



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 4

ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

**ACTION MEMORANDUM**

Date: July 10, 2007

Subj: Request for a Removal Action at the Virginia Carolina Chemical Company-Columbus Site in Columbus, Muscogee County, Georgia.

From: Leslie Sims, On-Scene Coordinator (OSC)  
Emergency Response and Removal Branch

Thru: Anita Davis, Section Chief  
Emergency Response and Removal Branch

Shane Hitchcock, Branch Chief  
Emergency Response and Removal Branch

To: Franklin E. Hill, Director  
Superfund Division

**I. PURPOSE**

The purpose of this Action Memorandum is to request and document approval of the proposed removal action described herein for the Virginia Carolina Chemical (VCC) - Columbus Site, located in Columbus, Muscogee County, Georgia (the Site). The Site poses a threat to public health and the environment that meets the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) section 300.415(b)(2) criteria for removal actions. Records indicate historical operations of a phosphate fertilizer plant at the site. The site has since been redeveloped into approximately 32 parcels of mixed use residential and commercial properties. A removal site investigation performed by EPA's Emergency Response and Removal Branch confirmed the presence of elevated levels of lead and arsenic in surface soils at the site. The total site ceiling, if approved, will be **\$229,800.00**. Of this total, approximately \$208,800.00 will come from the FY 2007 Regional Removal Allowance.

**II. SITE CONDITIONS AND BACKGROUND**

**CERCLIS ID#:** GAN000409850  
**SITE ID#** A4LM  
**CATEGORY** TIME CRITICAL

As part of the Region 4 VCC Initiative with ExxonMobil Corporation, an inventory of 40 former VCC facilities were identified and site specific priorities were established for future assessment and cleanup where warranted. Former VCC facilities with longer operational histories and current residential land-uses were assigned the highest priority. In April of 2004, Exxon Mobile Refining and Supply Company (Exxon Mobile) hired Blasland, Bouck and Lee, Inc. (BBL) to conduct a review of property information and prepare an Operations Integrity Management System sensitive receptor survey for the former VCC fertilizer plant located in Columbus, Muscogee County, Georgia. BBL discovered what appeared to be two separate varieties of magenta-colored material resembling pyrite slag. It was noted that the color of the slag material is different than the regional soil, which is typically a mix of light brown sands and organic material.

In December of 2005, the EPA Science and Ecosystem Support Division, Region 4 (SESD) conducted an insitu XRF screening of lead and arsenic at the Site. The SESD investigation identified lead concentrations in 23 of the 26 locations screened, with levels ranging up to 2600 parts per million (ppm). Four of the areas characterized by high lead concentrations revealed arsenic concentrations from 90 to 260 ppm.

## **A. Site Description**

### **1. Removal Site Evaluation**

On May 30, 2006, pursuant to Section 300.410 of the NCP, EPA's Emergency Response and Removal Branch (ERRB) and the Region 4 Superfund Technical Assessment and Response Team (START) mobilized to the site and conducted a removal site evaluation (RSE) to determine the full extent and nature of contamination at the site. The RSE included a field screening investigation utilizing a portable Nitron XRF. Direct readings for lead and arsenic in soil were taken at 42 locations throughout the site. Twelve samples were collected from the site and delivered to a contract laboratory for metals analysis. One industrial property, 6 residential properties, an elementary school playground, and a right away were sampled. The investigation focused primarily on detecting the presence of arsenic and lead concentrations exceeding EPA's screening level of 40 ppm and 400 ppm, respectively.

The RSE disclosed that there is significant surficial arsenic and lead contamination throughout the Site. Arsenic and lead concentrations were confirmed by laboratory analysis as high as 13,000 ppm and 1,400 ppm, respectively. Small children reside in at least one of the two homes, and play at the school grounds, where arsenic and lead were detected in the surface soils.

## **2. Physical Location**

The site is bounded by residential properties to the northwest, northeast, and north. A drainage feature and the J.D. Davis Elementary School form the eastern boundary. The south/southwest boundary is occupied by commercial, industrial and residential properties. The area is located in the vicinity of the fall line that separates the Coastal Plain and Piedmont physiographic provinces. Topographic relief in the vicinity of the site is moderate with ground surface elevations generally varying from 250 to 360 feet above mean sea level (msl). The site is situated on a topographic slope dipping to the southwest at an elevation of approximately 300 feet above msl. The elevation change in the vicinity of the site is approximately 60 feet. Surface water flow is generally to the south or southwest due to the topography. It generally flows into Weracoba Creek located south of the site. This creek forms part of the larger Chattahoochee River drainage basin.

## **3. Site Characteristics**

The Site is located in a predominantly residential/light industrial area of Columbus, Muscogee County, Georgia. According to historical records, VCC operated a fertilizer and sulfuric acid plant at the site from around 1880 to 1957. Much of the history of the site is unknown; however, it is believed that the company manufactured a product called super-phosphate fertilizer. In the manufacturing process, phosphate was typically stripped from low-grade, phosphate-rich rock, using sulfuric acid processed on-site. Sulfuric acid was processed from pyrite and potentially arsenopyrite, an impurity commonly associated with sulfur ores.

In the early 1900's, sulfuric acid was commonly processed utilizing the lead chamber method. In this method, sulfides, such as copper and iron pyrites were heated to produce sulfur dioxide, leaving iron and arsenic as a by-product. The sulfur dioxide was then mixed with nitric oxide in lead-lined chambers producing sulfuric acid. Sulfuric acid added to finely ground low-grade phosphate-rich rock, would produce super-phosphate, releasing fluorine in the process.

Iron from the burning of sulfides would be the most probable source of the reddish-colored soils encountered at the site. Arsenic from the burning of sulfides such as arsenopyrite would be the most probable source of arsenic contamination. Lead from the lead-lined acid chambers, leached by sulfuric acid, would be most probable source of lead contamination.

#### **4. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant**

Analytical results from sampling conducted by ERRB indicated that arsenic and lead contamination occurs in the surface and subsurface soils at the Site above the removal action levels (RAL) of 40 ppm and 400 ppm, respectively. The maximum arsenic and lead concentration detected in surface soils in the residential area was 13,000 ppm and 1,400 ppm, respectively. Small children reside in at least one of the two homes, and play at the school grounds, where arsenic and lead were detected in the surface soils.

Arsenic and lead are both hazardous substances, listed in the Title 40 of the Code of Federal Regulations (CFR) Section 302.4, as referred to in Section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended. Hazardous substances from the Site will continue to be a threat to public health, welfare and the environment, if not mitigated. Several areas throughout the Site are void of vegetation making them susceptible to wind and surface water runoff during heavy rain events which are common in this geographical area. Storm water drains are positioned throughout the Site and generally flows into Weracoba Creek located south of the site. This creek forms part of the larger Chattahoochee River drainage basin.

#### **5. NPL Status**

The Site is not on the National Priorities List (NPL). The arsenic and lead contaminated soils at the site above the RALs, where feasible, will be removed during this removal action, reducing the potential for future off-site migration. The Agency for Toxic Substances and Disease Registry (ATSDR) has been working with local and state health departments to perform a health risk assessment of the residents.

#### **6. Maps, Pictures, and Other Graphic Representations**

The following figures are attached:

Figure 1 - Site Map

Figure 2 – Site Photographs

#### **B. Other Actions to Date:**

##### **1. Previous Actions:**

All previous actions that have been undertaken in the past by EPA have been discussed in Section II (A, 1). There is no record of any action by state, city or county

government at the Site.

## **2. Current Actions:**

ATSDR is working with local and state health officials to develop a health risk assessment strategy for the residents. The cleanup will not be impacted by this ongoing risk assessment.

### **C. State and Local Authorities' Role**

#### **1. State and Local Actions to Date:**

The Georgia Environmental Protection Division (GAEPD) has been notified of the Site by ERRB. GAEPD has not been involved with the Site to date. State and local health officials have been working with ATSDR on risk assessments and community awareness issues.

#### **2. Potential for Continued State and Local Response:**

It is not anticipated that the GAEPD will perform any response activities at the Site. ERRB will continue to coordinate with ATSDR, state, and local agencies in order to keep the community informed of future removal Site activities.

### **III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

#### **A. Threats to Public Health or Welfare**

The hazardous substances listed in section II (A,4) present in on-site surface and subsurface soils pose the following threats to public health or welfare as listed in Section 300.415 (b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)

*Section 300.415 (b)(2)(i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances pollutants or contaminants.*

The RSE disclosed that there is significant lead contamination throughout the sampled areas of the residential area. Arsenic and lead concentrations exceeding 40 ppm and 400 ppm, respectively, were confirmed by laboratory analysis. The maximum arsenic concentration detected in surface soils in the residential area was 1,400 ppm, and the maximum lead concentration was 13,000 ppm. Small children reside in at least one of the two homes, and play at the school grounds, where arsenic and lead were detected in the surface soils. Human exposure to site related

contaminants may occur via inhalation of windborne dust, inadvertent ingestion of contaminated soil, and direct contact with the contaminated surficial soils.

*Section 300.415 (b)(2)(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.*

Analytical results reveal that high arsenic and lead levels are present at or near the surface creating a potential for migration to off-site locations. Surface water is routed from the site through storm water drains that discharge into a ditch which runs off-site. Off-site migration of contaminants can occur with even small amounts of rainfall.

*Section 300.415 (b)(2)(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.*

At least one residential property and the elementary school playground is void of vegetation making it susceptible to wind and surface water runoff during heavy rain events which are common in this geographical area. Storm water drains are positioned throughout the area to transport the surface runoff to off-site locations.

## **B. Threats to the Environment**

The elevated levels of arsenic and lead in surface and subsurface soils pose the following threats to the environment as listed in Section 300.415 (b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan:

*Section 300.415 (b)(2)(ii): Actual or potential contamination of drinking water supplies or ecosystems.*

Storm water drains are positioned throughout the Site and generally flows into Weracoba Creek. This creek forms part of the larger Chattahoochee River drainage basin. The river and associated wetland areas could be easily affected from migration of contaminants from the Site. Releases of hazardous substances from the Site have the potential to adversely impact these sensitive ecosystems.

*Section 300.415 (b)(2)(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.*

Analytical results reveal that high arsenic and lead levels are present at or near the surface creating a potential for migration to off-site locations. The elevation change in the vicinity of the site is approximately 60 feet. Surface water flow is generally to the south or southwest due to the topography. Off-site migration of contaminants can occur with even small amounts of rainfall.

#### **IV ENDANGERMENT DETERMINATION**

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare, or the environment.

The conditions at the Site meet or exceed the National Contingency Plan (NCP) Section 300.415 (b)(2) criteria for determining the appropriateness of a removal action.

#### **V. PROPOSED ACTION AND ESTIMATED COSTS**

##### **A. Proposed Actions**

##### **1. Proposed Action Description:**

The following actions are proposed, but not limited, for the Site:

- a. Conduct additional sampling to fill data gaps to determine the extent of contamination throughout the Site and potential off-site migration pathways. A cleanup strategy will be developed where an imminent and substantial threat exist.
- b. Excavate the contaminated soils until the removal action cleanup goals have been met.
- c. Restore areas which are disturbed by the removal action to their pre-removal state to the maximum extent practicable.
- d. Assist ATSDR as needed to develop and implement health risk assessment strategy for the residents.

##### **2. Contribution to Remedial Performance:**

The proposed removal action will address the threats discussed in Section III which meet the NCP Section 300.415 (b) (2) removal criteria. Although future remedial action is unlikely, the removal action contemplated in this Action Memorandum, would be consistent with any future remedial action.

##### **3. Description of Alternative Technologies:**

At this time it is difficult to anticipate what disposal and/or treatment alternatives will be

applicable to the waste. Contaminated soil from the Site may be excavated and treated and/or disposed off-site. Alternatively, contaminated soils in some areas may be capped to eliminate the direct exposure pathway. Because the waste materials at the Site have not been fully characterized, no formal evaluation of alternative technologies has been made. Such an evaluation will take place before the disposal phase of the response action and will be documented at that time.

#### 4. EE/CA:

This proposed action is a time-critical removal and does not require an EE/CA.

#### 5. Applicable or relevant and appropriate requirements (ARARs)

The cleanup standards, standards of control and other substantive requirements that have been identified relative to the cleanup, are listed below, and are applicable within the confines of EPA Publication 540/P-91/011, "Superfund Removal Procedures: Guidance on the Consideration of ARARs During removal Actions."

##### Federal, Action-specific

29 CFR Parts 1910, 1926 and 1904: OSHA Health and Safety Regulations

Resource Conservation and Recovery Act (RCRA)

40 CFR 260-272: Hazardous Waste Management System

40 CFR Part 262 - Standards Applicable to Generators of Hazardous Waste:

Subpart B - Manifest

262.20: General requirements for manifesting

262.21: Acquisition of manifests

262.22: Number of copies of manifests

262.23: Use of the manifest

Subpart C - Pre-Transport Requirements

262.30: Packaging

262.31: Labeling

262.32: Marking

Subpart D - Record Keeping and Reporting

262.40: Recordkeeping

40 CFR Part 264 - Hazardous Waste Regulations - RCRA Subtitle C:

268-270: Hazardous and Solid waste Amendments Land Disposal Restrictions Rule

40 CFR Part 300.440 - Procedures for Planning and Implementing Off-Site Response Actions (Off-Site Rule)

49 CFR Parts 171-179: Department of Transportation Regulations for Transport of Hazardous Materials

A letter will be sent to Georgia Environmental Protection Department requesting the State notify the OSC of any state statutes or regulations that are potential ARARs for the Site. The OSC will coordinate with State officials to identify potential State ARARs and, in accordance with the National Contingency Plan and the above-referenced guidance, will determine which state regulations are applicable or relevant and appropriate.

**6. Project Schedule:**

EPA plans to initiate response actions at the Site within one week of the approval of this Action Memorandum. Foregoing any unexpected delays, all actions are expected to be completed within six (6) months of mobilization.

**B. Estimated Costs**

Below is the IGCE to perform the proposed actions outlined above.

| COST CATEGORY  |     | CEILING             |
|--|-----|---------------------|
| <i>REGIONAL REMOVAL ALLOWANCE COSTS</i>                              |     |                     |
| ERRS Contractor  |     | \$170,500.00        |
| Interagency Agreement  |     | \$0.00              |
| <i>OTHER EXTRAMURAL COSTS NOT FUNDED FROM THE REGIONAL ALLOWANCE</i> |     |                     |
| START Contractor   |     | \$21,000.00         |
| Extramural Subtotal  |     | \$191,500.00        |
| Extramural Contingency   | 20% | \$38,300.00         |
| <b>TOTAL REMOVAL ACTION CEILING</b>                                  |     | <b>\$229,800.00</b> |

**VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN:**

If this response action is significantly delayed or not taken, residents will be at risk to prolonged exposure to arsenic and lead.

**VII. OUTSTANDING POLICY ISSUES:**

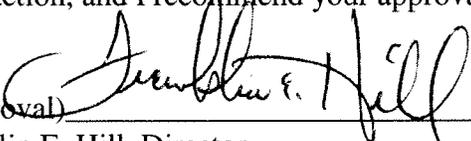
No outstanding policy issues have been identified at this time.

**VIII. ENFORCEMENT:**

Per Attachment II, no PRPs have been identified at the Site which consist primarily of residential properties. No parties have been noticed and EPA does not intend to issue an order at the Site.

**IX. RECOMMENDATION:**

This decision document represents the proposed removal action for the Virginia Carolina Chemical-Columbus Site, located in Columbus, Muscogee County, Georgia. This document was developed in accordance with CERCLA, as amended, and not inconsistent with the NCP criteria. This decision is based upon the administrative record established for the Site. Conditions at the Site meet the NCP Section 300.415 (b)(2) criteria for a removal action, and I recommend your approval of this proposed enforcement removal action.

(Approval)   
\_\_\_\_\_  
Franklin E. Hill, Director  
Superfund Division

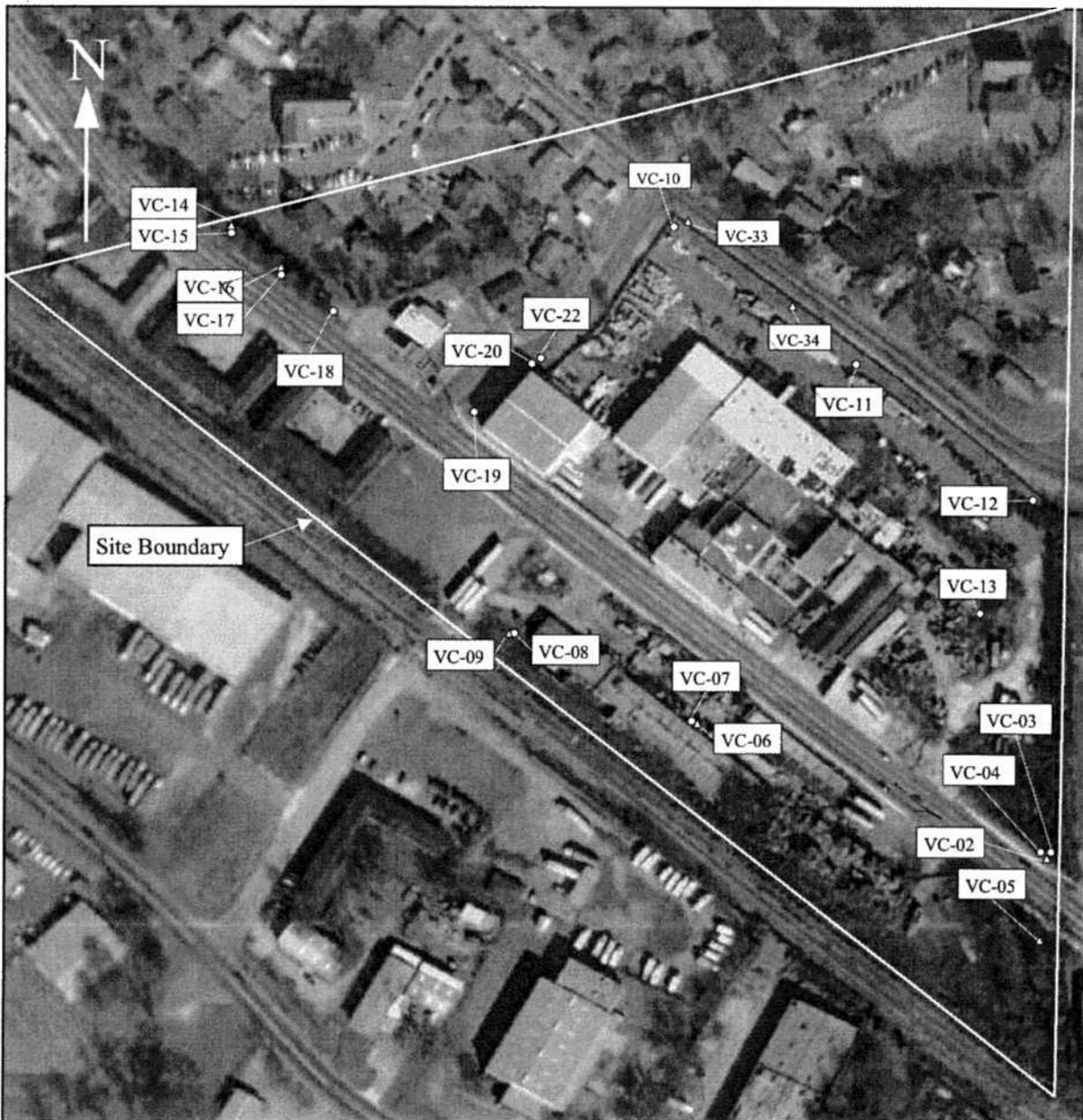
Date 7/11/09

(Disapproval) \_\_\_\_\_  
Franklin E. Hill, Director  
Superfund Division

Date \_\_\_\_\_

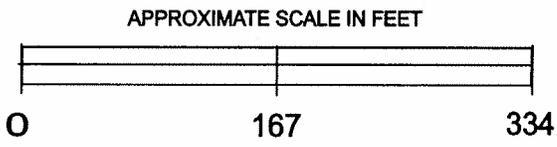
**Figure 1**  
**Site Map**





**Legend**

- 0-6" Grab Sample XRF Screened
- △ Insitu XRF Screen



Map source: USGS 2005.

VC Chemical-Columbus Site  
 TDD No. TNA-05-003-0012  
 Columbus, Muscogee County, Georgia

**FIGURE 2**  
 All American XRF Sample Map

**TNTN & Associates, Inc.**  
**&A** EPA Region 4 START  
 In association with Shaw Environmental & Infrastructure

PHOTOLOG



Date: 5/16/2007  
Description: 1611 Murray Street

Subject: Removal Action  
Photog: L. Sims



Date: 5/16/2007  
Description: 1615 Murray Street

Subject: Removal Action  
Photog: L. Sims

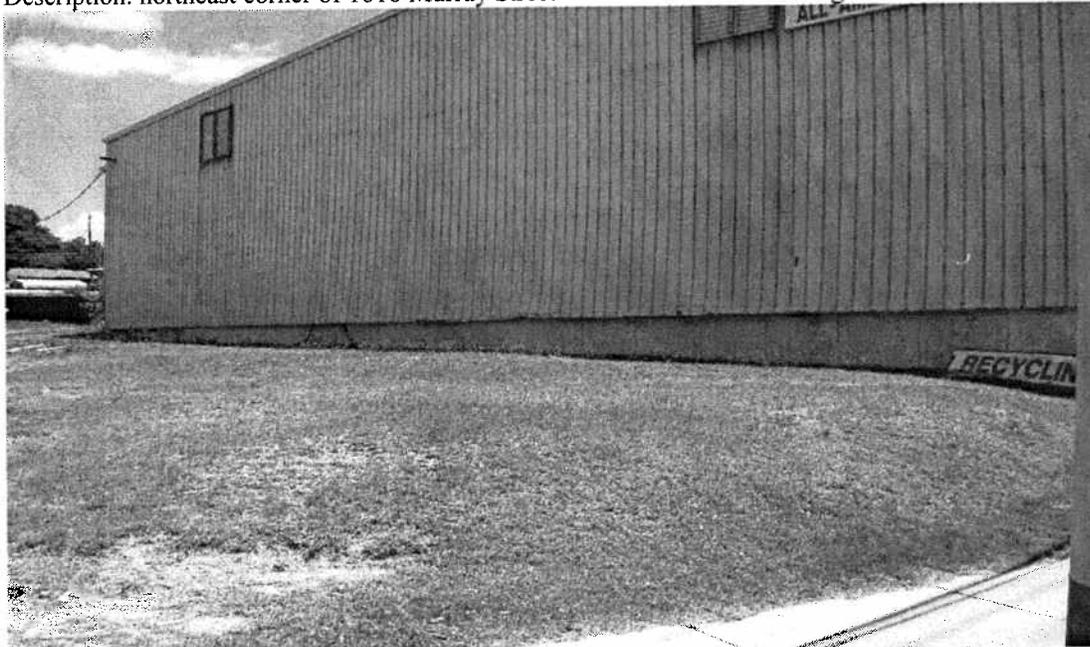
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**Figure 2**  
**Photo Log**



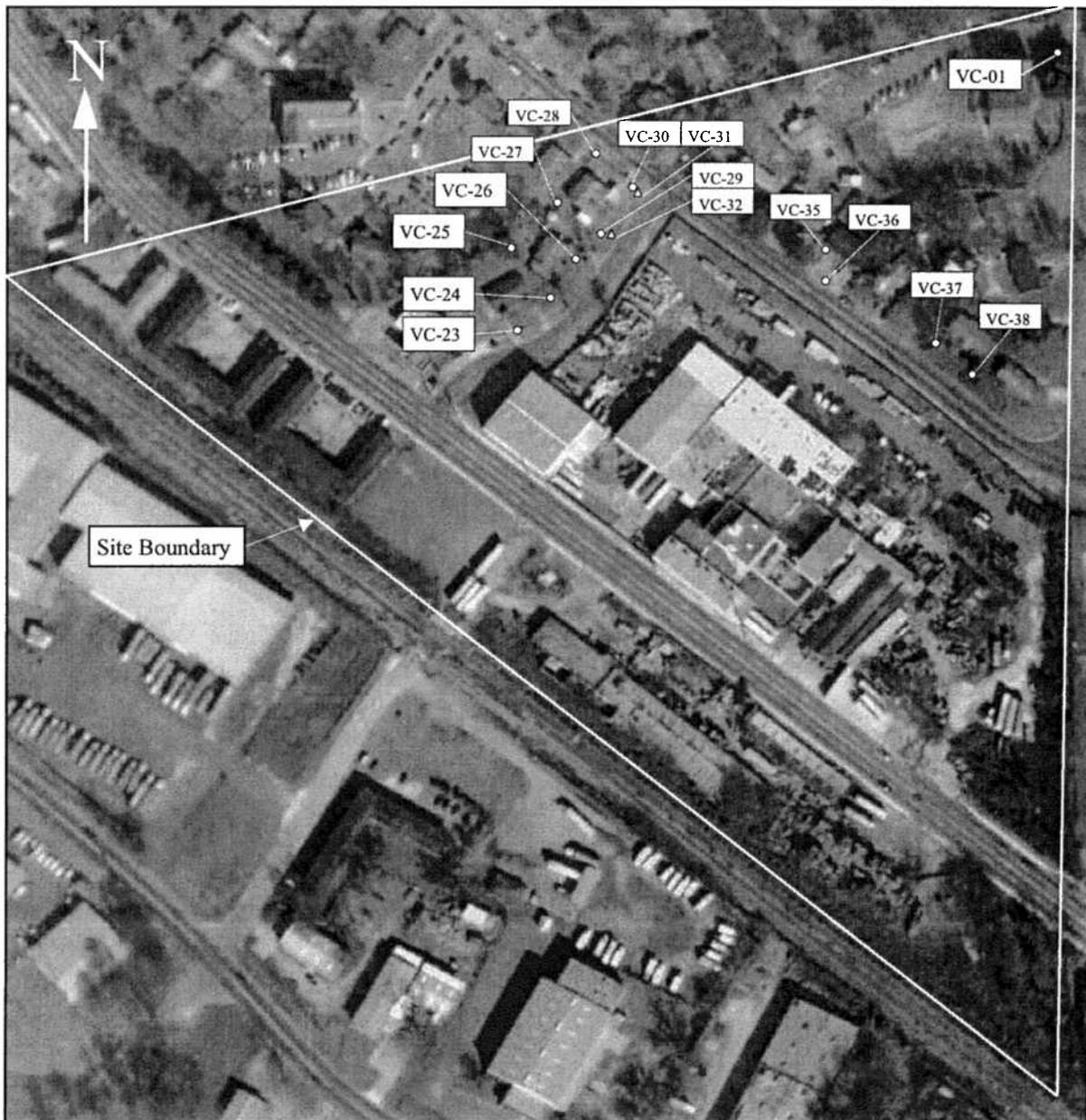
Date: 5/16/2007  
Description: northeast corner of 1616 Murray Street

Subject: Removal Action  
Photog: L.Sims

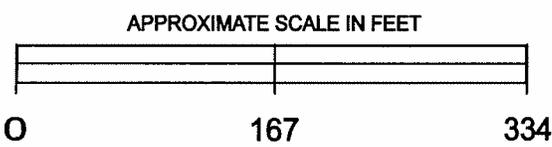


Date: 5/16/2007  
Description: northwest corner of 1616 Murray Street

Subject: Removal Action  
Photog: L.Sims



| Legend |                             |
|--------|-----------------------------|
| ○      | 0-6" Grab Sample XRF Screen |
| △      | Insitu XRF Screen           |

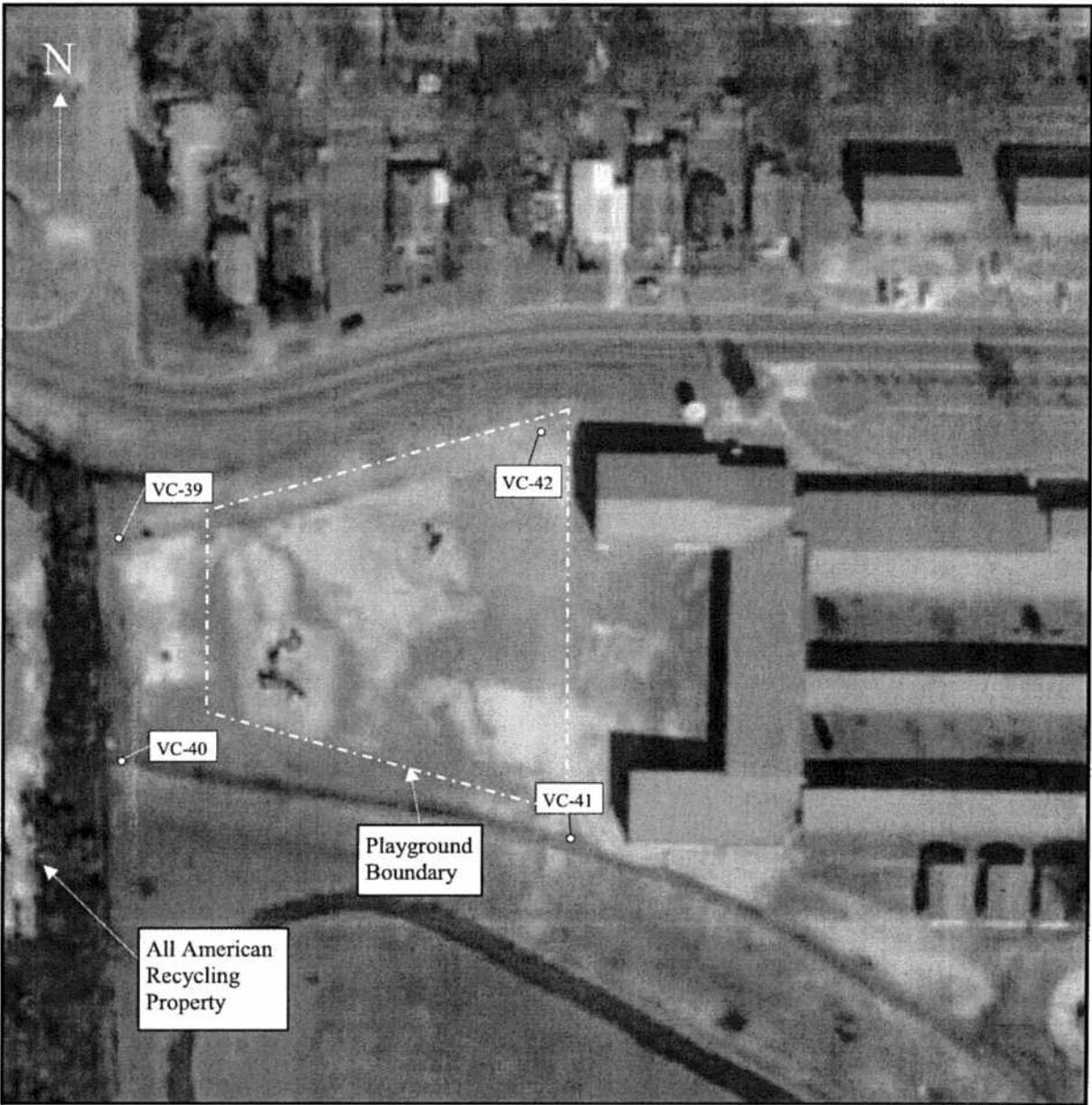


VC Chemical-Columbus Site  
 TDD No. TNA-05-003-0012  
 Columbus, Muscogee County, Georgia

FIGURE 3  
 Residential XRF Sample Map

**TNTN & Associates, Inc.**  
**EPA Region 4 START**  
In association with Shaw Environmental & Infrastructure

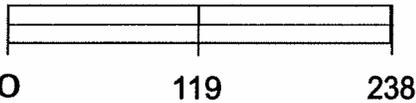
Map source: USGS 2005.



Legend

○ 0-6" Grab Sample XRF Screen

APPROXIMATE SCALE IN FEET

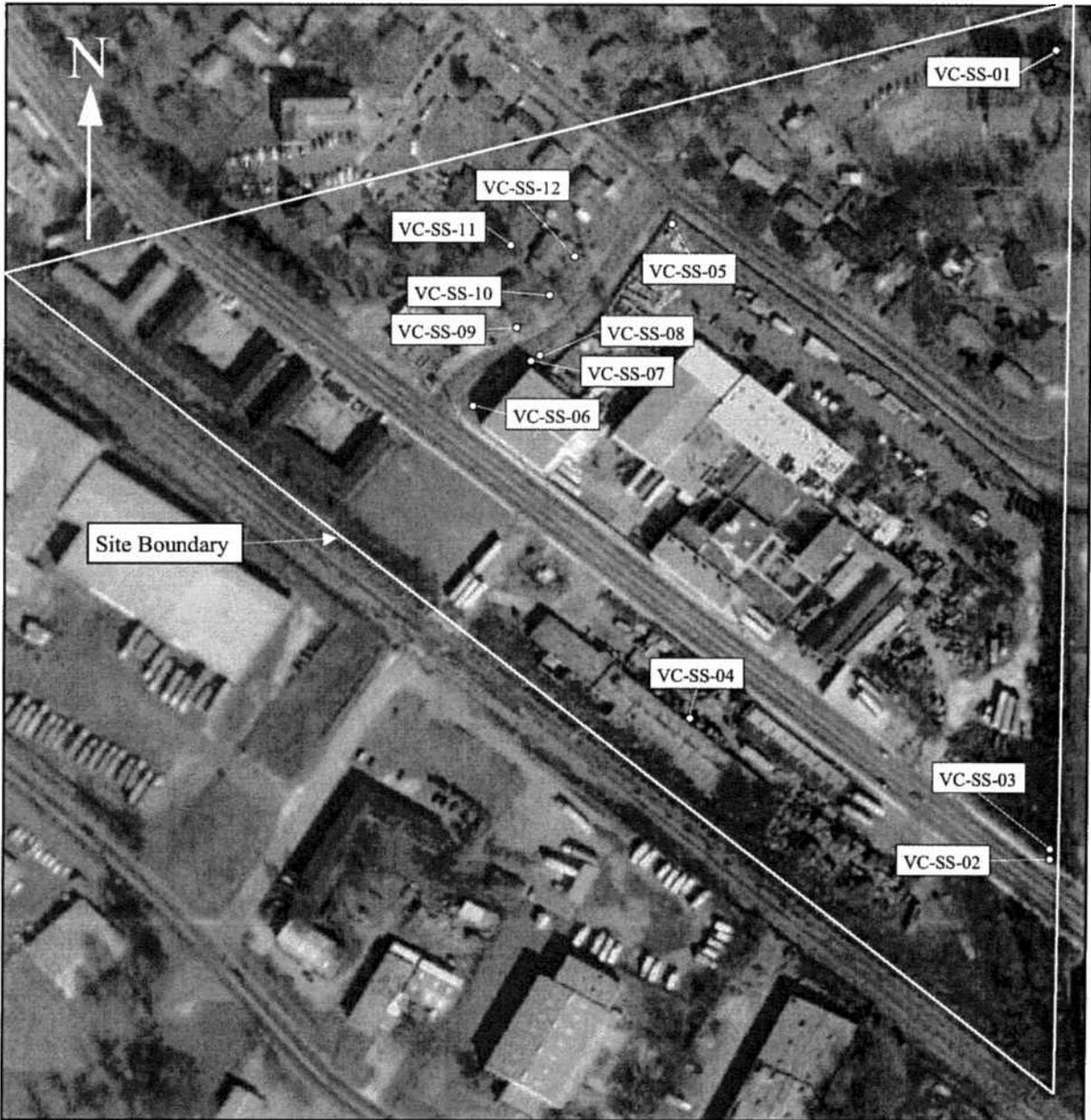


Map source: USGS 2005.

VC Chemical-Columbus Site  
 TDD No. TNA-05-003-0012  
 Columbus, Muscogee County, Georgia

FIGURE 4  
 JD Davis Elementary XRF Sample Map

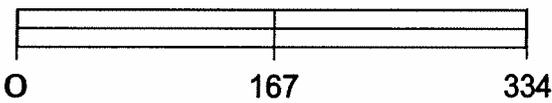
**TNTN & Associates, Inc.**  
**&A EPA Region 4 START**  
 In association with Shaw Environmental & Infrastructure



Legend

○ 0-6" Grab Sample Location

APPROXIMATE SCALE IN FEET



Map source: USGS 2005.

VC Chemical-Columbus Site  
 TDD No. TNA-05-003-0012  
 Columbus, Muscogee County, Georgia

FIGURE 5  
 CLP Sample Location Map

**TNTN & Associates, Inc.**  
**&A** EPA Region 4 START  
 In association with Shew Environmental & Infrastructure