Case Study – Pinehurst Hotel Cleaners

- Laundry & dry-cleaning facility for former Pinehurst Hotel
- Operated 1930's through 1970's
- Contamination identified during due diligence assessment on adjacent property in 1990
- Property owner entered site into DSCA Program in 2001

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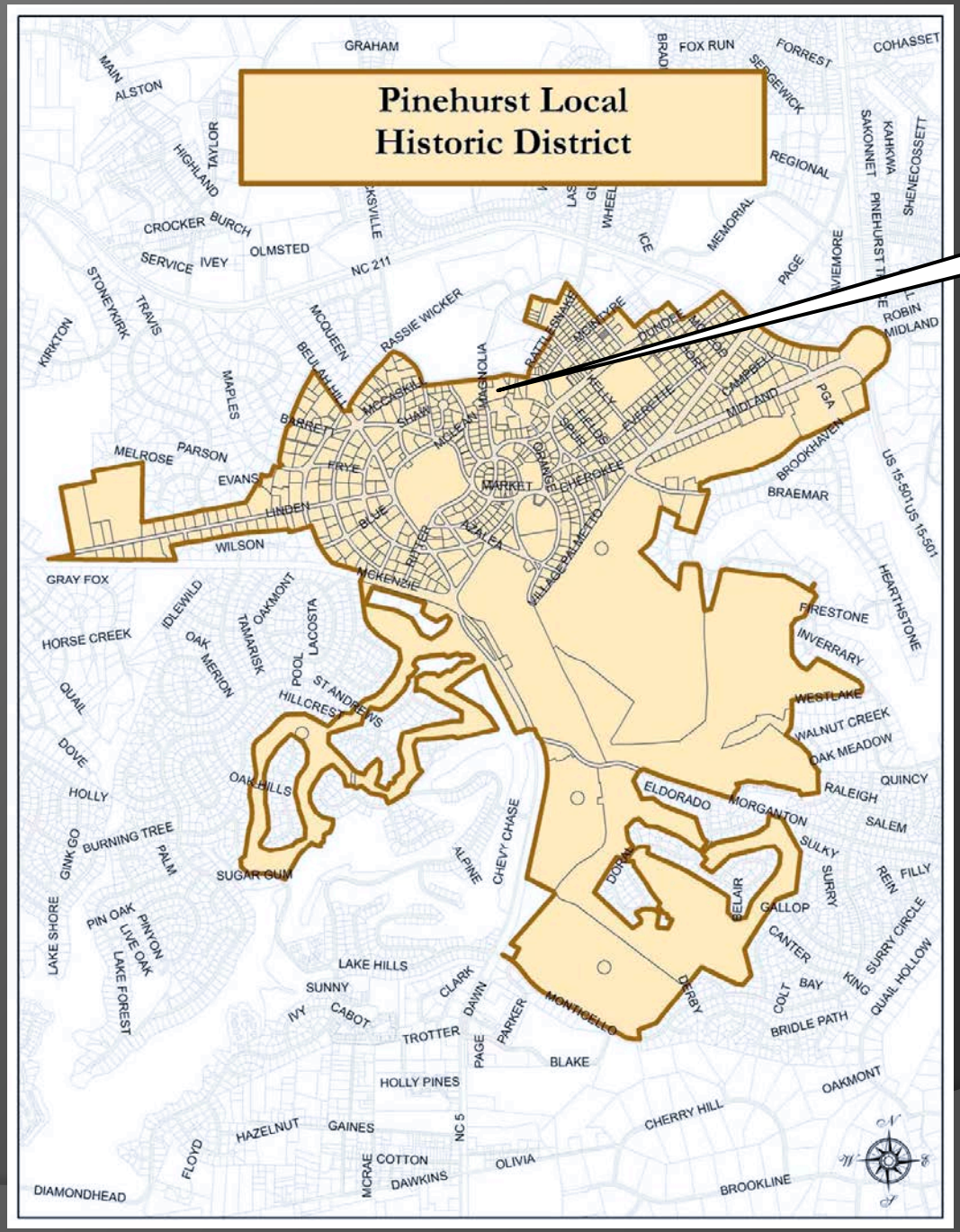
Site Map


VILLAGE OF PINEHURST PARK
Magnolia Road
UNDEVELOPED
COMMERCIAL/ INDUSTRIAL
Rattlesnake Road
McCaskill Road
COMMERCIAL
FORMER DRYCLEANER BUILDING
COMMERCIAL
SITE
RESIDENTIAL CONSTRUCTION



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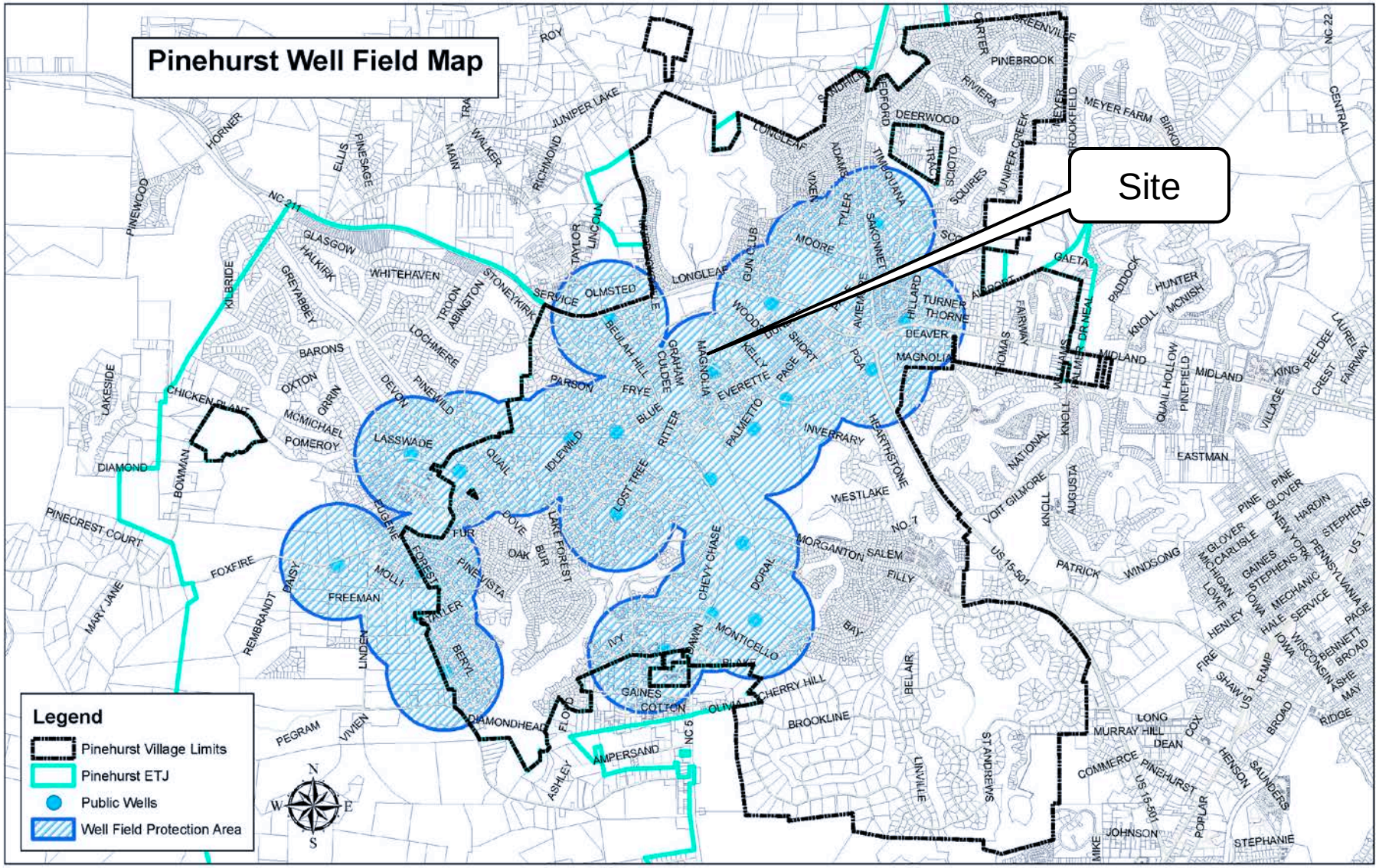

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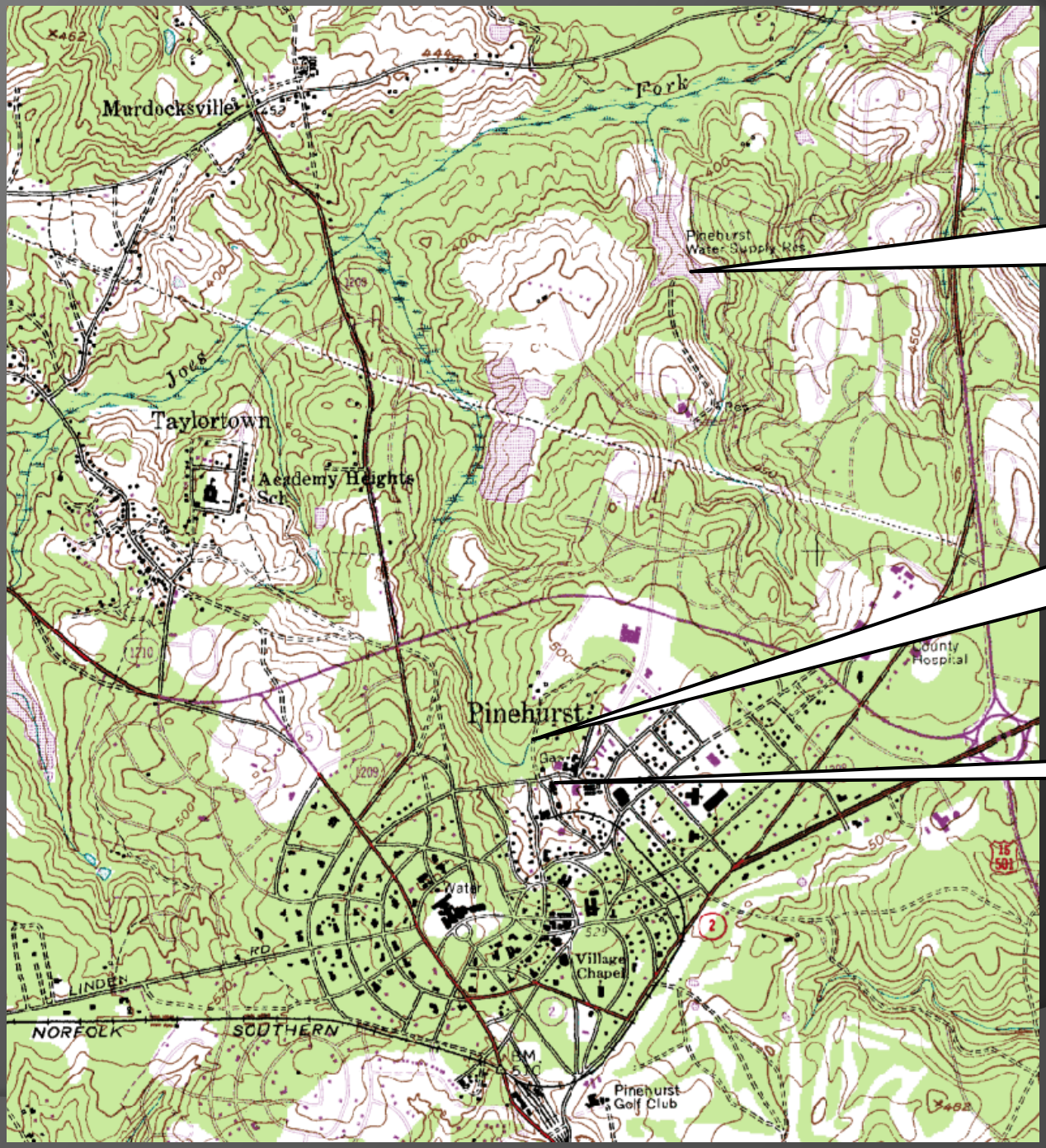

Pinehurst Water Supply Reservoir

Class WS-III Stream

Site

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PCE Plume in Soil

- Maximum PCE concentration: 180 ppm
- Impacted soil exposed at ground surface

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Groundwater Flow Direction

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PCE Plume in Groundwater

- Maximum PCE concentration in groundwater: 340 ug/L
- Maximum PCE concentration in surface water: 14 ug/L

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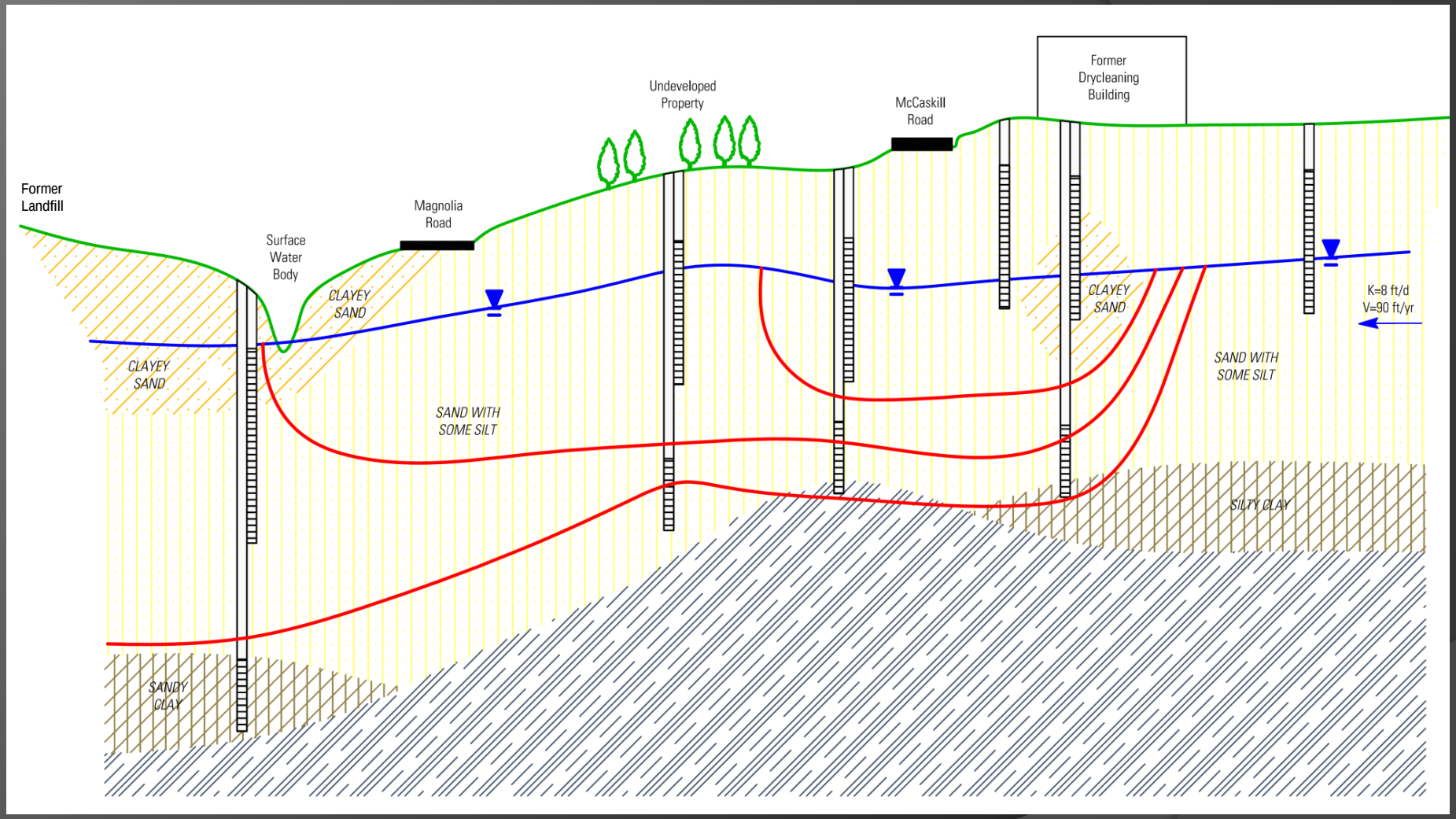
Geologic Cross-Section



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Risk Assessment

Based on risk assessment, remediation needed to address:

- **Surficial soil exposure**
- **Source soil and groundwater impacting surface water**

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Soil Remediation

- Excavated 750 tons

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Soil Remediation

- Treated on-site using mobile steam distillation unit

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Soil Remediation

- Compliance with Village of Pinehurst requests

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Groundwater Remediation

- Injection in source area
- Phytoremediation downgradient

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Chemical Injection

- Injection of ZVI, HRC, EHC, nutrients, and oxygen scavengers in source area
- Mulched surface to promote anaerobic activity

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Chemical Injection

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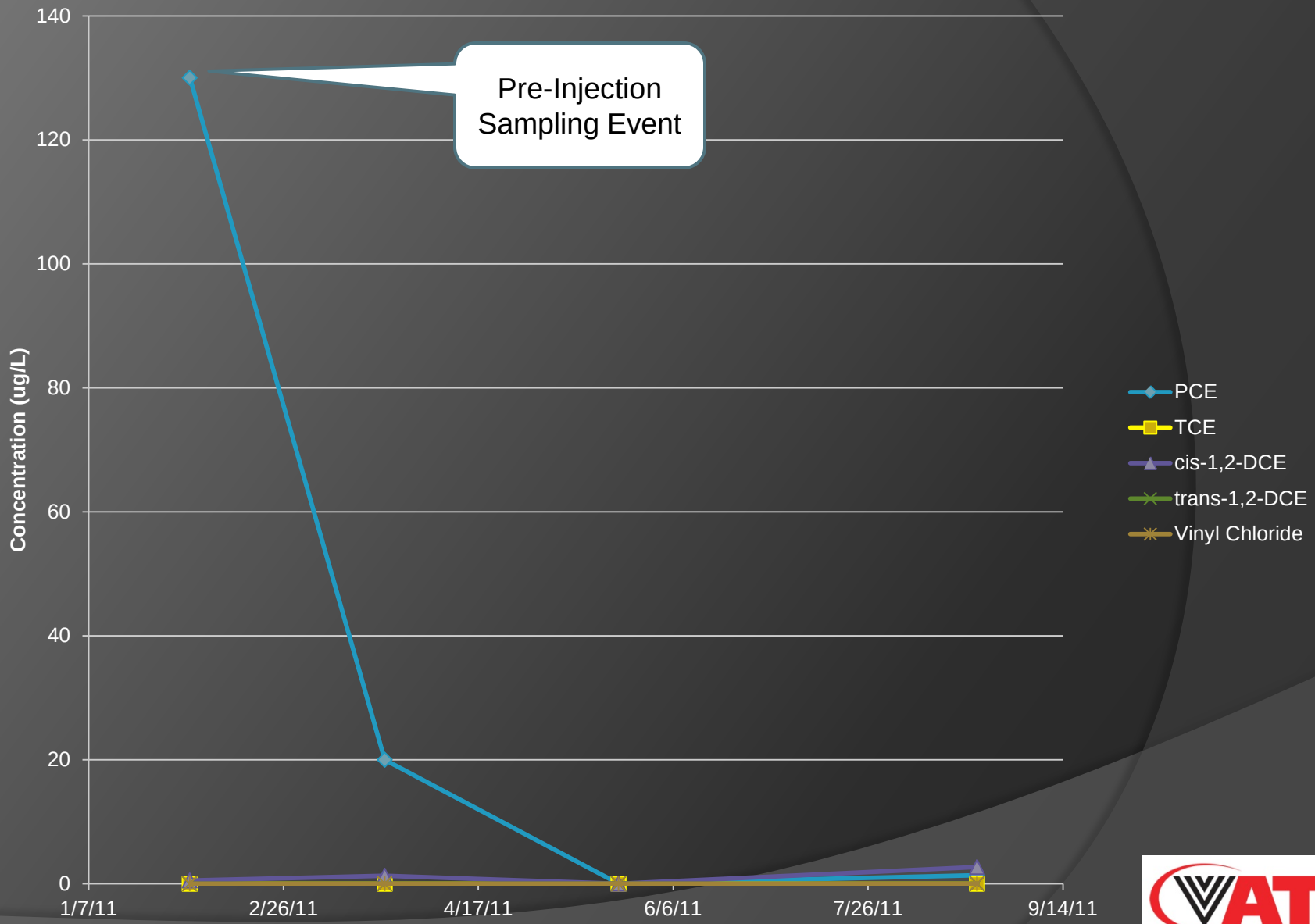
Concentration Vs Time in Injection Area



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Groundwater Remediation

- Injection in source area
- Phytoremediation downgradient

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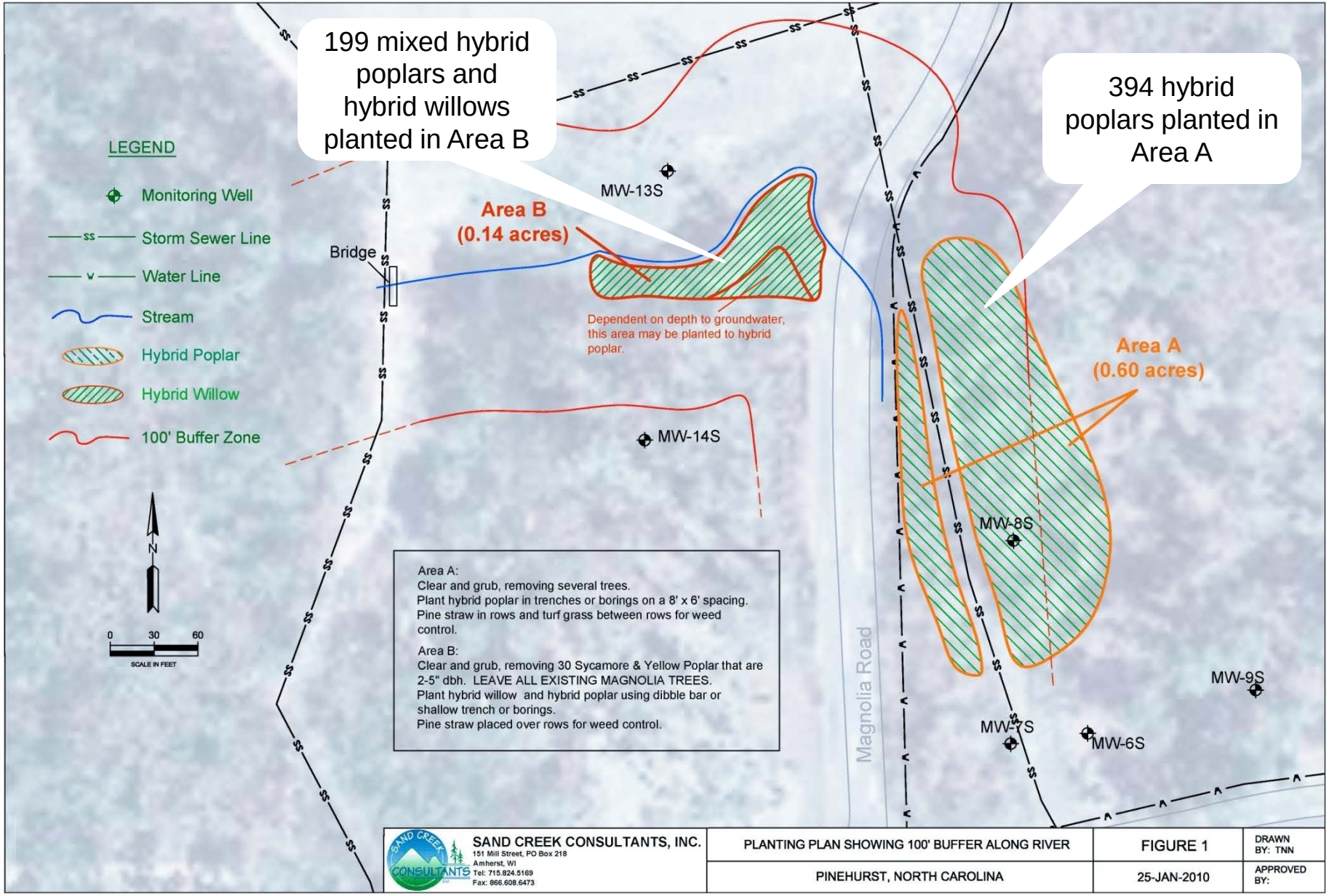
Phytoremediation Area



Phytoremediation Area B Before

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Phytoremediation Area B After

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Phytoremediation Area B 2.5 Years Later

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Phytoremediation Area A Before

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Phytoremediation Area A Before

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Phytoremediation Area A After

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Phytoremediation Area A After

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Phytoremediation Area A 2.5 Years Later

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Phytoremediation Area A 2.5 Years Later

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Excellent Public Perception

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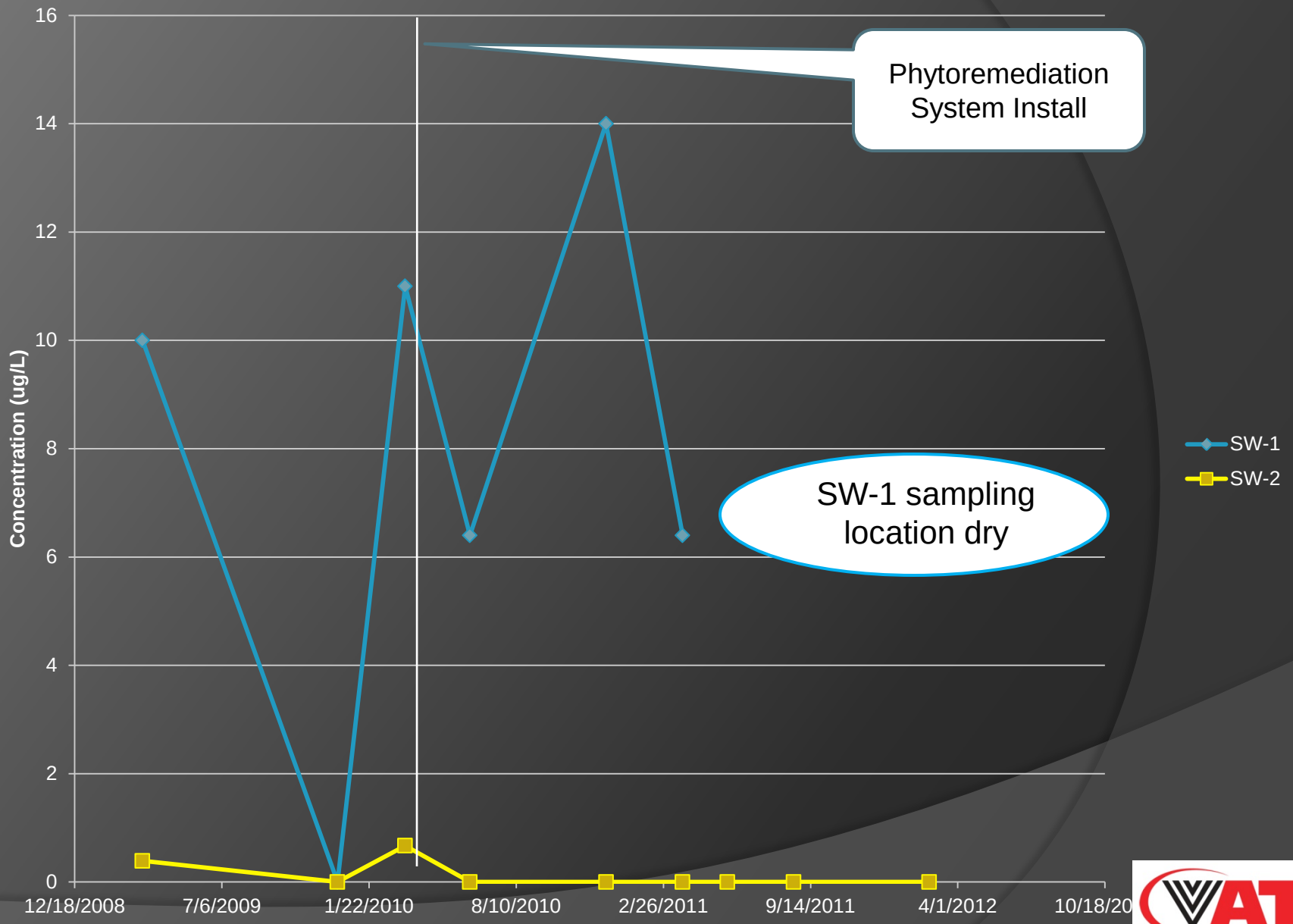
PCE Concentration Vs Time in Surface Water



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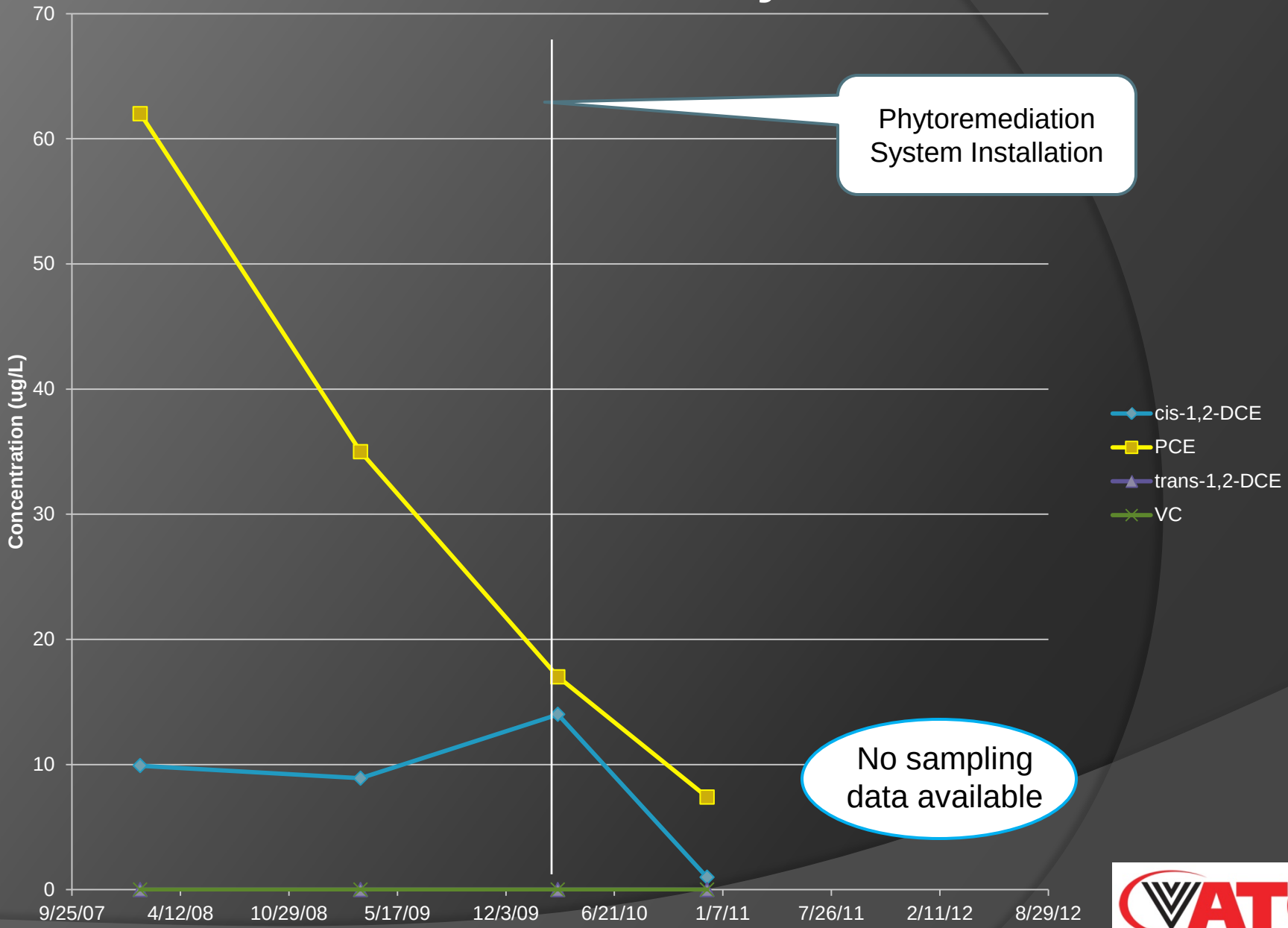
Concentration Vs Time in Phytoremediation Area



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Additional Phytoremediation Details

Costs for this site:

- **Design and planting: $65K**
- **Annual O&M costs ~$10K/year initially, ultimately <$5K/year**

Technology Pros/Cons:

- **Need a large area to plant trees (typically at least 2-3 years travel time)**
- **Need time to establish trees (typically 2-4 years in south)**
- **Best for lower level impacts**

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PROJECT ACCOMPLISHMENTS

- Contaminant plume extent adequately delineated
- Risks posed by contamination successfully addressed
- Public perception challenges successfully addressed
- Only remaining cost is minimal phyto-remediation system O&M

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