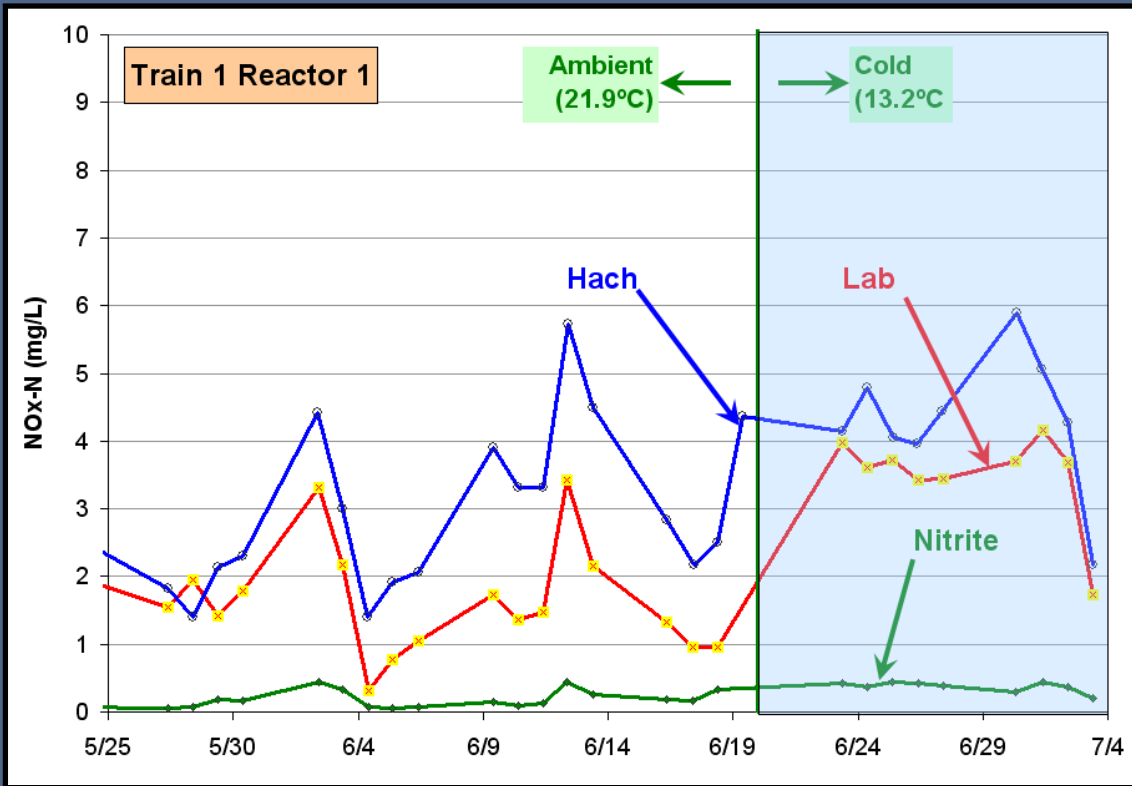


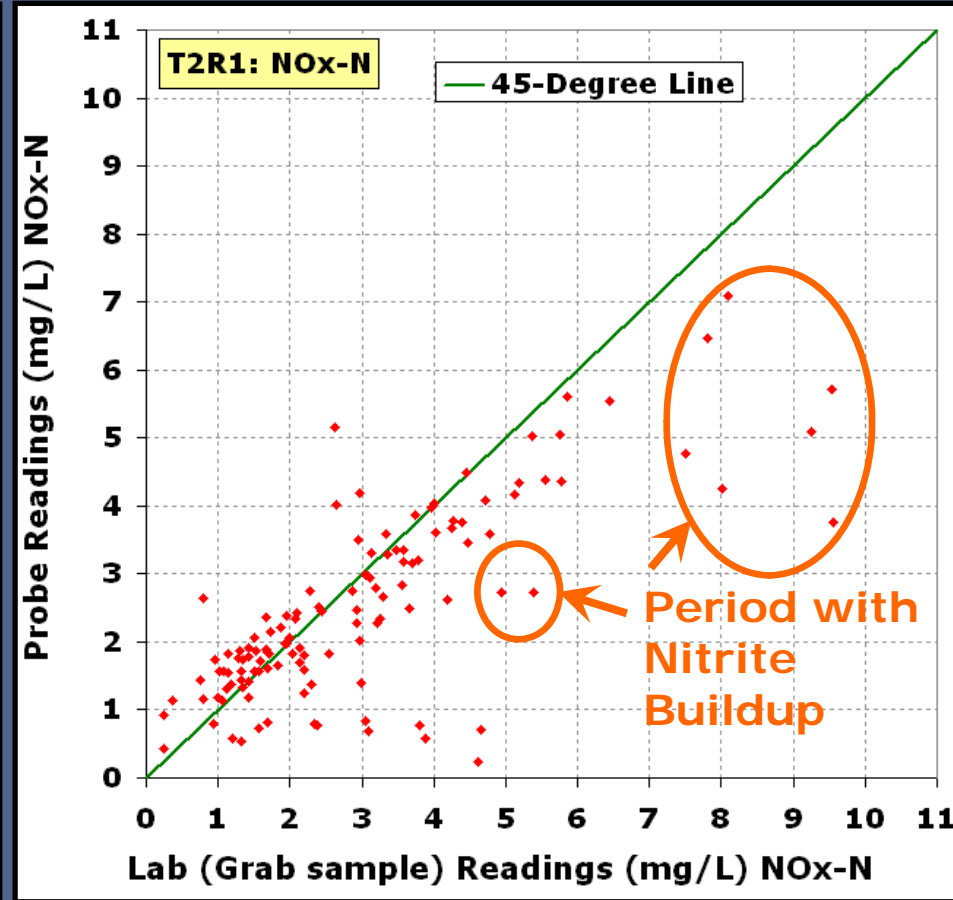
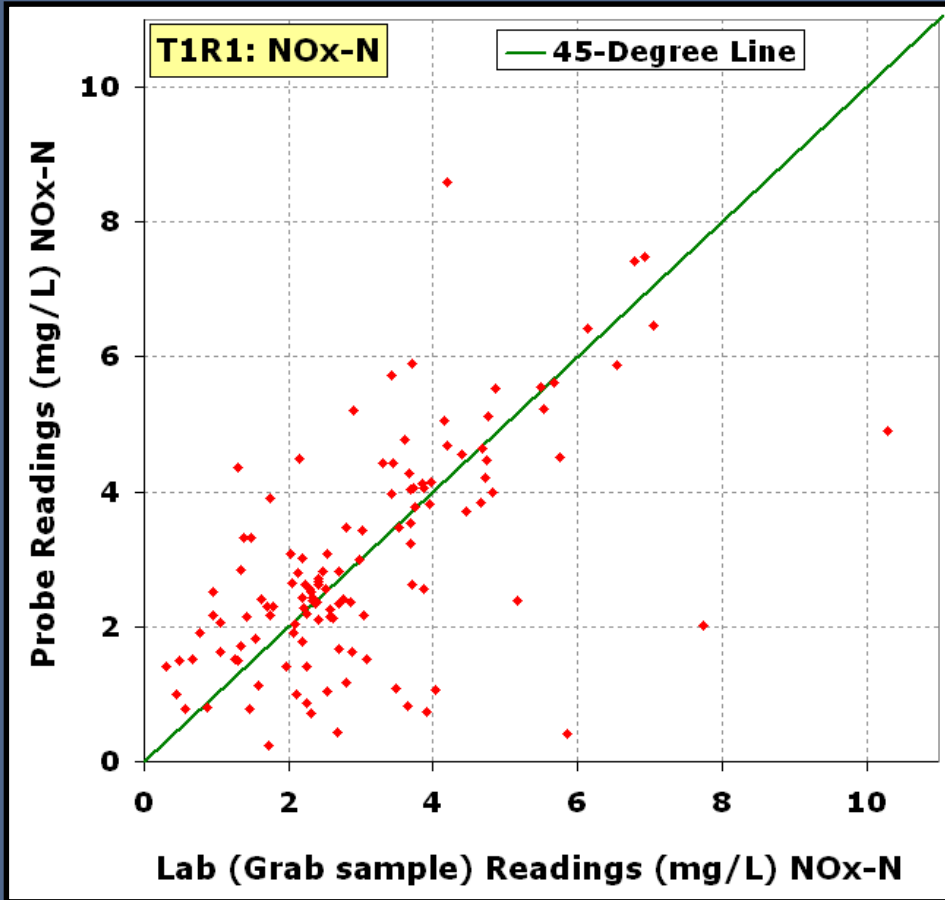
Hach: NO_x-N Probe vs Grab Samples

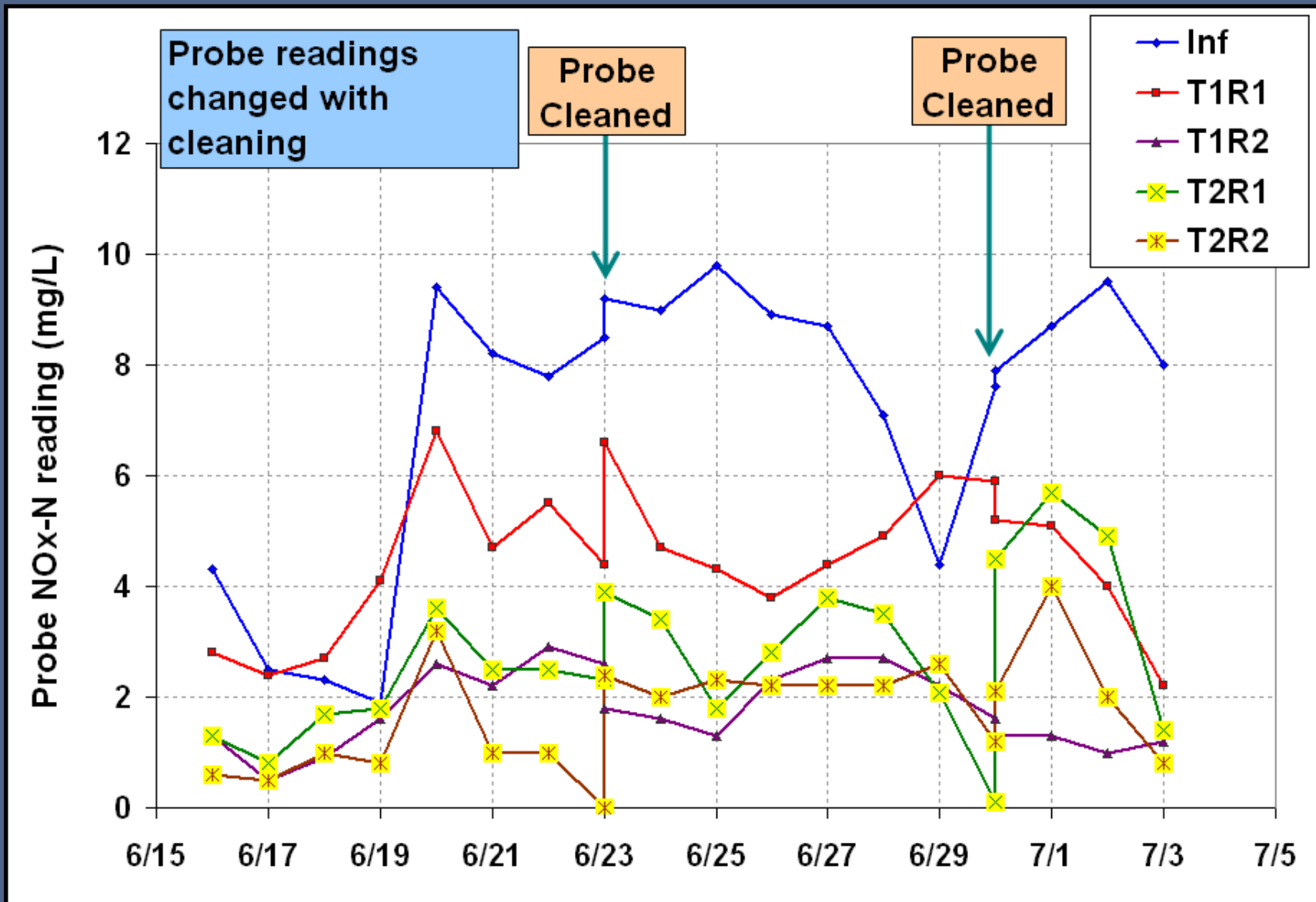


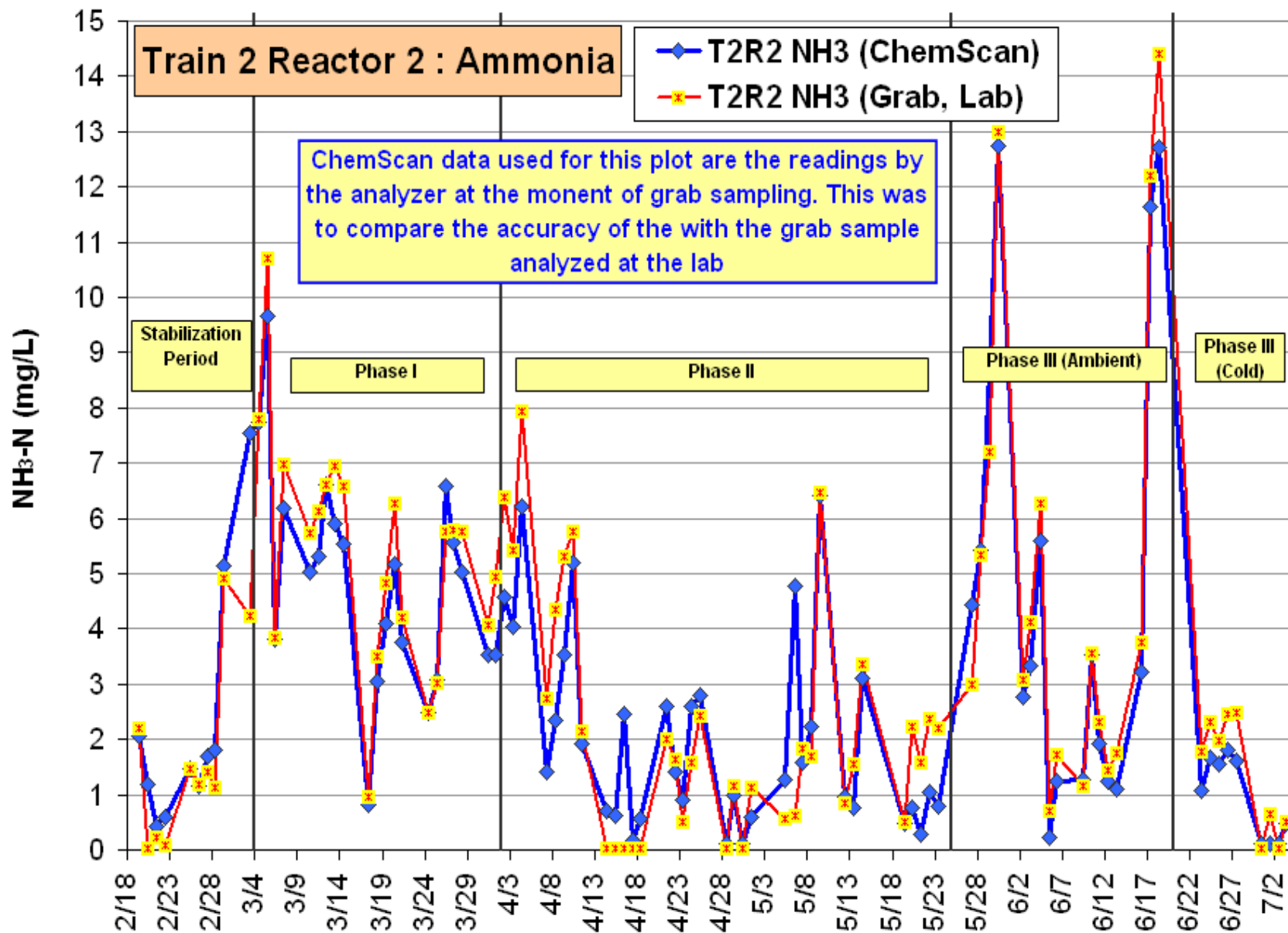


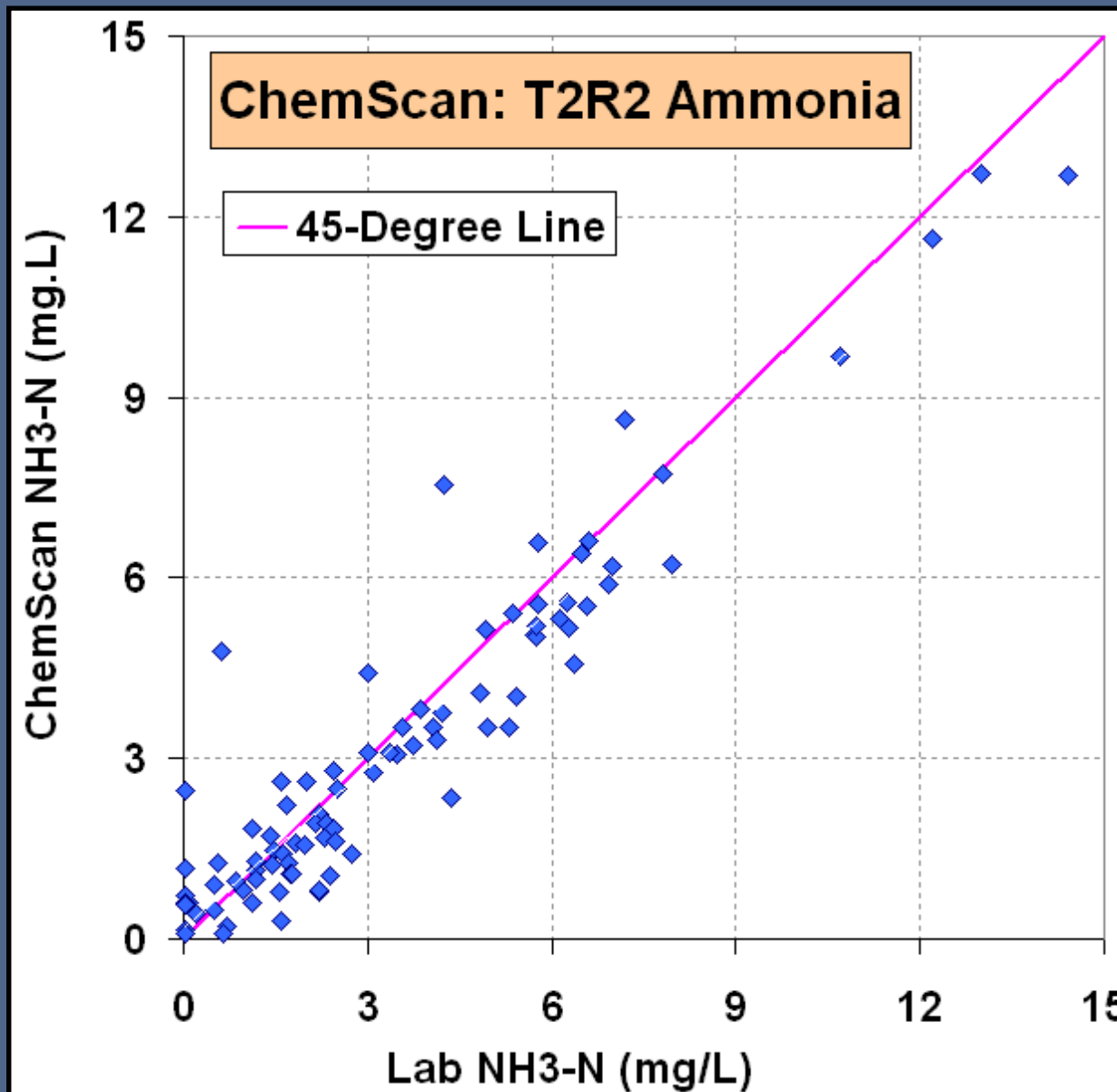
Hach: Impact of Nitrite Accumulation





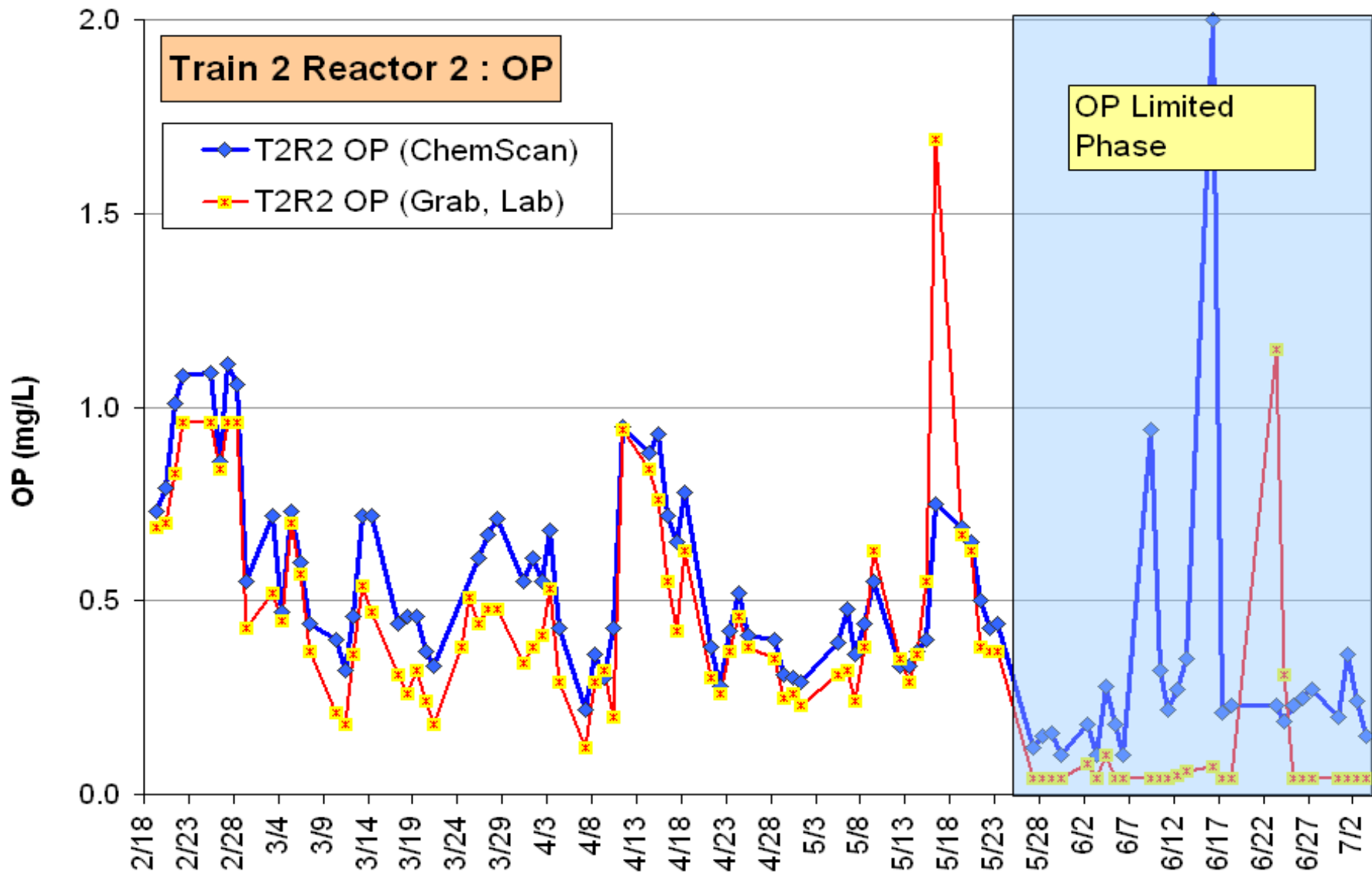


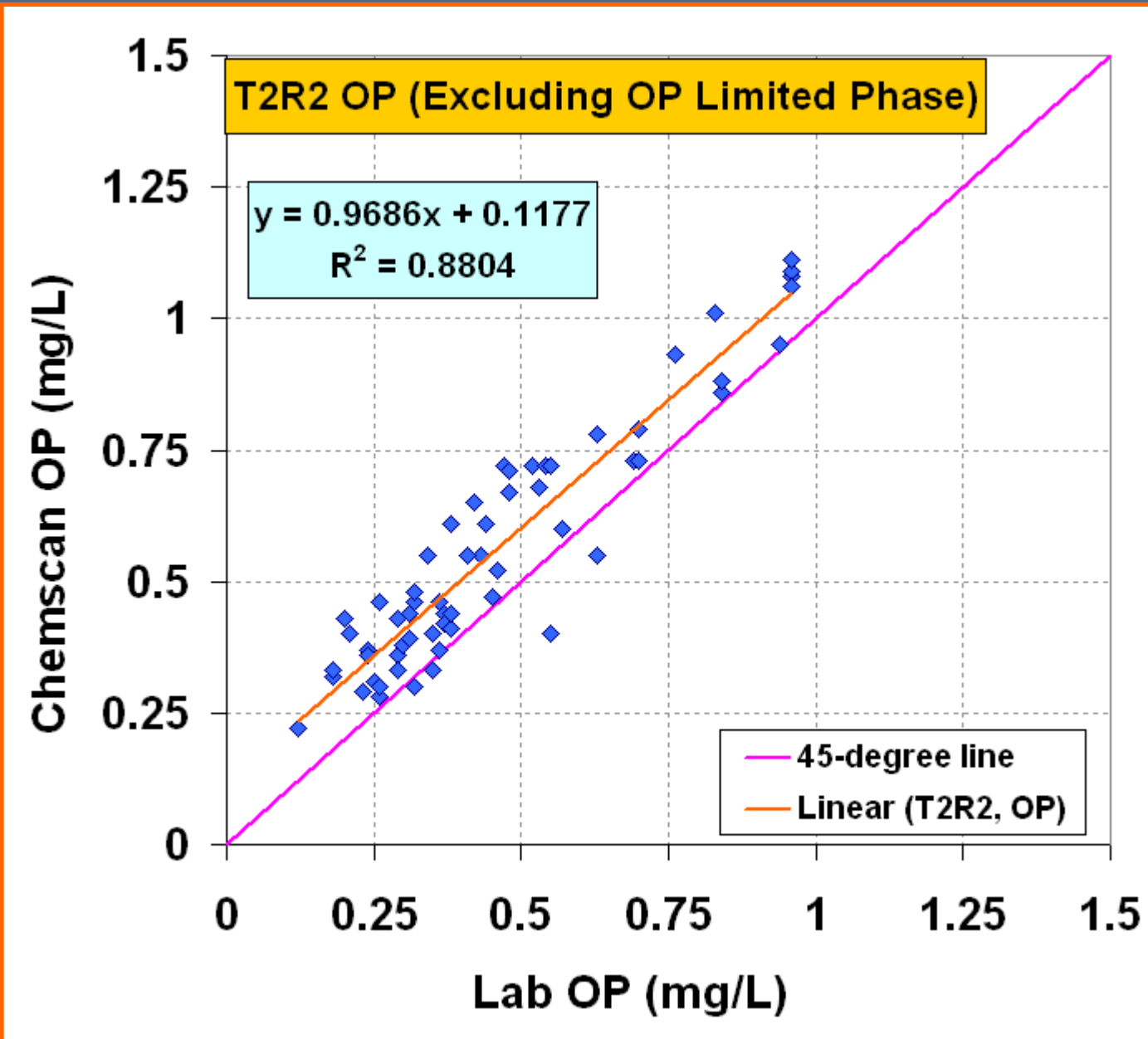


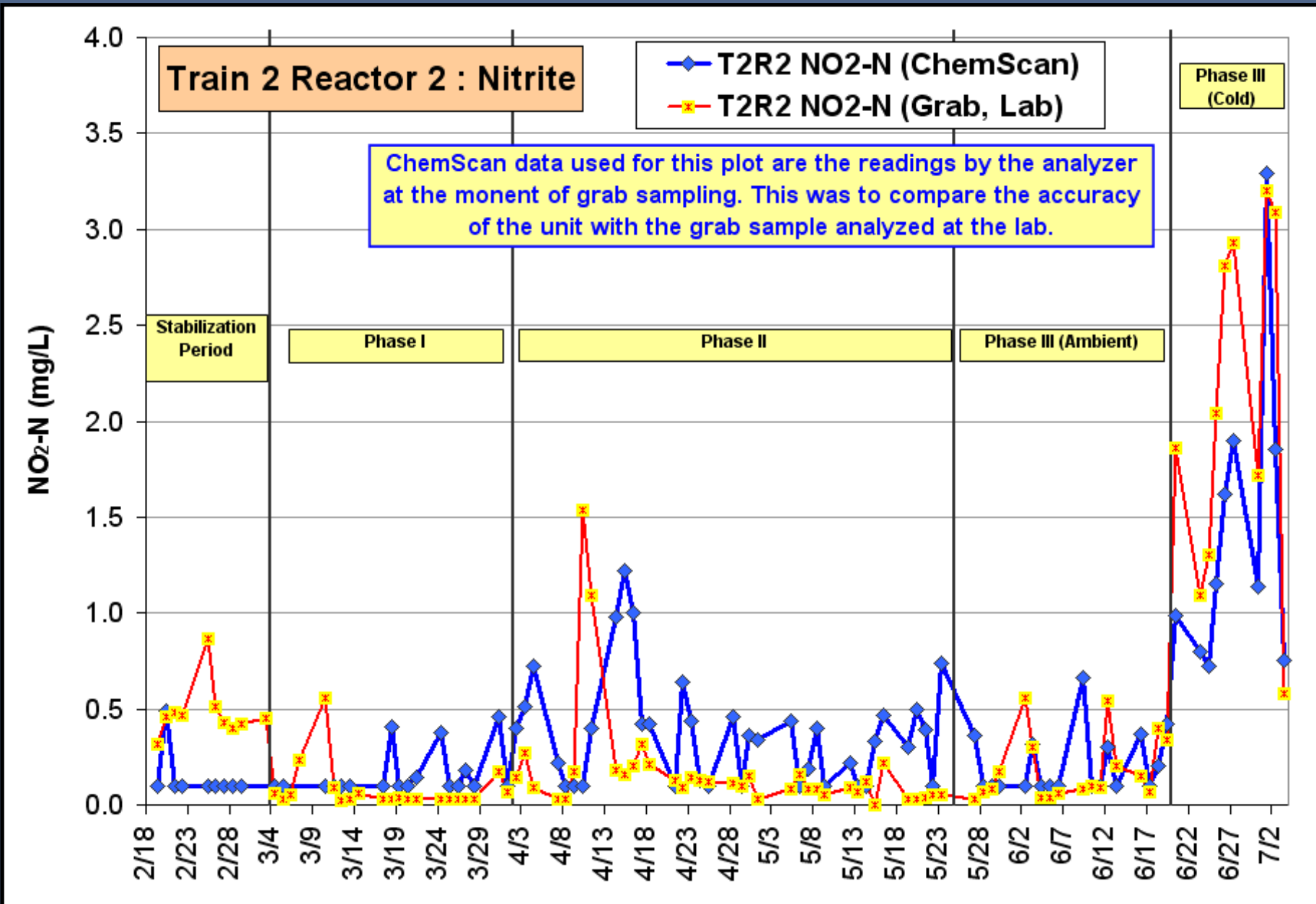


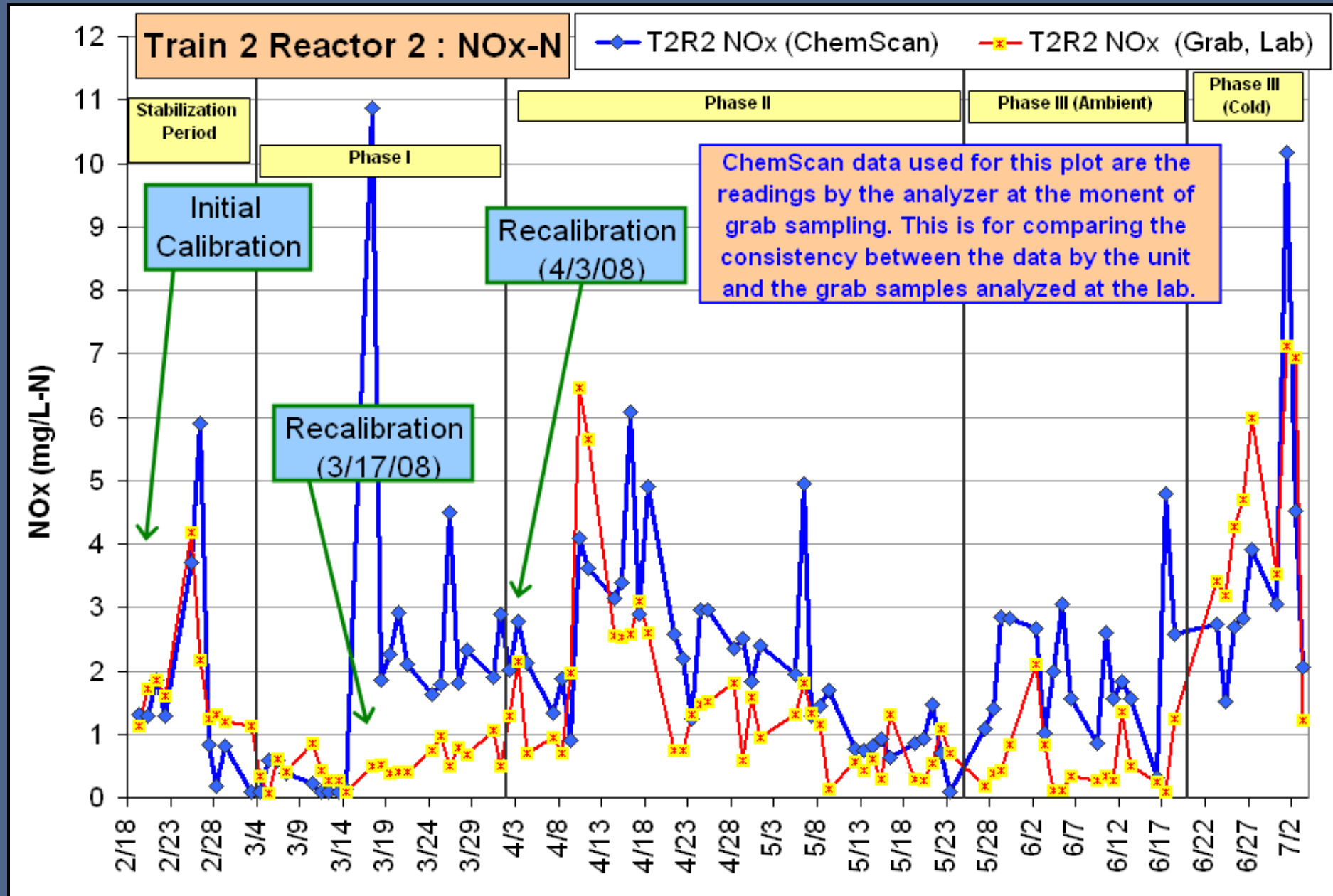


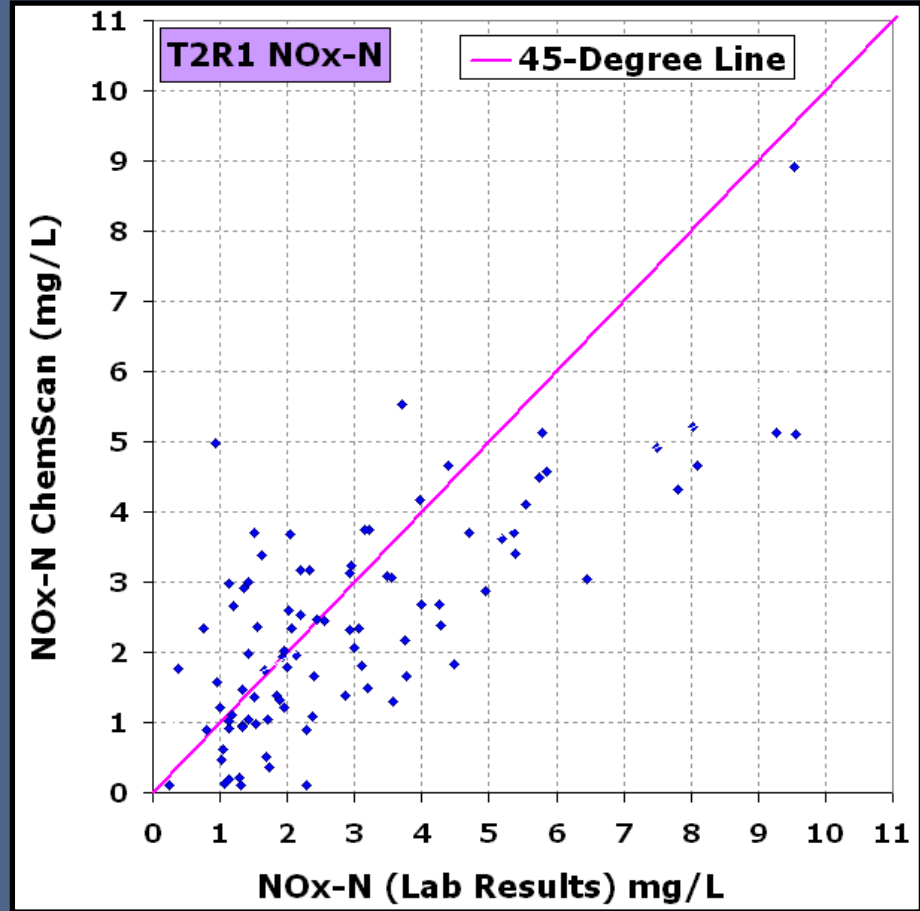
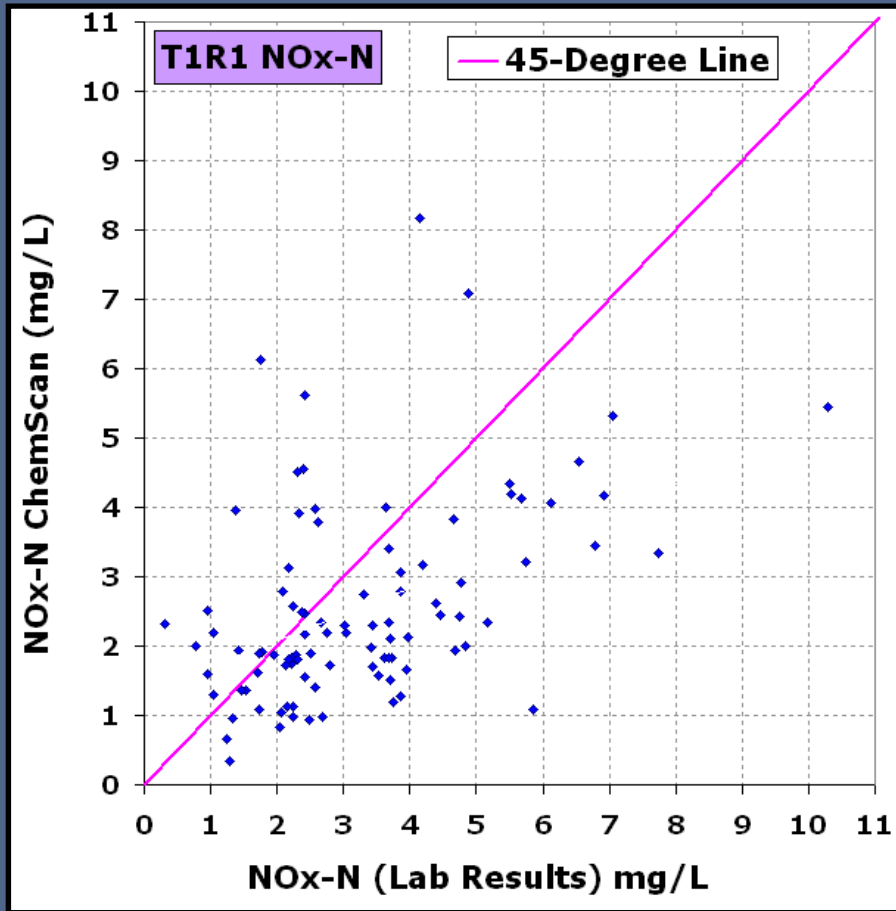
ChemScan Analyzer: OP

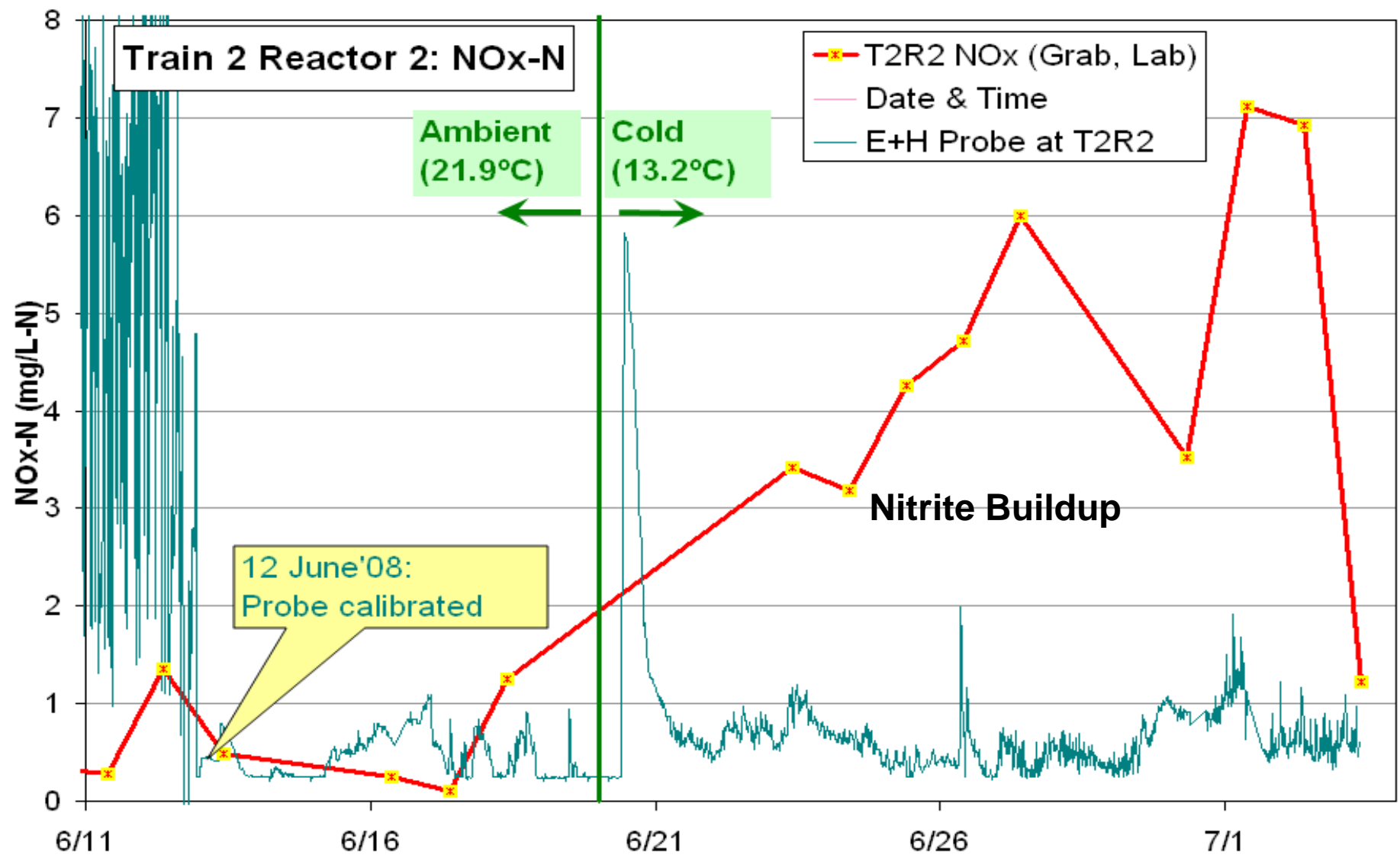


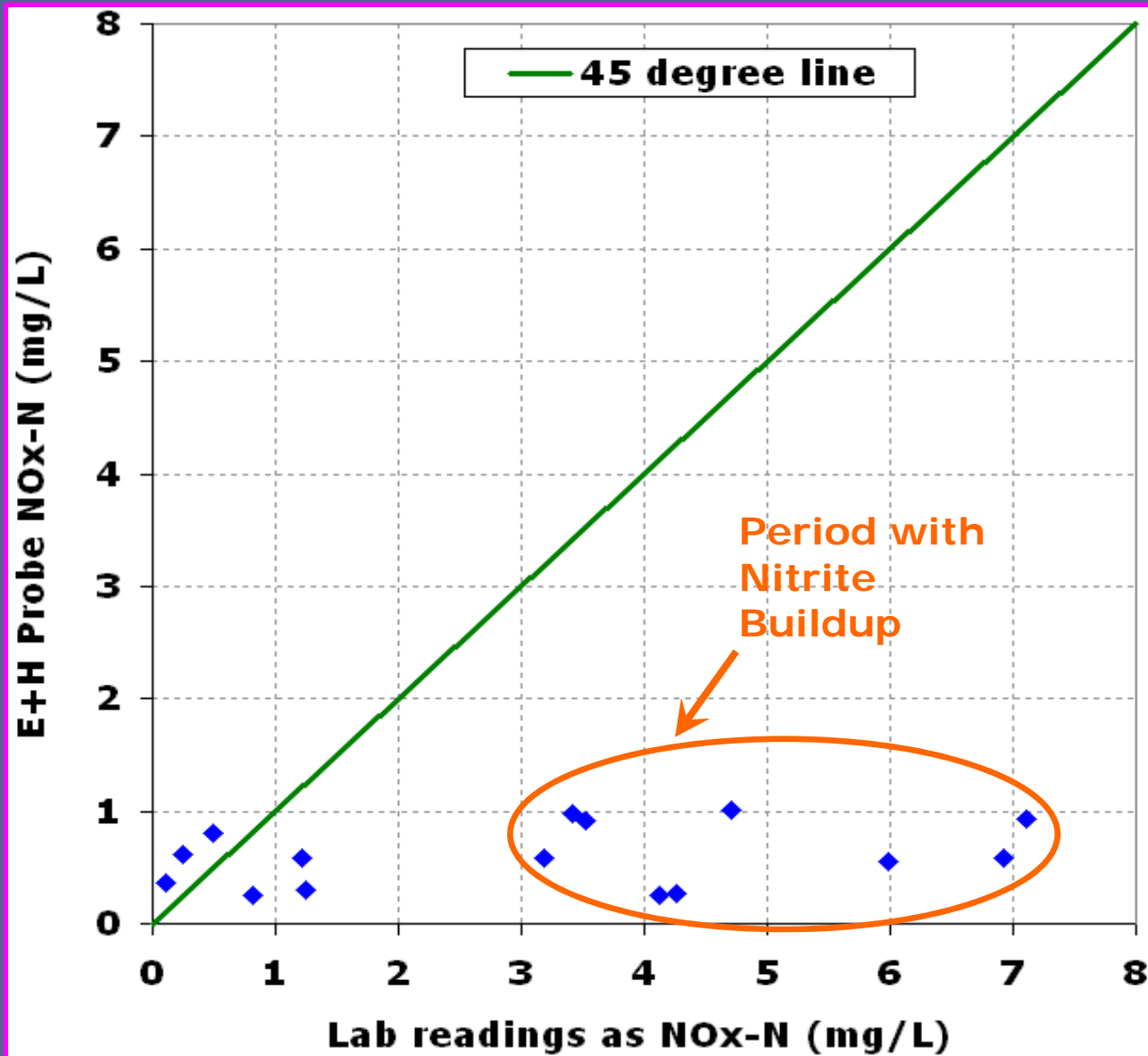












Conclusions



Accuracy

- Lost in the presence of NO_2
- Valid only within the calibration range



Repeatability

- Not repeatable for high accuracy application



Maintenance

- Periodic maintenance required
- Sample matrix will increase maintenance

Hach

- Required frequent cleaning to maintain accuracy. False low readings prior to cleaning.
- Periodic (2-3 months) recalibration required to maintain accuracy.

ChemScan

- Accurate for NH_3 and OP (in the calibrated range).
- Drifted periodically and needed recalibration
- Needs re-calibration on multiple parameters simultaneously

Endress+Hauser

- Affected by NO_2 as were other UV based analyzers
- No adequate data for thorough evaluation.

