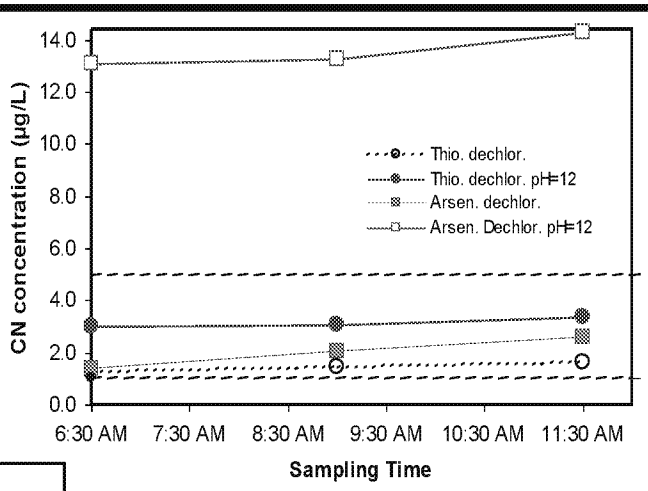
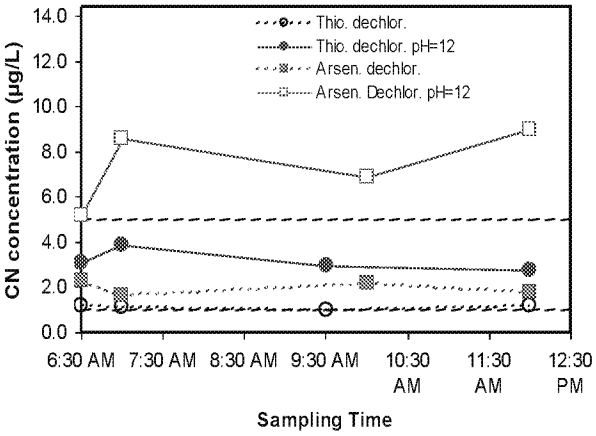
Valencia
Averaged Results

and

Saugus
Averaged Results





All samples analyzed immediately

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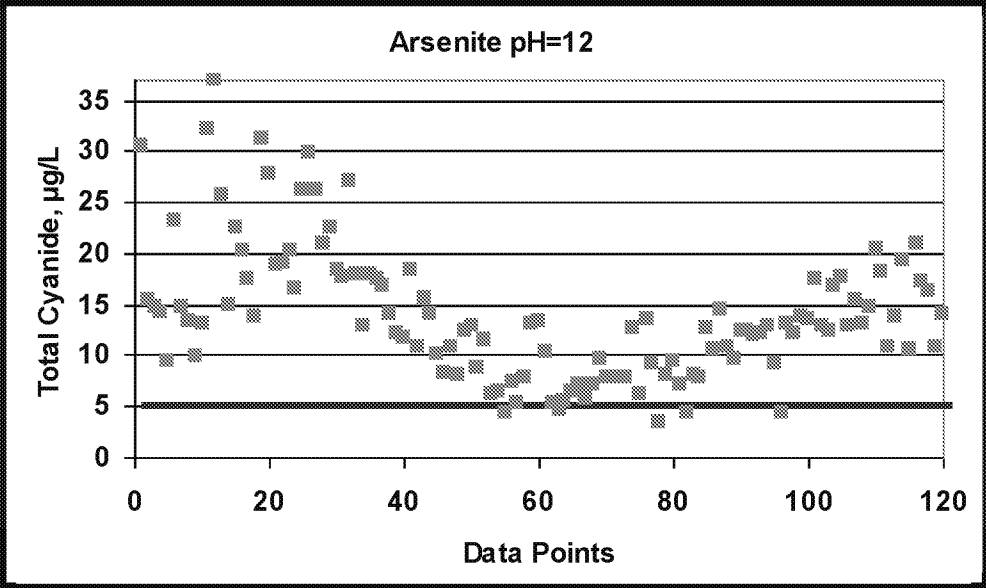
Four Preservation Protocols



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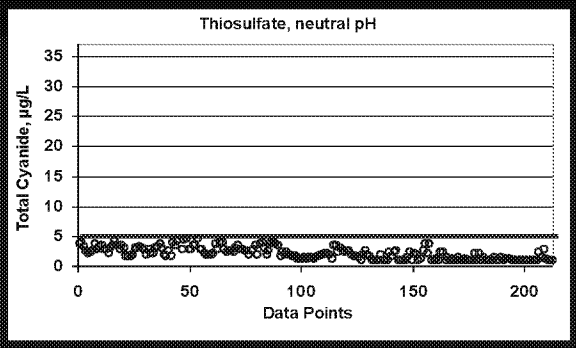
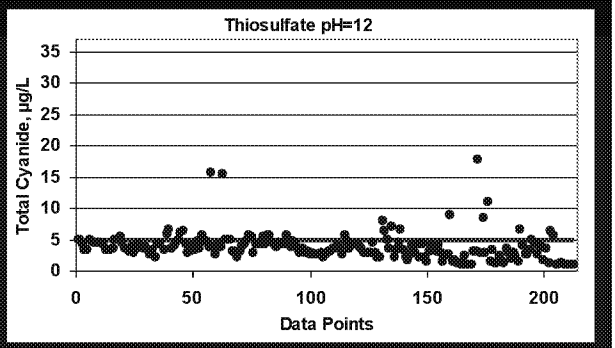
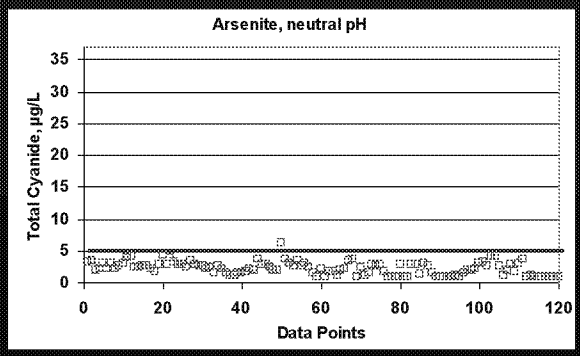
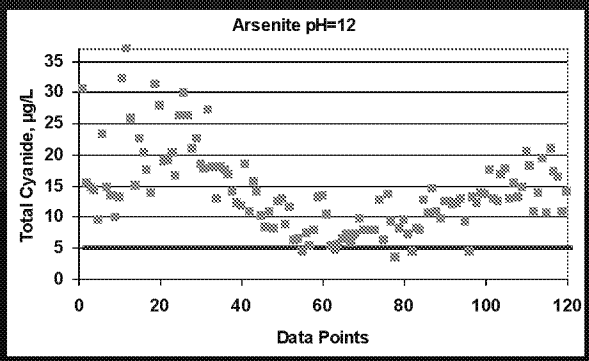
Four Preservation Protocols









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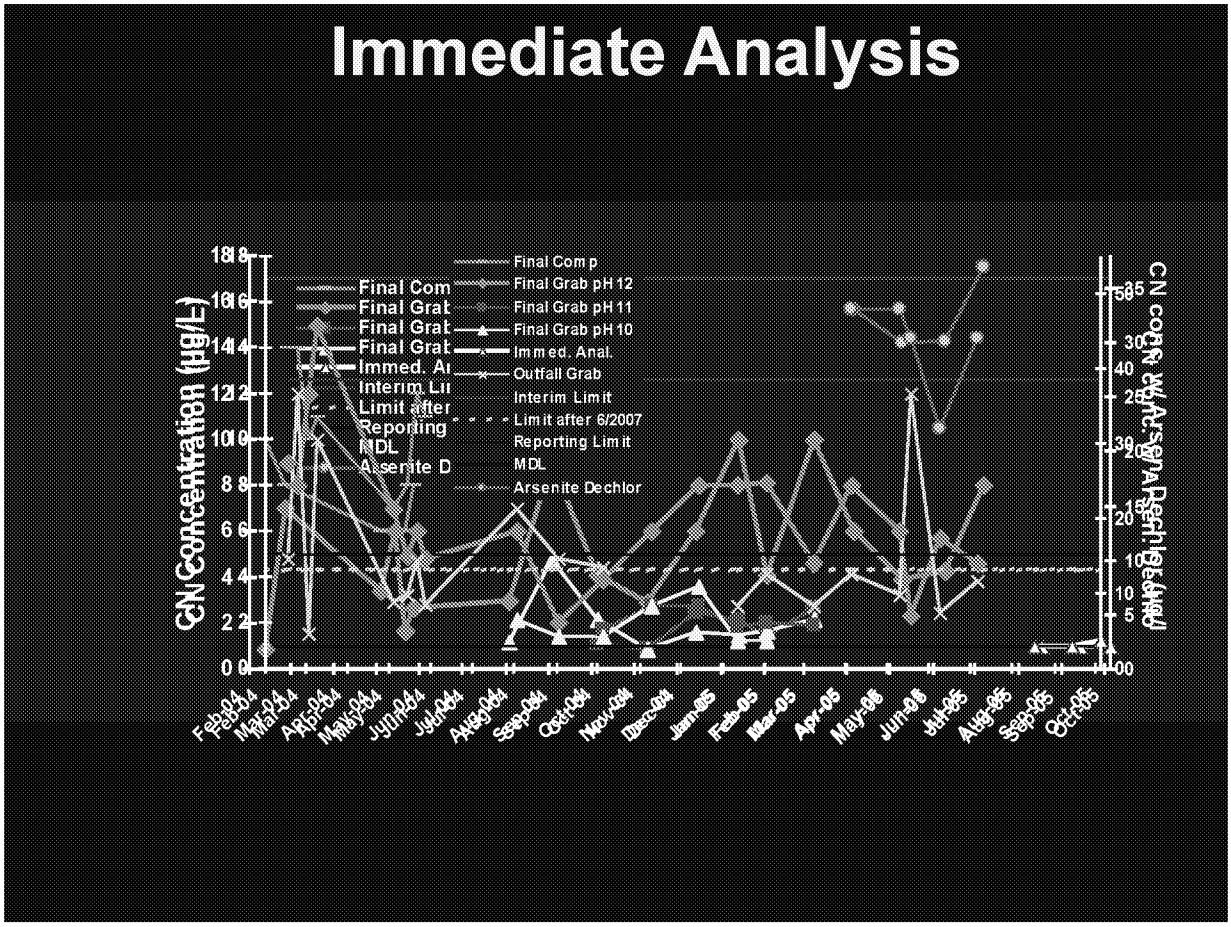
Summary

- Approved methods for total CN analysis give conflicting results.
- Final effluent CN level < 5 µg/L reporting limit.
- High CN level generated in samples that were dechlorinated and preserved at high pH.
- Amount of CN generated increases with pH.
- Some dechlorinating agents magnify the effect.
- **Immediate analysis** of cyanide without addition of NaOH is preferable.



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Ongoing Studies:

- Identify the matrix precursor(s)
- Propose chemical reaction pathways
- Assess other methods
- Lower our reporting limits

Credits

- Pearl Ang-Tiu, Pamela Brey, Emmanuel Akpu, Peter Corral
- Connie Young, Anita Pandit, Jorge Garcia, Joseph Khoury
- Maria Pang, Steve Carr, Chris Wissman, Keith Magers, and Dwayne Fischer

Contact

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Whittier CA 90601

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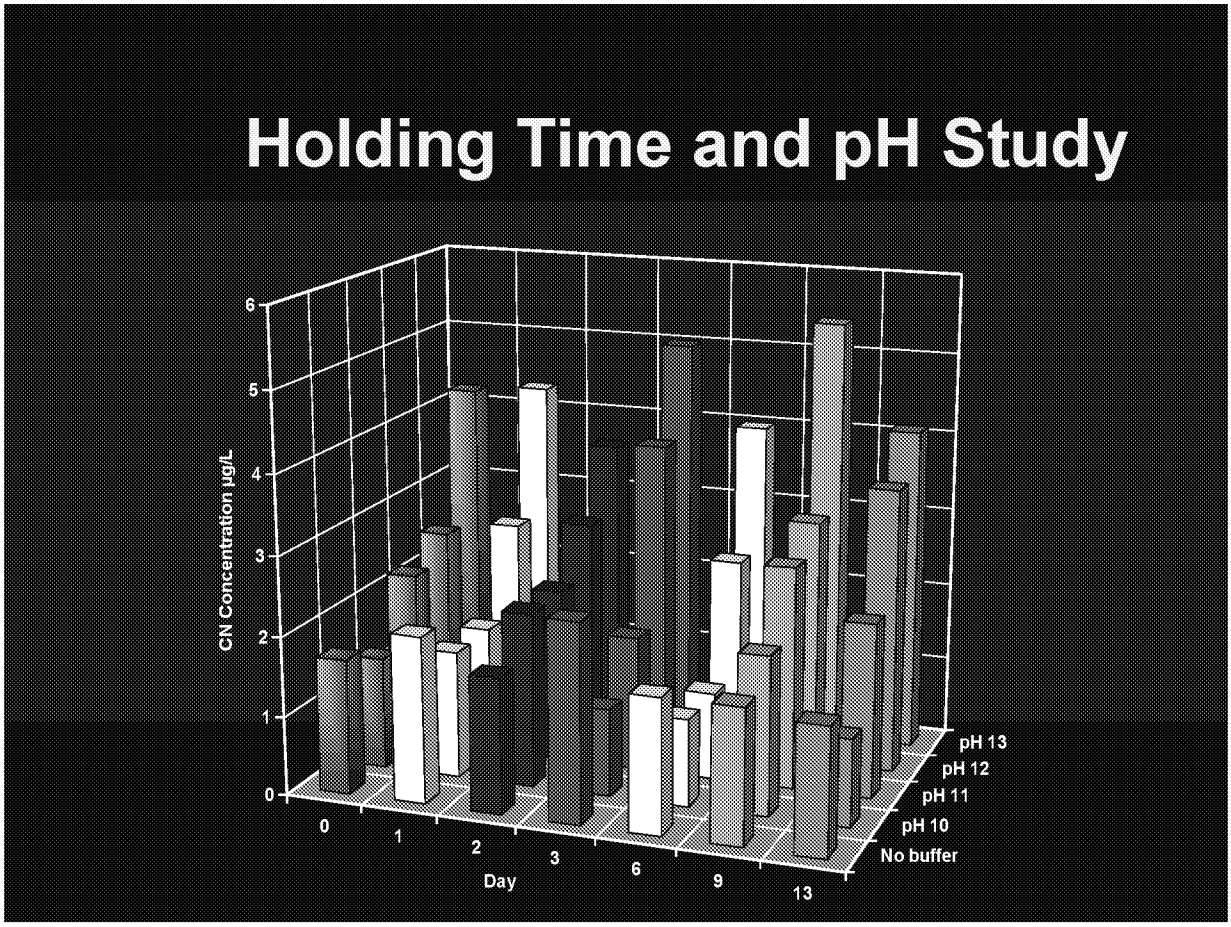
Steve Carr,	Lab Supervisor	scarr@LACSD.org
Joseph Khoury,	Chemist	jkhoury@LACSD.org



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Calculated Loss of HCN

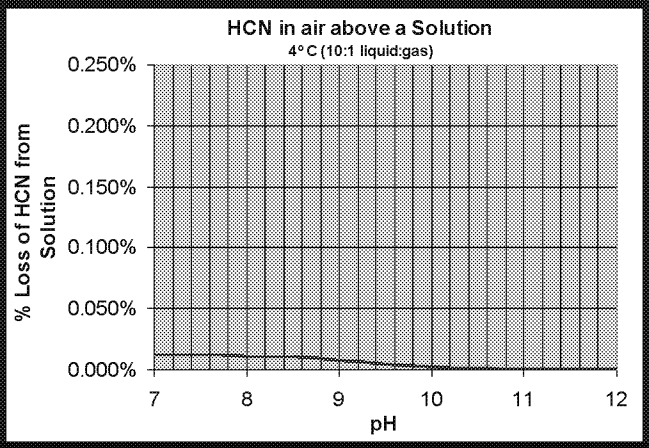
U.S. Environmental Protection Agency (2000) *Managing Cyanide in Metal Finishing*; EPA 625/R-99/009, section 4.0; Cincinnati, Ohio

"…cyanide air emissions can be estimated on the basis of equilibrium levels of cyanide in the air over solutions at various temperature and pH values from the following:"

$$[HCN]_{air} = [(1470/T)e^{(9.275-2992/T)}]/[1+10(pH-9.3)]$$

Where HCN = mg HCN/m3 air per ppm NaCN in solution, and T = temperature, Kelvin

Calculated Loss of HCN



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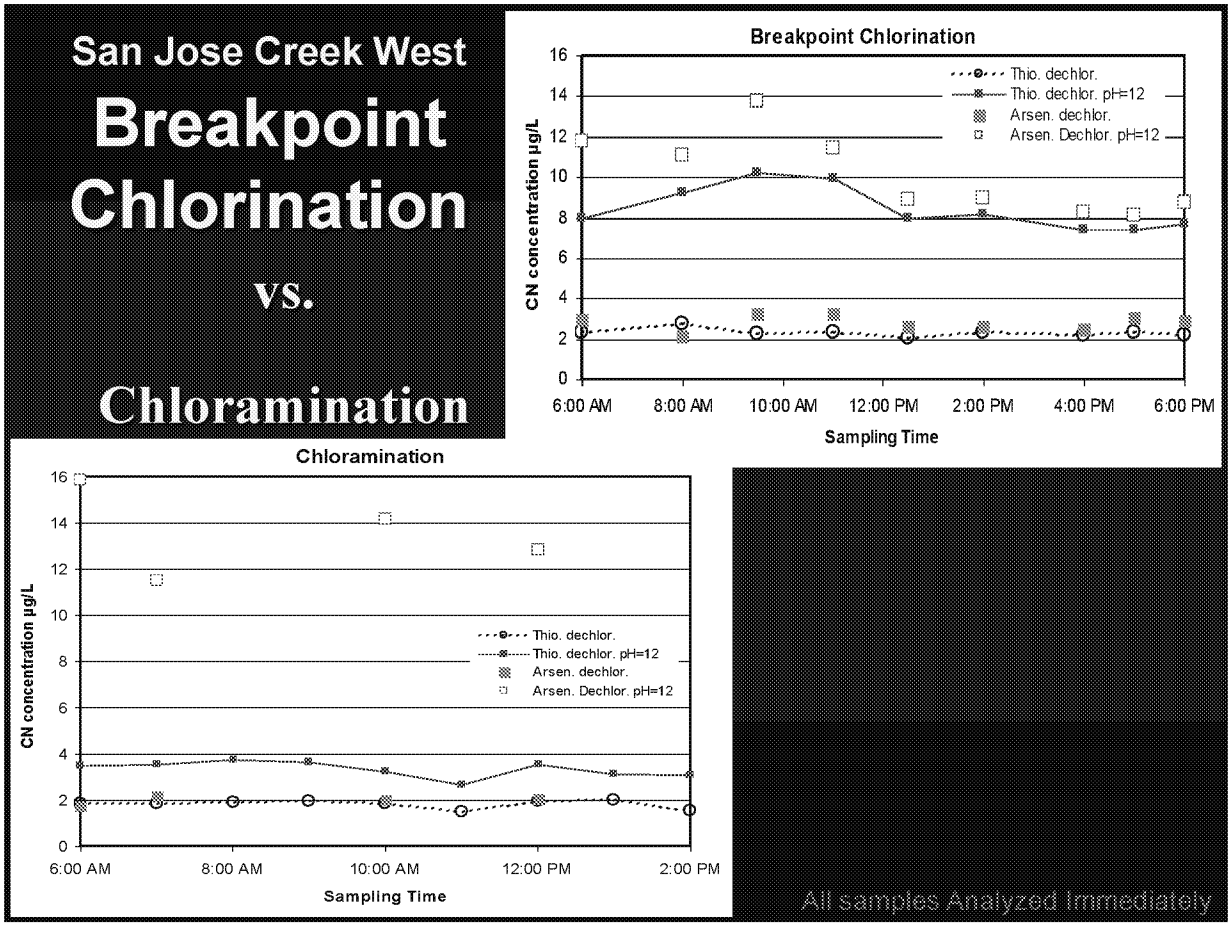

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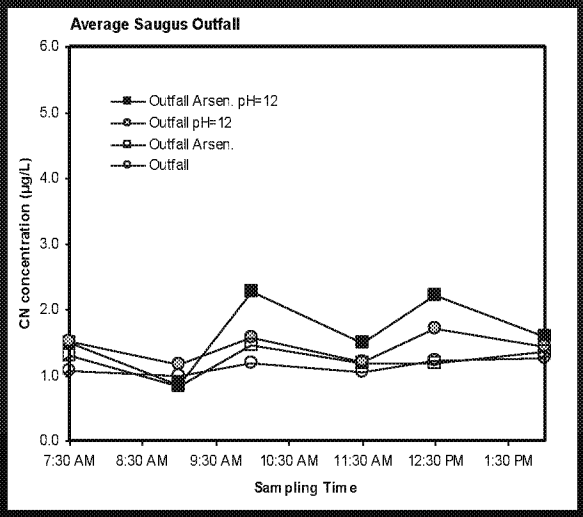
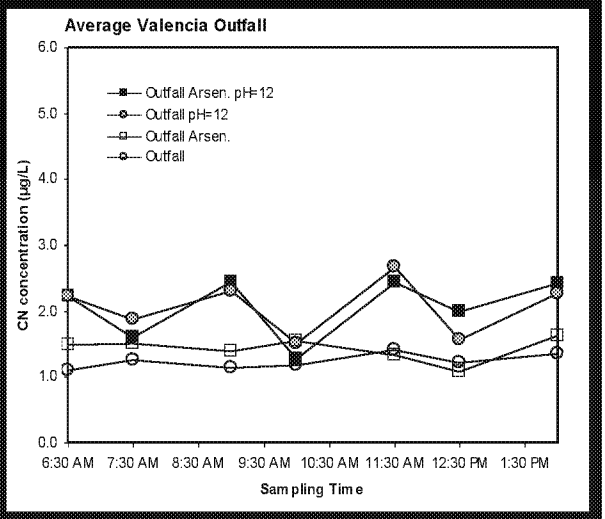
Outfall Studies

Saugus & Valencia





All samples Analyzed immediately

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Arsenite Reaction Studies

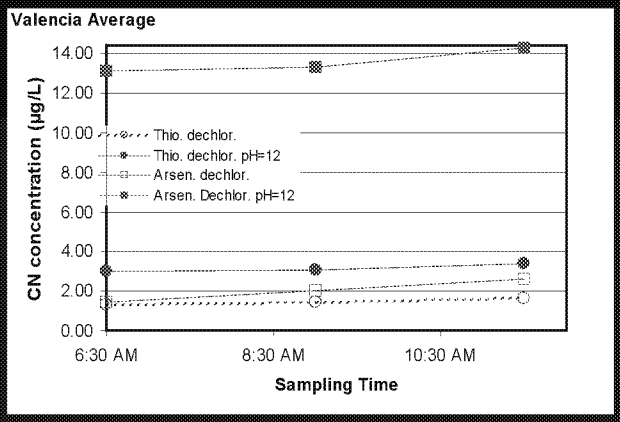
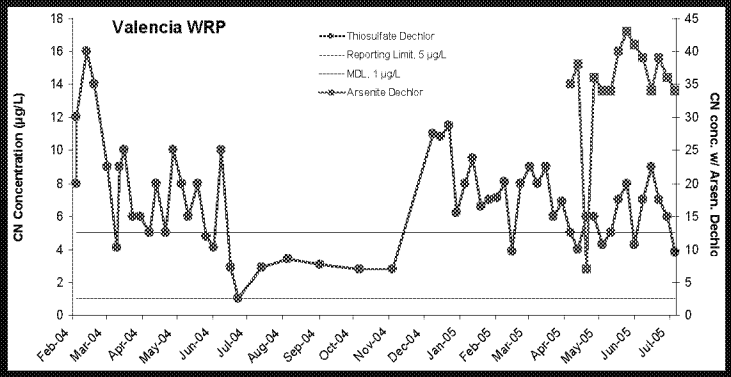
Matrix Precursor + Chlorine → Precursor, Chlorine, Arsenite intermediates? → Precursor, Chlorine, Arsenite at high pH → Analyze

Timing between

- ✓ Sample collection and Dechlorination
- ✓ Dechlorination and NaOH addition
- ✓ NaOH addition and Analysis

Immediate Analysis vs. Preserved Samples

Immediate analysis



A few days between preservation and analysis