Using the USEPA'S Triad Approach for Accelerated Characterization at the Assunpink Creek Brownfields Sites In Trenton, New Jersey

Katherine Linnell

Langan Engineering and Environmental Services, Inc.

July 22, 2003

Langan
Engineering and Environmental Services, Inc.

BROWNFIELDS REDEVELOPMENT

Langan
Engineering and Environmental Services, Inc.

PRESENTATION OUTLINE

- Project Background
- Use of the Triad Approach
- Case Studies
  - Crescent Wire Site
  - Freight Yards Site
- Conclusions

PROJECT BACKGROUND

- Several Brownfields sites in Trenton, New Jersey
- Located within floodplain of Assunpink Creek
- Goal to redevelop into a recreation area

PROJECT BACKGROUND

PROJECT BACKGROUND

Langan
Engineering and Environmental Services, Inc.

USE OF THE TRIAD APPROACH

Benefits

- Expedites redevelopment process
  - Limits sampling events
- Reduces uncertainty of characterization
  - Provides greater certainty to cleanup costs
- Generates necessary information to integrate cleanup with redevelopment

USE OF THE TRIAD APPROACH

Overview

- Systematic Planning
  - Develop project objectives
  - Site Conceptual Model
  - Obtain stakeholder input
- Develop and implement a Dynamic Workplan
  - Outline work scope
  - Identify decision rules
- Real-time analysis
  - Field analytical methods

USE OF THE TRIAD APPROACH

- Effective at
  - Characterizing large areas
  - Delineating contaminants
  - Finding unknown source areas
- Requires
  - Limited initial site data
  - Stakeholder input

USE OF THE TRIAD APROACH

Certain areas of the Trenton project

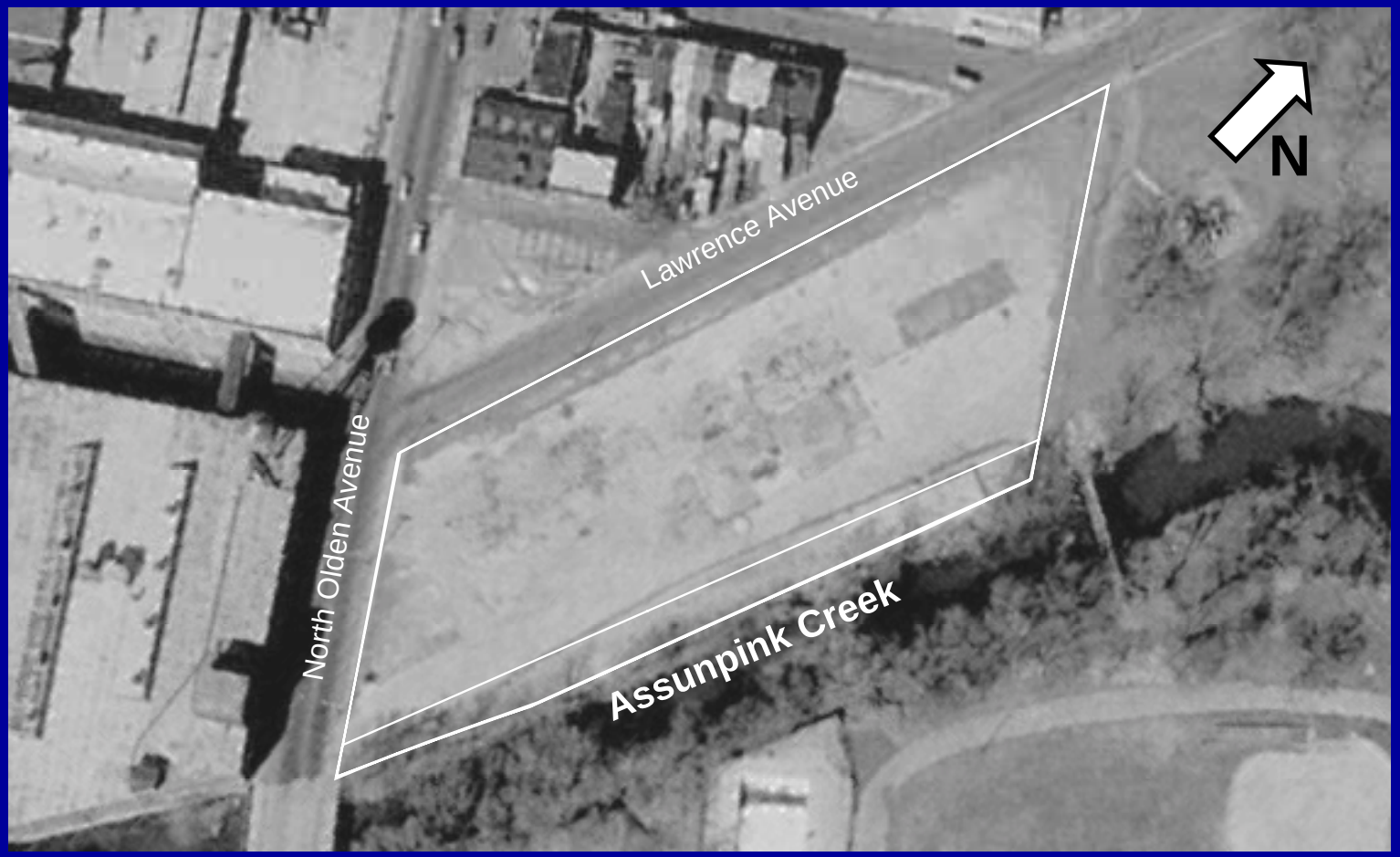
- The Crescent Wire Site
  - Area with PCB/Oil Impacts
- The Freight Yards Site
  - Soil Impacts across the Rail Area
  - Above Ground Storage Tank
  - Areas of Fuel Oil Spills
  - Areas of Distressed Vegetation
  - PAH “hot spot”

USE OF THE TRIAD APPROACH

Field Analytical Methods

- Selected based on project objectives
- Field Analytical Methods (FAMs) :
  - Screening Techniques: Test kits
  - Non-Standard Analytical Methods: GC/MS
  - Standard Analytical Methods: GC/MS SW846 8270

CASE STUDY
CRESCENT WIRE SITE



Langan
Engineering and Environmental Services, Inc.

CRESCENT WIRE SITE

Site Conceptual Model

- PCB/Oil Impacts
  - Impacted at and below the water table
  - Possible source mechanisms
    - Released from upgradient location
    - Placed directly into the subsurface
    - Infiltrated before placement of soil fill

CRESCENT WIRE SITE

Objectives

- Delineate impacts laterally and vertically in soil
- Identify potential source areas
- Evaluate potential for impacts to Assunpink Creek
- Determine need for monitoring wells and sediment sampling

CRESCENT WIRE SITE

Field Analytical Methods Selected

- Immunoassay
  - PCBs
  - TPH
- X-ray Fluorescence
  - Selected Metals

CRESCENT WIRE SITE

Mobile Laboratory

CRESCENT WIRE SITE

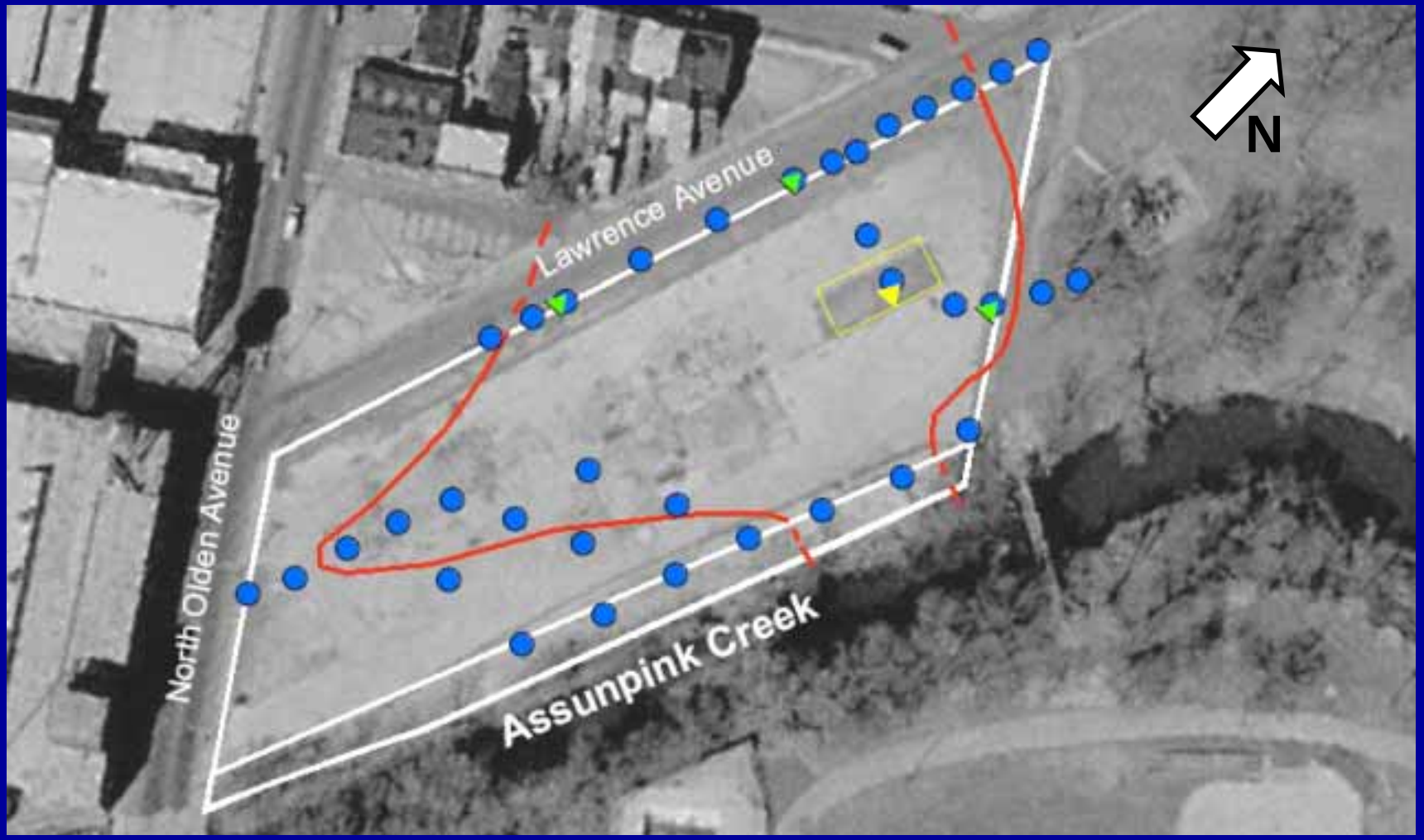
Dynamic Workplan

- Rely on field analytical method results
- Step out sampling per decision rules
  - TPH > 1,000 ppm
  - PCBs > NJDEP Soil Cleanup Criteria (0.49 mg/kg)
- Identify ‘Source Areas’ by relative spatial trends
- Collect limited certified laboratory data for confirmation

CRESCENT WIRE SITE

Langan
Engineering and Environmental Services, Inc.

CRESCENT WIRE SITE



Langan
Engineering and Environmental Services, Inc.

CRESCENT WIRE SITE

Results

- Mapped extent of PCB/Petroleum Hydrocarbon smear zone
- Determined impacts extend to Assunpink Creek
- Enhanced certainty regarding absence of on-site source
  - Reduced groundwater and sediment investigation requirements

CASE STUDY
FREIGHT YARDS SITE

Langan
Engineering and Environmental Services, Inc.

FREIGHT YARDS SITE

Site Conceptual Model

- Contaminant Impacts in Rail Area
  - Black, surficial fill impacted with metals, PAHs, and PCBs
  - No impacts to underlying fill and native soil
- Several “hot spot” areas
  - The AST Area
  - Areas of Fuel Oil Spills
  - Areas of Distressed Vegetation
  - PAH “hot spot”

FREIGHT YARDS SITE

Objectives

- Determine the continuity of the black surficial fill
- Delineate the black surficial fill to the northwest
- Characterize potential impacts to underlying soils and groundwater
- Identify potential unknown soil “hot spots”
- Delineate “hot spots”

FREIGHT YARDS SITE

Sampling Grid in the Rail Area

Langan
Engineering and Environmental Services, Inc.

FREIGHT YARDS SITE

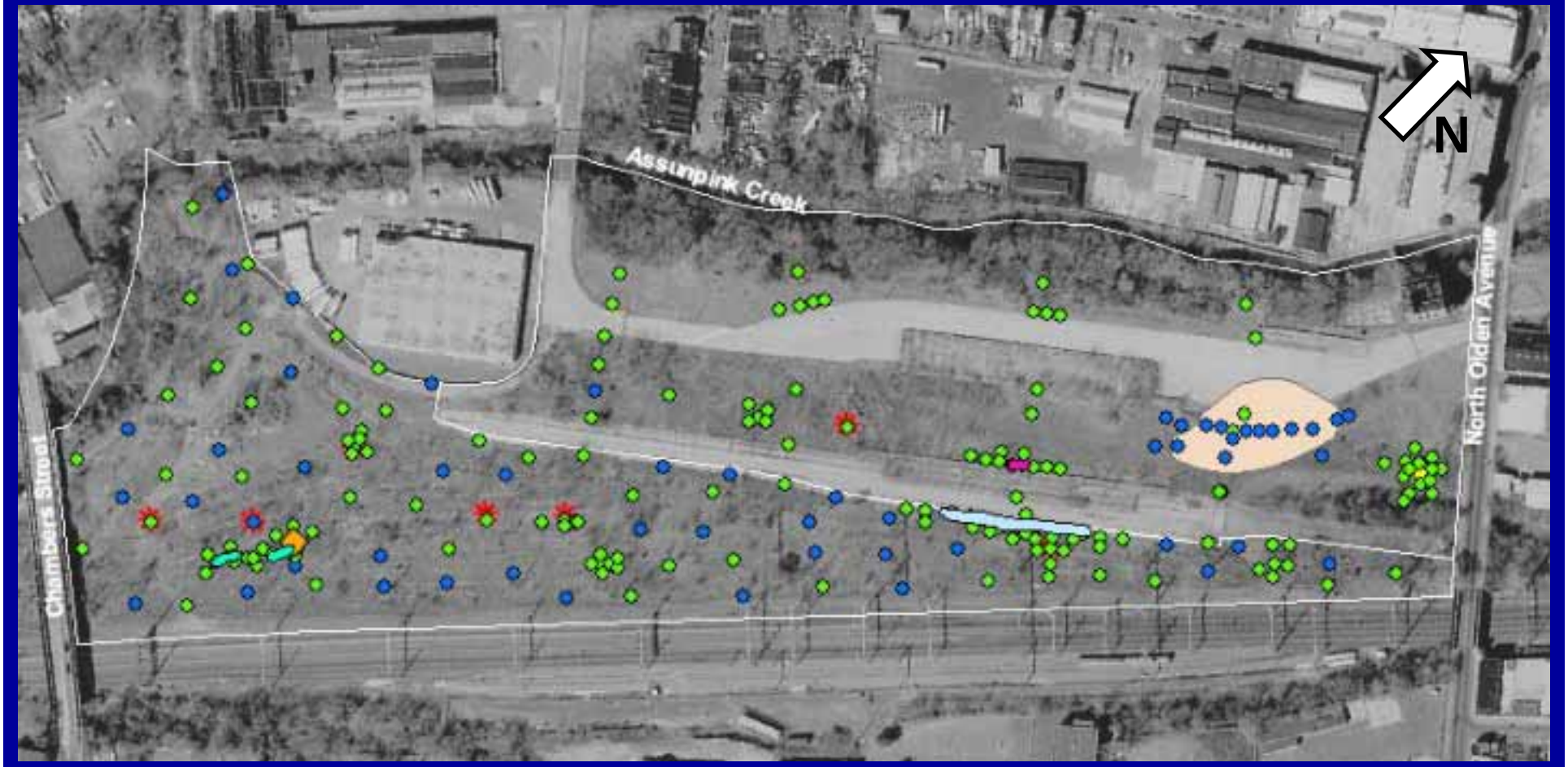
Areas with Distressed Vegetation

Langan
Engineering and Environmental Services, Inc.

FREIGHT YARDS SITE

Langan
Engineering and Environmental Services, Inc.

FREIGHT YARDS SITE



Langan
Engineering and Environmental Services, Inc.

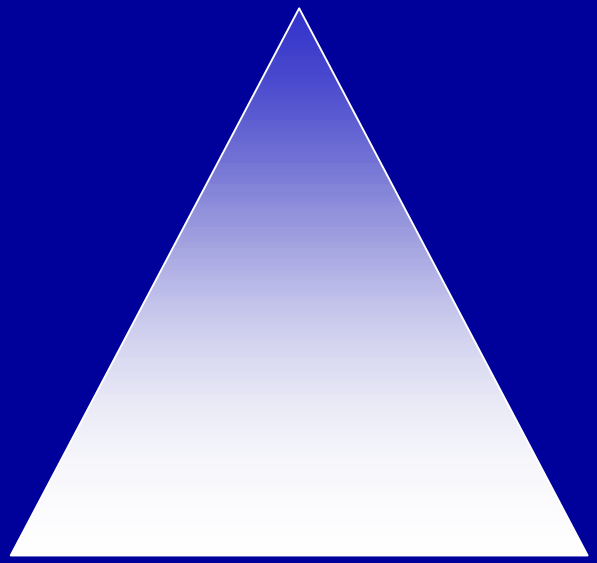
FREIGHT YARDS SITE

Results

- Characterized site wide impacts
  - Found impacted surficial black fill site wide
  - Vertically delineated impacts
- Delineated “hot spots”
  - Identified previously unknown hot spots
  - Characterized potential impacts to groundwater

CONCLUSIONS

PROJECT EXPERIENCE WITH THE TRIAD APPROACH



CONCLUSIONS

Field Analytical Method (FAM) Reliability

- Spatial trends from FAMs improved site characterization process
- Certified laboratory data verified clean zones
- FAMs provided “ballpark numbers”
- Exceedances of standards were generally consistent

CONCLUSIONS

Realized benefits of the Triad Approach

- Reduced site characterization uncertainty
- Expedited remediation process
  - Identified source areas and contaminant distribution in one mobilization
    - One week at Crescent Wire Site
    - Four weeks at the Freight Yards Site
- Increased confidence in establishing remediation scope and budget