Remedial Action Plan Update

One Hour Martinizing
1103 West Club Blvd
Durham, Durham County, NC
DSCA Site #32-0013

May 21, 2015
Overview

- Remedial Action Plan (RAP) Goals
- RAP Components
- RAP Implementation Status
- Monitoring Results
- Next Steps/Schedule
RAP Goals

- Primary Goal: Protect human health by reducing contaminant concentrations and associated vapors.

- RAP Objective: Reduce soil and groundwater concentrations to levels that will reduce vapor exposure risk.
  - PCE Soil Goal = 2.1 mg/kg
  - PCE Groundwater Goal = 2.5 mg/L
RAP Components

Soil Remedial Action
- Excavate soil impacts exceeding 2.1 mg/kg PCE at source property
- Place DARAMEND in base of excavation to enhance bioremediation

Groundwater Remedial Action
- Inject EHC to reduce PCE in groundwater

Monitoring
- Indoor air, soil vapor, and groundwater sampling
RAP Implementation Status

Soil excavation completed in 2012
- 3,850 tons PCE-impacted soil excavated
RAP Implementation Status

- DARAMEND (12,000 lbs) placed in base of excavation
RAP Implementation Status

- Excavation backfilled
- Passive soil vents installed
RAP Implementation Status

- Groundwater EHC injection completed in Jan ‘14
RAP Implementation Status

- Shallow EHC injection
  - 30 Injection Points
  - Targeted water table
  - Total of 15,560 lbs EHC injected
**RAP Implementation Status**

- **Intermediate EHC injection**
  - 14 Injection Points
  - Targeted intermediate depth below water table
  - Total of 4,100 lbs EHC injected
Post-Injection Monitoring

- **Groundwater**
  - Monthly sampling for 3 months, then quarterly through Jan ‘15

- **Soil Vapor Field Screening**
  - Monthly screening through July 2014, then quarterly through Jan ‘15

- **Soil Vapor Sampling**
  - Monthly sampling for 3 months, then quarterly through Jan ‘15

- **Indoor Air (1419 and 1421 Dollar Ave & 1414 Watts St)**
  - Monthly sampling for 3 months, then quarterly through Jan ‘15
Post-Injection Monitoring Results

Groundwater – Shallow PCE Results

Pre-Injection

15 Months Post-Injection
Post-Injection Monitoring Results

Groundwater – Intermediate PCE Results

Pre-Injection

15 Months Post-Injection
Post-Injection Monitoring Results

- MW-15S
  98% reduction

- MW-23S
  96% reduction

- MW-22I
  97% reduction
Post-Injection Monitoring Results

Groundwater – PCE Results Downgradient (MW-4R)

![Graph showing PCE concentration over time with key dates for excavation and injection marked.](image-url)
Post-Injection Monitoring Results

Soil Vapor Screening Results – Methane

- Only detected at low levels (0.1 to 0.4% by volume)
- Only detected near source area
- Higher levels (up to 23.2% by volume) in passive exhaust vent
- Not detected in sub-slab depressurization system at 1414 Watts St
Post-Injection Monitoring Results

Soil Vapor Sampling – Shallow PCE

Pre-Injection

1-Year Post-Injection
Post-Injection Monitoring Results

**Indoor Air**

- **1414 Watts St (Triangle Family Church)**
  - PCE = 11 to 280 µg/m³ (Dec ‘13 – Apr ‘14)
  - Additional mitigation completed in May ‘14
  - PCE = 0.98 to 4.1 µg/m³ (May ‘14 – Jan ‘15)
  - Risk levels acceptable for each post-injection sample

- **1419 Dollar Ave (residence)**
  - PCE = 2.0 to 24 µg/m³; TCE detected in 3 samples = 0.88 to 1.4 µg/m³ (Dec ‘13 – Apr ‘14)
  - Additional mitigation completed in May ‘14
  - PCE = 0.28 to 3.5 µg/m³ and no TCE detected (May ‘14 – Jan ‘15)
  - Risk levels acceptable for each post-injection sample
Post-Injection Monitoring Results

Indoor Air

- 1421 Dollar Ave (residence)
  - PCE = 0.41 to 27 µg/m³; TCE detected in 3 first floor samples from 0.47 to 1.0 µg/m³ and 1 basement sample at 26 µg/m³ (Dec ‘13 – Apr ‘14)
  - Additional mitigation completed in May ‘14
  - PCE = 0.36 to 18 µg/m³; TCE detected in only one first floor sample at 0.75 µg/m³ (May ‘14 – Jan ‘15)
  - Risk levels acceptable for each post-injection sample, except the March 2014 basement sample
Supplemental Monitoring

- **Soil Vapor Sampling**
  - Additional limited sampling completed in March 2015

- **Indoor Air Sampling**
  - 1417 and 1421 Dollar Ave sampled in April 2015
Future Monitoring

Groundwater
- Quarterly sampling of EHC injection through January 2016 per UIC permit requirements

Soil Vapor Field Screening
- Methane consistently low and only detected in a few locations for one-year of post-injection screening
- Future limited field screening may be conducted, if deemed warranted based on groundwater data

Soil Vapor Sampling
- Future limited vapor sampling may be conducted, if deemed warranted based on groundwater data
Future Monitoring

Indoor Air (1419 Dollar Ave & 1414 Watts St)
- Mitigation systems with telemetry systems are in place
- Consistent low concentrations post-mitigation
- No additional indoor air sampling currently planned

Indoor Air (1421 Dollar Ave)
- Mitigation system with telemetry system is in place
- Variable concentrations post-mitigation
- Re-sample indoor air in April 2015, then determine future monitoring schedule
Future Activities

Groundwater

– Conduct limited injection to address increasing concentrations in MW-4R and limit further plume migration
Future Activities

Groundwater

- Plan to inject PlumeStop™ (by Regenesis)
  - Highly dispersible, fast-acting reagent
  - Sorption-based technology captures contaminants and quickly reduces concentrations
  - Provides matrix for enhanced biodegradation
  - Designed to stop migrating plumes and eliminate rebound
Schedule

June 2015
- Install additional monitoring well (MW-24S)
- Conduct PlumeStop™ pre-injection sampling

July 2015
- Complete PlumeStop™ injection
- Conduct EHC post-injection quarterly groundwater sampling

August 2015
- Complete PlumeStop™ post-injection groundwater sampling

October 2015
- Complete PlumeStop™ and EHC post-injection quarterly groundwater sampling
Questions??
Contact Information

DSCA Program Contacts:

Billy Meyer
Project Manager
919-707-8366
Billy.Meyer@ncdenr.gov

Delonda Alexander
Remediation Unit Supervisor
919-707-8365
Delonda.Alexander@ncdenr.gov