



U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF INSPECTOR GENERAL

## *Cleaning Up Communities*

# **Progress Made, but Improvements Needed at CTS of Asheville Superfund Site in North Carolina to Advance Cleanup Pace and Reduce Potential Exposure**

Report No. 16-P-0296

August 31, 2016



## Report Contributors:

Bakari Baker  
Kathryn Hess  
Tina Lovingood  
Barry Parker  
Kate Robinson

## Abbreviations

AOC	Administrative Settlement Agreement and Order on Consent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	U.S. Environmental Protection Agency
NAPL	Non-aqueous phase liquid
OECA	Office of Enforcement and Compliance Assurance
OIG	Office of Inspector General
RPM	Remedial Project Manager
TCE	Trichloroethylene
TCRA	Time-Critical Removal Action
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter

**Cover photo:** Ambient air sampling outside (left) and inside homes near the CTS of Asheville Superfund site, April 2015. (EPA photos)

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# At a Glance

## Why We Did This Review

In June 2014, Region 4 of the U.S. Environmental Protection Agency (EPA) moved residents from three homes near the CTS of Asheville Superfund site in North Carolina because of unsafe levels of the harmful chemical trichloroethylene (TCE) in the air of their homes. We evaluated whether the region met monitoring and communication requirements, had a schedule for cleanup, and implemented efficiencies to quicken the pace of cleanup.

The EPA placed the site on the Superfund National Priorities List effective April 2012, and oversees the cleanup. The EPA spent about \$11.2 million from 1999 through 2015 conducting studies and cleanup actions. Some or all of those costs may be recovered. The EPA Office of Inspector General has issued three prior reports on EPA actions at the site; this report focuses on actions since January 2012.

**This report addresses the following EPA goal or cross-agency strategy:**

- *Cleaning up communities and advancing sustainable development.*

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Listing of [OIG reports](#).

## ***Progress Made, but Improvements Needed at CTS of Asheville Superfund Site in North Carolina to Advance Cleanup Pace and Reduce Potential Exposure***

### What We Found

Progress has been made since January 2012 in investigating and cleaning up the CTS of Asheville Superfund site. EPA Region 4 set a schedule for cleanup, and met communication requirements. However, improvements could be made to accelerate the pace of investigations and cleanup. Some site monitoring activities conducted since 2012 did not meet all requirements. In particular:

- Vapor intrusion work plans did not include prior sampling to define a completed exposure pathway, the change in TCE toxicity, and the reassessment of prior results against the new standards.
- Monitoring was too limited to characterize TCE around the vapor removal system perimeter fence.

**EPA Region 4 can accelerate the cleanup and completeness of work, and improve public communications, to better control human exposure to unsafe industrial contamination at the CTS site.**

Further, some of the investigations were delayed as the region worked to obtain access to private property, and the region's communication efforts were not always effective, thus hampering the progress of site investigations. The region has not met its commitment to provide online access to documents. In addition, the region missed the opportunity to start the sitewide investigation needed to integrate the focused investigative and cleanup efforts, and to prepare for sitewide cleanup. As a result, the region's site manager had less time to devote to managing the cleanup due to high communication demands, residents potentially experienced prolonged exposure to TCE, and EPA and public health costs potentially increased.

### Recommendations and Agency Response

We made 12 recommendations to improve the region's procedures for site investigation, sampling, monitoring, and communicating with the public. Based on the region's response and a meeting on the response, most recommendations are resolved; three recommendations and parts of another are unresolved with resolution efforts in progress.

### Noteworthy Achievements

According to the EPA, human exposure to contamination at the site now is under control. Region 4 implemented steps to accelerate the pace of cleanup and protect human health, such as requiring the responsible party to construct a removal system to address unsafe levels of TCE in nearby homes. The region also approved a cleanup approach for part of the contaminant source.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

August 31, 2016

**MEMORANDUM**

**SUBJECT:** Progress Made, but Improvements Needed at CTS of Asheville Superfund Site in North Carolina to Advance Cleanup Pace and Reduce Potential Exposure  
Report No. 16-P-0296

**FROM:** Arthur A. Elkins Jr.

A handwritten signature in black ink, appearing to read "Arthur A. Elkins Jr.", is written over the printed name.

**TO:** Heather McTeer Toney, Regional Administrator  
EPA Region 4

Cynthia Giles, Assistant Administrator  
Office of Enforcement and Compliance Assurance

This is our report on the subject evaluation conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). The project number for this evaluation was OPE-FY14-0044. This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures. The findings in this report are not binding in any enforcement proceeding brought by the EPA or the U.S. Department of Justice under the Comprehensive Environmental Response, Compensation, and Liability Act.

**Action Required**

The Assistant Administrator for the Office of Enforcement and Compliance Assurance provided a planned corrective action and completion date that met the intent of the relevant recommendation, and no further response from that office is required. Three recommendations addressed to Region 4, as well as parts of a fourth recommendation, are considered unresolved with resolution efforts in progress. Therefore, in accordance with EPA Manual 2750, the Regional Administrator, Region 4, is required to provide a written response to this report within 60 calendar days. The response should include planned corrective actions and completion dates for all unresolved recommendations. The response will be posted on the OIG's public website, along with our memorandum commenting on the response. The response should be provided as an Adobe PDF file that complies with the accessibility requirements of Section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that the Regional Administrator does not want to be released to the public; if the response contains such data, the Regional Administrator should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at [www.epa.gov/oig](http://www.epa.gov/oig).

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# Chapter 1

## Introduction

### Purpose

The Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA) addressed the following questions regarding the CTS of Asheville Superfund site in North Carolina:

- Are the sampling and monitoring activities at the site meeting established requirements and procedures, and are those results being communicated timely and appropriately to the public?
- Does EPA Region 4 have a schedule with projected and communicated milestones for conducting activities necessary to clean up and protect the health of those who can be impacted by the site?
- Has the region considered and implemented, where possible, efficiencies to quicken the pace of site cleanup?

Our review included EPA activities relevant to our objectives that occurred since January 2012.

### Background

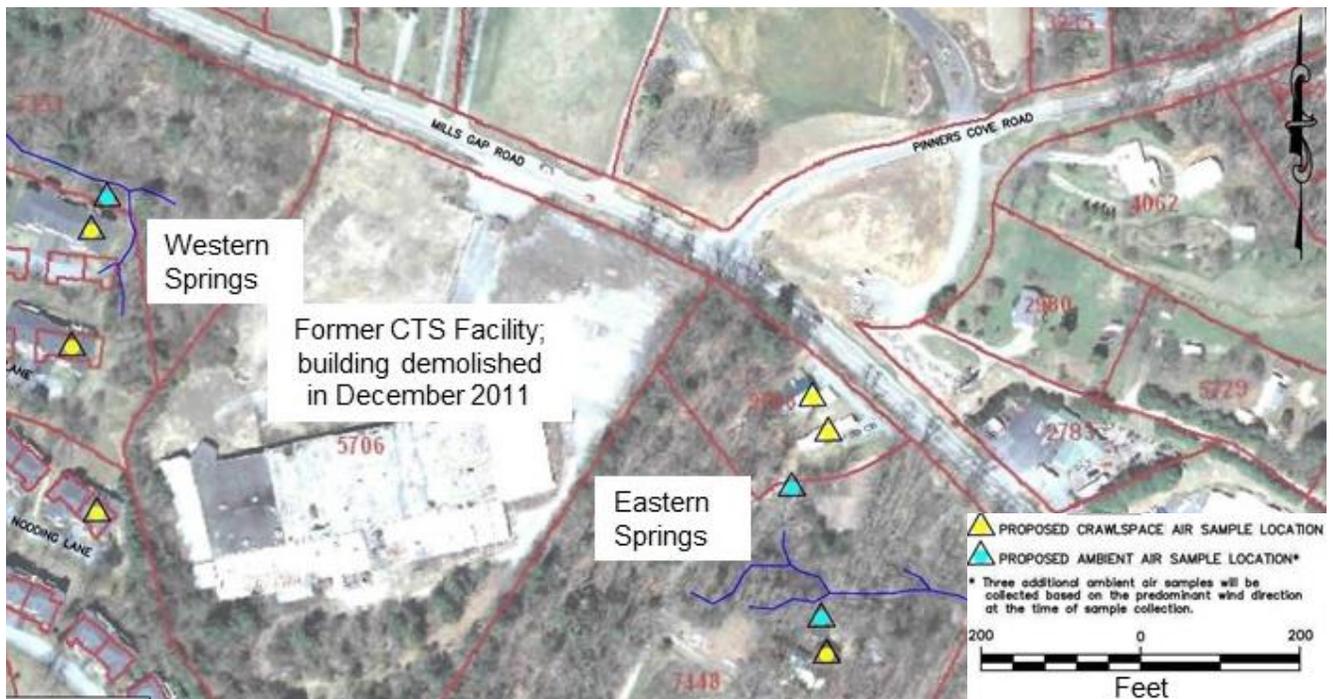
The CTS Superfund site is located in Asheville, North Carolina. From 1959 to 1986, the CTS Corporation manufactured electronic components at the facility. The chemical trichloroethylene (TCE)—a colorless, nonflammable liquid—was used by CTS to clean metal parts prior to electroplating. CTS sold the property in 1987. Later, new owners developed a residential neighborhood on approximately 45 acres (Figure 1), and left fenced in about 9 acres where the manufacturing had occurred.

TCE is known to cause serious health effects (see box at right). In September 2011, the EPA reassessed the human health exposure risks of TCE, which resulted in the EPA lowering the acceptable exposure levels.

#### ***TCE Exposure***

**TCE is a chemical known to cause serious health effects. It can enter the body through several routes, including breathing contaminated air, drinking contaminated water, or ingesting contaminated soil. Exposure to moderate amounts of TCE may cause headaches, dizziness, and sleepiness; large amounts of TCE may cause coma and even death. The EPA specified TCE as cancer causing.**

**Figure 1:** Map of part of the CTS of Asheville Superfund site, showing the former facility, nearby homes, air sampling locations proposed in a September 2012 work plan, and the eastern and western springs. The homes west of the facility were developed on former CTS property.



Source: CTS contractor’s report to the EPA. Labels of the springs and the former facility added by the OIG.

Characteristics of TCE related to its release to the environment under various circumstances are discussed in Table 1.

**Table 1:** Characteristics of TCE released to the environment.

<b>TCE in air</b>	TCE evaporates readily into the air. It has a sweet odor. TCE is broken down quickly in air.
<b>TCE in surface water</b>	TCE dissolved in surface water breaks down slowly, and is removed mostly through evaporation to air.
<b>TCE in groundwater</b>	TCE remains in groundwater for long periods of time because it is not able to readily evaporate from groundwater.
<b>TCE in soil</b>	TCE breaks down slowly in soil and is removed mostly through evaporation to air.
<b>TCE as a NAPL</b>	TCE does not readily dissolve in water and, as such, is known as a non-aqueous phase liquid (NAPL). As a separate phase, TCE will sink, as it is denser than water.
<b>TCE dissolved in other NAPLS</b>	TCE will dissolve into other NAPLS, including a NAPL that is lighter than water, such as oil. When this happens, TCE will be a component of the NAPL at the top of the water table.

Source: OIG analysis of public information.

## ***Early Actions to Assess and Clean Up the Site***

Beginning in 1985, the EPA and the state of North Carolina conducted assessment and cleanup activities at and near the CTS facility. In 1999, the facility and nearby properties were found to be contaminated with TCE and petroleum compounds. CTS, under EPA oversight, removed over 6,000 pounds of solvents from soils at the site, through a soil vapor extraction system that operated from 2006 to 2010. CTS also operated a pilot ozonation system from 2009 to 2010 to eliminate TCE discharging to the springs located to the east of the former facility (Figure 1). The EPA added the site to the National Priorities List effective April 2012 using its authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Sites on this list are commonly known as Superfund sites.



Warning sign on fence surrounding contaminated springs near the former CTS facility. (EPA OIG photo)

## ***EPA's Cleanup Approach***

The EPA has a longstanding policy to pursue “enforcement first” throughout the Superfund cleanup process. EPA guidance emphasizes that a major component of the “enforcement first” policy is that potentially responsible parties should conduct remedial actions whenever possible. This policy promotes the “polluter pays” principle, and helps to conserve federal resources for the cleanup of those sites where viable responsible parties do not exist. The EPA prefers to achieve responsible party-led cleanups through settlement agreements, where the EPA and the responsible party work together based on an agreement.

In the case of a responsible party-led cleanup, the EPA oversees the responsible party in its performance of a remedial investigation (to gather data needed to determine the nature and extent of the contamination and actions needed) and feasibility study (to determine a cost-effective alternative). Following public comment, the EPA chooses the cleanup approach, and documents its choice in a record of decision.

## ***Cleanup and Related Activities Since January 2012***

In January 2012, the EPA and CTS entered into an Administrative Settlement Agreement and Order on Consent (AOC) for the remedial investigation/feasibility study. CTS selected AMEC<sup>1</sup> as its contractor for the remedial

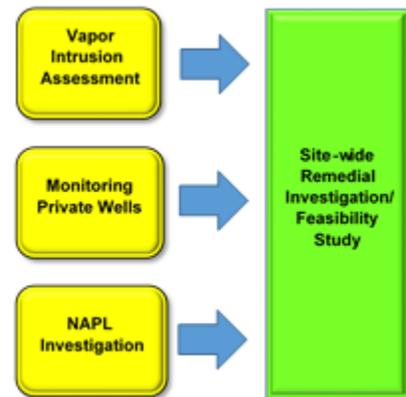
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<sup>1</sup> CTS’s contractor has remained the same for investigation and cleanup actions. However, the name of the contractor has changed. Early actions were carried out by MACTEC. The contractor chosen for the remedial investigation/feasibility study was AMEC, which is now known as Amec Foster Wheeler. In this report, we will consistently use AMEC.



investigation/feasibility study. EPA Region 4 took over from the state of North Carolina primary responsibility to oversee the cleanup. The AOC divides the work for the remedial investigation/feasibility study into two phases, with priority work conducted before the overall, sitewide remedial investigation/ feasibility study. The early actions included conducting a vapor intrusion assessment,<sup>2</sup> continued monitoring of private wells, and conducting a NAPL investigation (Figure 2). The results of these early actions are to expedite remediation of the site in order of the highest priority, and to inform the sitewide remedial investigation/ feasibility study.

**Figure 2:** Division of work specified in the January 2012 AOC for CTS site.



Source: OIG analysis.

The EPA, CTS and Buncombe County (the county where the site is located) have taken several actions at the site since 2012: vapor intrusion assessment, private well monitoring and NAPL investigation. Details on each action follow below, and are summarized in Table 2.

### Vapor Intrusion Assessment

In October 2012, AMEC began the vapor intrusion assessment, and collected samples in the residential area located to the west of the former facility (Figure 1). Vapor intrusion is the migration of volatile chemicals from subsurface-contaminated soils and groundwater into overlying buildings. In April 2014, as a continuation of the assessment, AMEC collected samples on the eastern side of the former facility (Figure 1). Based on the April 2014 results, the EPA moved residents from three homes on June 6, 2014. Unsafe levels of TCE were found in the air in these homes. The air contamination was thought to derive from contaminated groundwater discharging to the nearby eastern springs.

In September 2014, as part of a time-critical removal action (TCRA), CTS began constructing a vapor removal and capture system to reduce the amount

<sup>2</sup> Three documents were available in 2012 to the staff developing and approving the vapor intrusion assessment work plan to meet CTS’s obligations under the 2012 AOC (note: “OSWER,” which stands for Office of Solid Waste and Emergency Response, is now the Office of Land and Emergency Management):

- OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), November 2002, EPA530-D-02-004 (EPA document).
- Vapor Intrusion Pathway: A Practical Guideline, Interstate Technology Regulatory Council, January 2007.
- Superfund Vapor Intrusion FAQs, February 2012 (EPA document).

A more recent document applies to current and future work at the site:

- OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, June 2015, EPA OSWER Publication 9200.2-154 (EPA document).

of TCE vapor in the area of the eastern springs. This brought the indoor air TCE concentration to below the level the region set for the system, which is the level the EPA had established as safe in 2011. AMEC reported that during its first 6 months of operation, the system removed approximately 42 pounds of volatile organic compounds from the environment.

With the TCRA system in place, the levels of TCE in air in the three homes dropped to safe levels, and the residents returned to their homes in November 2014. AMEC conducted additional air testing in these and additional homes through April 2015. Monitoring of ambient air and flow out of the treatment system continued quarterly. Results in August 2015 showed that the system was not removing TCE to the same degree it had when first constructed. CTS and AMEC took action to modify the system. Monitoring results in January 2016 showed that the system was again effectively removing TCE. According to the region and AMEC, ambient air and system monitoring will continue quarterly.

### Private Well Monitoring

In January 2013, CTS assumed responsibility from the region for the quarterly monitoring of drinking water wells. The scope of our evaluation did not include assessing monitoring of the drinking water wells, because we had reviewed this as part of our prior work. CTS and Buncombe County took additional actions to ensure nearby residents had access to safe drinking water. CTS voluntarily installed filter systems in homes in which drinking water was supplied by private wells that were potentially contaminated. The county elected to extend its public water delivery system to nearby homes.



Sampling water from a filter system to provide information to residents on the quality of their drinking water. (AMEC photo)

### NAPL Investigation

In September 2013, AMEC began field implementation of the EPA-approved NAPL investigation work plan. The EPA then requested that CTS conduct a focused feasibility study, to evaluate potential remedial alternatives to address the NAPL that had been found at the top of the water table under the former facility. This NAPL was mostly petroleum-related compounds that were lighter than water. However, laboratory analyses showed that about 35 percent of the NAPL was TCE. In June 2015, CTS expanded investigative activities westward to delineate the extent of shallow groundwater contamination. In October 2015, based on the results of CTS's focused feasibility study, the EPA proposed action to reduce subsurface contamination. Based on comments received from the EPA and the community, CTS expanded its proposed action in December 2015. In February 2016, the EPA signed a record of decision for

interim remedial action that included source control action for NAPL and TCE on the former facility property. The interim action will be followed up with a final sitewide cleanup decision that is not expected for several years.

**Table 2:** Actions and outcomes at the CTS of Asheville Superfund Site since 2012.

Actions	Outcomes
<p><b>Vapor Intrusion Assessment</b></p> <ul style="list-style-type: none"> <li>• Sampled air near springs (Figure 1).</li> <li>• Temporarily relocated residents exposed to unsafe levels of TCE in indoor air.</li> <li>• Implemented a vapor removal and capture system at eastern springs.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced TCE in indoor air to safe level.</li> </ul>
<p><b>Private Well Monitoring</b></p> <ul style="list-style-type: none"> <li>• Quarterly monitoring.</li> <li>• Installed filter systems in some private homes.</li> <li>• Installed public water distribution system to some private homes.</li> </ul>	<ul style="list-style-type: none"> <li>• Informed residents of the quality of their drinking water.</li> <li>• Prevented exposure to TCE in drinking water.</li> </ul>
<p><b>NAPL Investigation</b></p> <ul style="list-style-type: none"> <li>• Remedial investigation conducted of near-surface NAPL.</li> <li>• Focused feasibility study conducted to identify remedial alternatives.</li> <li>• Investigative activities expanded westward to delineate the extent of shallow groundwater contamination.</li> <li>• Public comment provided on remediation alternatives.</li> <li>• Record of decision issued for interim remedial action to clean up near-surface NAPL and TCE in groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>• Provided foundation for cleanup decision.</li> <li>• Anticipated outcome includes mitigating transport of TCE to the springs.</li> </ul>

Source: OIG analysis of EPA documentation.

### **Site Status**

The EPA recorded in its [Superfund database](#) that human exposure to contamination at the CTS site is under control, but insufficient data were available to understand whether groundwater migration was under control. The EPA has spent approximately \$11.2 million at the site from 1999 through December 2015 conducting removal and remedial studies and cleanup actions; some or all of these costs may be recovered.

### **Responsible Offices**

The responsible offices for this report are EPA Region 4 and the EPA’s Office of Enforcement and Compliance Assurance.

## Noteworthy Achievements

Progress has been made in investigating and cleaning up the site since January 2012. The region took four actions that are noteworthy:

- Required CTS to construct a system to reduce TCE in air inside homes near the contaminated springs.
- Requested that CTS expand its investigative activities to the west of the former facility.
- Approved a cleanup approach for part of the contaminant source.
- Issued Special Notice Letters to CTS and two other potentially responsible parties.

In response to unsafe levels of TCE measured in air inside three homes near the contaminated springs east of the former facility, the region in the fall of 2014 worked with CTS and its contractor—AMEC—to construct and operate a vapor removal system. The outcome has been the reduction of TCE in air inside the homes to a safe level.

In March 2015, the region requested that CTS expedite characterization work west of the former facility. This work delineated the extent of shallow groundwater contamination. The results informed the 2016 cleanup decision.

The region moved toward cleanup of part of the contaminant source when it signed a record of decision for interim remedial action in February 2016. Previously, in August 2015, the region requested that CTS expand its proposed cleanup action. Community comments that followed supported this expansion. The expanded action approved in the record of decision is expected to cost \$8.9 million, is designed to treat an area three times larger than originally proposed, and is anticipated to protect human health and the environment by mitigating transport of TCE to the springs. The interim action record of decision states that remaining unacceptable risks posed to human health and the environment will be addressed in the final sitewide remedy.

The region issued Special Notice Letters to three potentially responsible parties, including CTS, in May 2016. These letters are an important step in the legal process by which the EPA formally requests that potentially responsible parties perform remedial work at a site under EPA oversight and according to EPA-approved work plans.

## Scope and Methodology

We conducted our work from July 2014 to June 2016. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

To accomplish our objectives, we obtained site information from EPA Region 4 personnel, including the site's Remedial Project Managers (RPMs). We examined site documents in the EPA's Superfund Enterprise Management System, and information provided by many parties during the review. This information included email and other correspondence; work plans; sampling and monitoring results; and community involvement, removal, remedial and enforcement-related documentation. We visited the CTS site, and met with the property owners adjacent to the east side of the former CTS facility. We interviewed staff in EPA Region 4 and headquarters. We followed up with stakeholders who independently provided information to us, including community members, and a University of North Carolina professor who had conducted sampling at the site. We reviewed relevant requirements, guidance and policy. We examined the EPA's site-specific web pages. We gathered stakeholder comments made at an EPA OIG listening session held on August 21, 2014, in Asheville. We also reviewed the three prior OIG reports related to the CTS site (detailed in Appendix A).

As part of our work, we evaluated whether the region considered and implemented cleanup efficiencies. An efficiency is a change in procedure or process that requires fewer resources or time to reach the intended result. Based on our objectives, we limited our evaluation to efficiencies that result in accelerating the pace of cleanup, or investigations that gather information needed to plan and conduct cleanup.

## **Chapter 2**

### **Some Sampling and Monitoring Activities Did Not Meet Requirements and Were Delayed**

Some monitoring activities conducted since 2012 for the CTS of Asheville Superfund site did not meet all requirements and were delayed. We identified problems with the plans for investigative and system monitoring, including:

- Vapor intrusion work plans did not include prior sampling results defining a completed exposure pathway, the change in TCE toxicity, and a reassessment of prior results against the new standards.
- Monitoring was too limited to characterize TCE levels around the vapor removal system perimeter fence.

Further, the NAPL and some of the vapor intrusion investigations were delayed as the region worked to obtain access to private property. Also, the region's communication efforts related to the investigation work plans were not always effective. These issues hampered progress in conducting the investigations. Consequently, residents living near the contaminated eastern springs could have been exposed for a longer time to unsafe levels of TCE in the air in their homes.

#### **Problems With Some Plans and Work Conducted Hampered Progress**

In the OIG's opinion, the plans for the NAPL and vapor intrusion investigations did not fully address the objectives for those specific investigations established with CTS in the 2012 AOC. The work conducted for the NAPL investigation was not sufficient to fully meet an objective stated in the work plan. In addition, the vapor intrusion plans did not initially include indoor sampling, did not report all relevant prior information, and omitted the recent change in TCE toxicity. Perimeter monitoring for the TCRA system was not extensive, with no information on TCE levels in air and water leaving the eastern end of the fenced area being gathered on a regular basis. Consequently:

- The full investigation of the extent of groundwater contaminated by the shallow NAPL was delayed.
- NAPL in the fractured bedrock remains to be investigated as a potential source of contamination to groundwater.

- Residents living near the contaminated springs potentially were exposed to unsafe levels of TCE in the air in their homes longer than they would have been if air sampling had met established procedures.
- Uncertainty remains about the levels of TCE in parts of the private property that surrounds the TCRA system.

### ***Work Plan and Execution Inadequate to Define NAPL***

The 2012 AOC called for sampling and analyzing NAPL in the “saturated zone,”<sup>3</sup> which is the subsurface zone below the water table. However, the region’s approved work plan limited the investigation to the shallow subsurface and did not include the deep bedrock. The region asserted that it prioritized the shallow subsurface because it believed (1) this was the source of contaminated groundwater emanating from the springs and contributing to human exposure, and (2) this work could be done quickly and result in interim cleanup work. However, prior results showed high levels of TCE deep in the subsurface that suggested NAPL was in the underlying fractured bedrock. By not investigating NAPL in the fractured bedrock, AMEC did not fully investigate NAPL in the saturated zone, as called for in the AOC.

The region asserted it had discretion to approve a work plan that did not meet all related objectives set out in the AOC. However, good practice would call for the region to exercise this discretion in a transparent, public manner. The region’s approval letter of the work plan in 2012 did not establish an expectation that the investigation of deeper NAPL would be conducted later. Four years later, in its record of decision for remedial action, the region stated its intent to further study the deep bedrock. In the meantime, if NAPL is in the fractured bedrock, it serves as a continuing source of contamination to groundwater.



Investigation to define shallow subsurface contamination. (EPA photo)

In addition, the work AMEC conducted was not extensive enough to meet one of the objectives established in the work plan the region had approved in 2012—to evaluate the groundwater contamination resulting from the NAPL in the shallow subsurface. The plan did not provide a contingency to extend the sampling to collect the information needed to meet this objective. The region took steps in 2015 to fill the data gap, and approved a new work plan with the objective to delineate the extent of the groundwater plume above bedrock. However, because the work was conducted after the feasibility study was underway, the interim remedial action CTS proposed to address the shallow NAPL did not include remediating the groundwater already contaminated by that NAPL. Based on comments received from the region and the community,

<sup>3</sup> The Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study between U.S. EPA Region 4 and the CTS Corporation, January 26, 2012, p. A-5.

CTS proposed expanding its action in November 2015, and in February 2016 the region approved the expanded action through an interim record of decision. While the outcome is an action that, once taken, will address the source of contamination and the groundwater above bedrock already contaminated, its design and implementation have been delayed because the initial sampling was not extensive enough to meet an objective stated in the initial work plan.

**Problems With Work Plans Potentially Prolonged Exposures to Unsafe Levels of TCE in Air**

The region approved work plans in 2012 and 2014 for air sampling near the western and eastern springs that did not meet all requirements and procedures, and potentially prolonged exposures of nearby residents to unsafe levels of TCE in air in their homes. We identified several problems with the plans, including that the scope was too limited, the work would not assess a direct air exposure pathway that was known to be complete, indoor sampling was not included in the 2012 plan, and property owners were not meaningfully engaged. In addition, delays in the region modifying the plan and the region’s review of that plan were inconsistent with the urgency implied by the region’s reassessment, which showed an indoor air result from 2008 that exceeded the level of TCE the region considered safe as of September 2011. Also, the delays were not consistent with the RPM’s expressed concerns for the health of the residents living near the contaminated springs.

**Vapor Intrusion Not Completely Assessed Because of Limited Work Plan Scope**

The region approved a work plan in 2012 that narrowly focused on the presence of contaminants in ambient and crawl space air (Table 3) and not on how the contaminants got to locations where potential exposure may have occurred.

**Table 3: Air sampling to assess vapor intrusion at nearby homes**

Date of work plan	Extent of sampling approved	Sampling conducted	Date of sampling	Outcome
September 2012	Crawlspace air under six homes and ambient air near eastern and western springs.	Crawlspace air under two homes, basement air in one home, and ambient air near western springs.	October 2012	TCE detected in all samples, but at levels considered safe if samples had been collected indoors.* No assessment of TCE levels near eastern springs.**
March 2014	Indoor air in, and crawlspace air under, three homes, and ambient air near eastern springs.	As planned.	April 2014	TCE levels in all indoor air samples were unsafe, prompting an emergency evacuation of homes near eastern springs. TCE in all ambient and crawl space samples were similarly elevated.

\* EPA Region 4 established safe levels of TCE in indoor air; the region has not established safe levels in crawl space or ambient air.

\*\* See section, “Execution of Work Plans Delayed Due to Property Access Problems.”

Source: OIG analysis of EPA documentation.



In addition, the work did not include collecting subsurface information, such as concentrations of contaminants in soil gas and groundwater near the homes, which meant that the region could not rule out vapor intrusion as contributing to the TCE measured in the homes. As such, the scope of the work was limited and the work did not fully meet the objective in the AOC to evaluate vapor intrusion.

### Unsafe Exposures May Have Occurred for Longer Because Sampling Inside Homes Was Delayed

In the OIG's opinion, the region did not follow relevant guidance for evaluating vapor intrusion<sup>4</sup> when, in September 2012, it approved a work plan that did not include sampling air inside homes. Indoor air sampling in some of the homes would have been consistent with new information on TCE toxicity, prior information collected at the site that showed a completed exposure pathway, the region's reassessment that showed a prior result exceeded the new levels, and concerns the RPM expressed for the health of residents living near the contaminated springs. As sampling inside homes was delayed from October 2012 to April 2014, residents may have been exposed to unsafe levels of TCE for a year-and-a-half longer than if AMEC had included indoor sampling in its initial work plan.

#### *2011 TCE Toxicity Changes Not Included in 2012 Work Plan*

In September 2011, the EPA released new information on risks associated with exposure to TCE.<sup>5</sup> The approved work plan did not include this change in TCE toxicity. With this new information, the EPA lowered the level of TCE it considered safe in indoor air. The level of TCE in the home closest to the eastern springs had been considered safe when measured in 2008. However, that 2008 TCE measurement was above the level considered safe as of September 2011. We did not find document-based evidence that the RPM recognized the change in risk of exposure to TCE to nearby residents when, in September 2012, the RPM approved the vapor intrusion work plan that did not include indoor air sampling, or denied the owner's request in October 2012 to sample inside the home nearest the eastern springs. Our review of internal emails showed that the RPM did not reassess the 2008 result until late February 2013.

#### *Not All Relevant Prior Information Included in the Work Plan*

The work plan the region approved in September 2012 did not report or summarize all the relevant prior results of air and groundwater sampling. According to 1988 remedial investigation/feasibility study guidance,

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<sup>4</sup> Two EPA and one Interstate Technology and Regulatory Council documents were available to guide the vapor intrusion assessment CTS developed in 2012 to meet its obligations under the 2012 AOC. See footnote 2.

<sup>5</sup> Toxicological Review of Trichloroethylene, September 2011, EPA/635/R-09/011F.

collection and evaluation of existing data is the first step in scoping a remedial investigation. In addition, the results included were compared to the removal action levels applicable at the time the samples were collected, not to the levels in effect when the work plan was drafted. Most notably, the plan did not report that the TCE result obtained in 2008 from inside the home nearest the eastern springs exceeded the removal action level the EPA set in 2011 based on the new toxicity information. The exceedance meant that an exposure pathway was complete.

In a May 2012 review of the draft work plan, the regional risk assessor assigned to the site asked for additions. The requested addition of summary tables for existing data, compared to current screening levels, would have resulted in an earlier acknowledgment that TCE in air inside one home in 2008 exceeded the level currently considered safe. The requested addition of a summary figure showing the extent of contamination would have presented the relationship of the proposed sampling locations to the known extent of the groundwater contamination. These requested additions were consistent with EPA vapor intrusion guidance. However, the RPM approved the plan without these additions. The risk assessor also stated that “a defensible [vapor intrusion] investigative approach should be based on the site-specific conceptual model.” As discussed in a section that follows, no conceptual models had been developed in 2012.

#### *Delay in Requesting and Reviewing CTS Work Plan Was Inconsistent With Expressed Health Concerns*

Even after Region 4 recognized the need for indoor air sampling in March 2013, exposure to potentially unsafe air was prolonged because sampling of indoor air was delayed. At AMEC’s request, the region did not require AMEC to revise its work plan to include indoor air sampling until signed access agreements were obtained. After access was obtained, the region did not approve a revised work plan for 4 months, as revisions were needed. This delay was inconsistent with the RPM’s expressed concerns about the health of the residents living near the springs. In addition, having an approved work plan that included indoor air sampling (and, as already noted, prior sampling results and the extent of contamination at the former CTS facility) may have assisted in obtaining access sooner.

#### **Property Owners Not Meaningfully Engaged in Developing Work Plan**

In the OIG’s opinion, Region 4 did not meaningfully engage the owners of the properties at and near the contaminated springs in developing the 2012 work plan that included air sampling near and under their homes. The work plan did not include prior data collected in the homes and the levels of TCE considered safe as of 2011. The RPM recalled explaining to at least one property owner that an indoor air sample taken in 2008 was above the level considered safe as

of 2011. However, as internal email records show that the RPM did not understand the exceedance until late February 2013, this explanation could not have happened while the work plan was developed, reviewed and approved in 2012.

The approach taken by the region in 2012 in developing the work plan to sample near and under the nearby homes was inconsistent with the EPA's longstanding Superfund directive, "Early and Meaningful Community Involvement,"<sup>6</sup> which calls for the EPA to "get the community more involved in the risk assessment." The approach also was contrary to the five key principles laid out in vapor intrusion guidance:

- Be proactive in engaging the community.
- Listen carefully to what community members are saying.
- Take the time needed to deal with community concerns.
- Change plans where community suggestions have merit.
- Explain to the community what is being done, by whom and why.

During development of the work plan, the region did not engage the owners in determining the scope of the sampling. When the owners of the properties at and near the eastern springs learned that the scope of work did not include sampling inside the homes, as had been done in 2008, they withheld access for investigation activities on their properties. If the region had engaged the property owners in 2012 in development of the air sampling work plan—including a discussion of the data previously collected in the homes and the impact of the 2011 change in the EPA's understanding of the safety of TCE—the owners may have granted access, and sampling could have occurred earlier.

### ***Sampling Too Limited to Characterize TCE Levels Around TCRA Perimeter Fence***

In the OIG's opinion, the sampling conducted in accordance with approved monitoring plans has been too sparse and infrequent to ensure that exposure risks at the perimeter fence surrounding the TCRA system remain acceptable. We conclude this based on our review of EPA guidance,<sup>7</sup> a sample taken of the stream in October 2014, an ambient air sample taken in April 2015, and the system performance in the fall of 2015. In addition, the region does not have an action level for TCE in ambient air near the system, despite approving the reduction of monitoring to ambient air.

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<sup>6</sup> Early and Meaningful Community Involvement, October 12, 2001, EPA OSWER Directive 9230.0-99. Incorporating Citizen Concerns into Superfund Decision-making, January 21, 1991, EPA OSWER Directive 9230.0-18.

<sup>7</sup> Air/Superfund National Technical Guidance Study Series, Volume IV – Guidance for Ambient Air Monitoring at Superfund Sites (Revised), May 1993, EPA-451/R-93-007, states that the minimum number of samples for ambient air sampling is one upwind and three downwind, for a total of four.

## No Regular Monitoring of Stream Leaving TCRA Perimeter

The eastern springs being treated by the TCRA system coalesce to form a stream that flows under the TCRA perimeter fence (see map in Appendix B). When AMEC sampled the stream in October 2014, soon after installing the system, TCE and vinyl chloride were measured at levels that exceeded water quality criterion. Analysis of the risk by the region showed that levels in the stream in October 2014 were not high enough to be of concern for recreational exposure.<sup>8</sup> However, with only one sample taken, one cannot determine whether the sample was representative of the stream quality over time. Previously, the EPA had measured the level of TCE in the springs that feed the stream fluctuating between 1.6 and 36 milligrams per liter. Given this known prior variability, regular, periodic sampling of the stream where it exits the perimeter fence would provide information to the property owners on the safety of the stream that runs through their property, and would be consistent with the work plan.



One-time sampling of ambient air in April 2015 near where the stream flows under the fence that surrounds the removal system. (AMEC photo)

## No Regular Monitoring at Eastern End of TCRA Perimeter

Sampling at the perimeter fence to the east of the TCRA system is not part of the regular, quarterly monitoring of ambient air. AMEC collected one sample in April 2015 near the eastern end of the fence, at the property owner's request. Although the result slightly exceeded the removal-management level for TCE in indoor air, the region did not request that AMEC conduct follow-up. The region told the OIG that the result was not of concern because the sampling location was not near a residence. The level of TCE in the air discharged out of the treatment system in January 2016 was 25 times the removal-management level set for indoor air for acceptable performance of the system. Dispersion and breakdown should decrease the level of TCE, so that the level is lower at the perimeter fence than where the treatment system discharges. However, periodic monitoring is needed to measure the TCE level in air around the perimeter. The addition of sampling ambient air at the eastern end of the fence to the quarterly monitoring plan would provide information to the property owners on the safety of all of their property.

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<sup>8</sup> The region's risk assessor screened the results in 2015 against the National Recommended Water Quality Criteria for human health consumption of water plus organism.

## Changes to the TCRA System in Fall 2015

AMEC enhanced the TCRA system in the fall 2015, after monitoring of air flows in and out of the treatment system and of ambient air at the perimeter showed levels of TCE that were greater than when the system was first installed. AMEC constructed the springs vapor removal and capture system (see Appendix B map) in the fall 2014 to mitigate unsafe levels of TCE in air in the three homes nearest the eastern springs. One home is only 30 feet from the fence that CTS erected around the springs. AMEC collected samples near and in the homes to document that exposure risks in the homes had decreased to acceptable



TCRA system installed to reduce the level of TCE in air near the contaminated springs. (AMEC photo)

levels with the system operating. AMEC also monitored air near and in six homes further from the springs. After the April 2015 sampling showed that levels of TCE were below the action level the region had approved for the TCRA, AMEC ceased in-home sampling and reduced sampling of ambient air near homes. Monitoring of ambient air continued on a quarterly basis at two locations (AAS-05 and AAS-06 on map in Appendix B) along the fence that surrounds the system. AMEC also continued to monitor air flowing out of the treatment system.

Based on the elevated level of TCE measured in air flowing out of the treatment system in August 2015, the RPM told the OIG that he requested sampling in the homes nearest the system (see Appendix B map).



Air sampling canister (red arrow) hung on the perimeter fence to assess the level of TCE in ambient air between the removal system in the background and a home located about 30 feet away. (AMEC photo, modified by OIG)

That sampling showed an elevated level inside the home, located 30 feet south of the fence that surrounds the system. AMEC made changes to the system that included increasing the frequency the treatment carbon was replaced, elevating the stack from which air flows out of the system, moving the stack away from the homes, and installing additional vapor extraction points. Ambient air results collected in January 2016, following the system enhancements, showed that TCE levels had dropped. Ambient monitoring at the two locations (AAS-05 and AAS-06 in the Appendix B map) continues on a quarterly basis. The flow out of the system is sampled about every 2 months prior to AMEC replacing the treatment carbon.

## No Threshold Levels for Ambient Air Monitoring

AMEC recommended eliminating indoor air sampling after the April 2015 sampling showed TCE levels in indoor air were significantly below the established removal management level for indoor air of  $2 \mu\text{g}/\text{m}^3$  (micrograms per cubic meter). However, the region did not formally establish the level in ambient air that would prompt follow-up. This omission became apparent when problems with the system arose and the ambient air results in October 2015 were greater than those measured initially after the system was installed a year earlier.

The RPM told the OIG that if a result at AAS-05 exceeded  $6 \mu\text{g}/\text{m}^3$  and at AAS-06 exceeded  $2 \mu\text{g}/\text{m}^3$ , he would request that AMEC take action. The difference in levels was because residents in the home near AAS-06 belong to a sensitive population. The RPM explained that these are the same action levels he was applying to indoor air sampling. The RPM could not explain why he was applying an action level in the home near AAS-05 that was greater than the removal management level for the TCRA system of  $2 \mu\text{g}/\text{m}^3$  approved by the previous RPM in September 2014. Establishing, in writing, the threshold levels in ambient air and the action levels in indoor air that would prompt follow-up should set clear expectations for the performance of the TCRA system.

### ***Risk of TCE Exposure From Contaminated Springs Not Assessed***

While in 2014 the region took actions under the 2004 AOC to mitigate the exposure to vapors rising from the contaminated springs, the 2012 AOC did not focus on this primary way nearby residents were potentially exposed to harmful levels of TCE and other volatile contaminants in indoor air. By focusing the early air sampling efforts on assessing vapor intrusion, the 2012 AOC took the focus away from the primary air exposure pathway that had been identified from sampling conducted in 2007 and 2008. As a result, the region approved a work plan in 2012 that, in the OIG's opinion, inadequately assessed the risk of exposure to harmful levels of TCE rising off the contaminated springs into ambient air and into nearby homes. Recognizing the source in the 2012 AOC could have helped to have the region elevate the importance of sampling in the homes, and include indoor air sampling in the initial vapor intrusion work plan.

## **Execution of Work Plans Delayed Due to Property Access Problems**

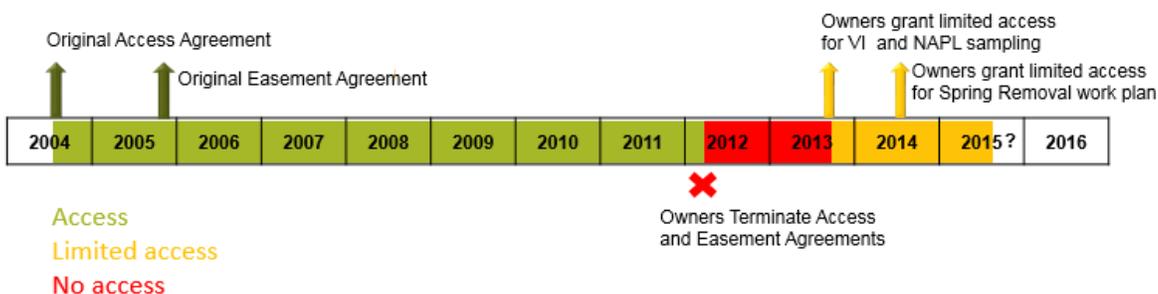
The NAPL and parts of the vapor intrusion investigations were delayed as Region 4 worked to obtain access to private property adjacent to the eastern side of the former CTS facility. The region also chose to delay some sampling activities at locations where it had permission to sample while attempting to obtain access for all of the sampling. As a result of the delays, residents

potentially experienced prolonged exposure to TCE, and EPA and public health costs potentially increased.

### **Access at the Eastern Springs Delayed**

Access to the private properties at and near the eastern springs for parts of the NAPL and vapor intrusion investigations was delayed when the region used its discretion to continue negotiations. The region attempted to gain access to the properties on several occasions by negotiating with the owners. Figure 3 provides a general timeline of access to the private property at the eastern springs, and Appendix C provides further information. However, EPA policy, “Entry and Continued Access under CERCLA,”<sup>9</sup> states that regions should not enter “lengthy”<sup>10</sup> negotiations with property owners over access.

**Figure 3:** Access history for the property at the eastern springs.



Source: OIG analysis of EPA documents.

Although the policy does not define “lengthy,” regional staff believed that negotiations with the owners had been lengthy. After unsuccessful attempts to gain access over a 15-month period, regional staff in June 2013 requested that the then acting Regional Administrator issue a Unilateral Administrative Order to the owners so that the EPA and CTS, as well as EPA and CTS agents, could gain access for sampling. The acting Regional Administrator denied the request to issue the order, and directed staff to continue to seek voluntary access with the owners. The former acting Regional Administrator told the OIG that the decision was based on a variety of factors, including how the public would perceive the EPA taking unilateral action to access private property, and the fact that the former CTS property itself had not been fully characterized. By not issuing a Unilateral Administrative Order or other enforcement instrument, and by continuing

<sup>9</sup> Entry and Continued Access under CERCLA, June 5, 1987, EPA Office of Enforcement and Compliance Monitoring Policy 9829.2.

<sup>10</sup> EPA Region 4 staff told the OIG they interpret whether access negotiations are “lengthy” on a case-by-case basis, depending on such factors as the urgency of the risk to be measured or abated, the length of time during which access will be necessary, how disruptive the work will be to the property owner’s usual use of the property, and the overall scope and duration of the response action.

negotiations to obtain voluntary access, in the OIG's opinion, the region did not follow EPA policy that directed the EPA to not engage in lengthy negotiations.

The property access issues delayed sampling and monitoring at and near the eastern springs for 18 months.<sup>11</sup> The quarterly monitoring of contaminant levels in the springs was not conducted for two-and-a-half years, and air sampling that took place on property to the west in October 2012 was not conducted on the eastern properties. Starting in October 2013, the property owners signed several access agreements for specific sampling or cleanup activities. However, none extended beyond September 2015. Since then, the EPA and CTS, as well as EPA and CTS agents, have accessed the properties with verbal approval from the owners.

### ***EPA Region 4 Chose to Delay Investigations***

In 2012 and 2013, EPA Region 4 chose to delay the start of the NAPL investigation, not take a scheduled air sample near the contaminated eastern springs, and stop quarterly sampling of the springs. The region made these choices while negotiating access agreements needed to complete some of the sampling described in the NAPL and vapor intrusion work plans. However, sampling could have proceeded where agreements were in place, such as on the former CTS facility property. As a result of its decisions to delay, the region did not have results on the extent of NAPL under the former facility (Figure 4, next page) that it could have used to demonstrate to the owners of the properties to the east the need to continue the subsurface investigation onto their properties.

The region also had no information—collected after the safety of TCE had been reassessed—on levels of TCE in air near the springs. In the OIG's opinion, a single sample of ambient air taken at the eastern springs—if it had shown that the level of TCE remained high—should have motivated the region to act with greater urgency to mitigate the air contaminants rising from the springs. Earlier action would have reduced the amount of time nearby residents were exposed to potentially unsafe levels of TCE in air in their homes.

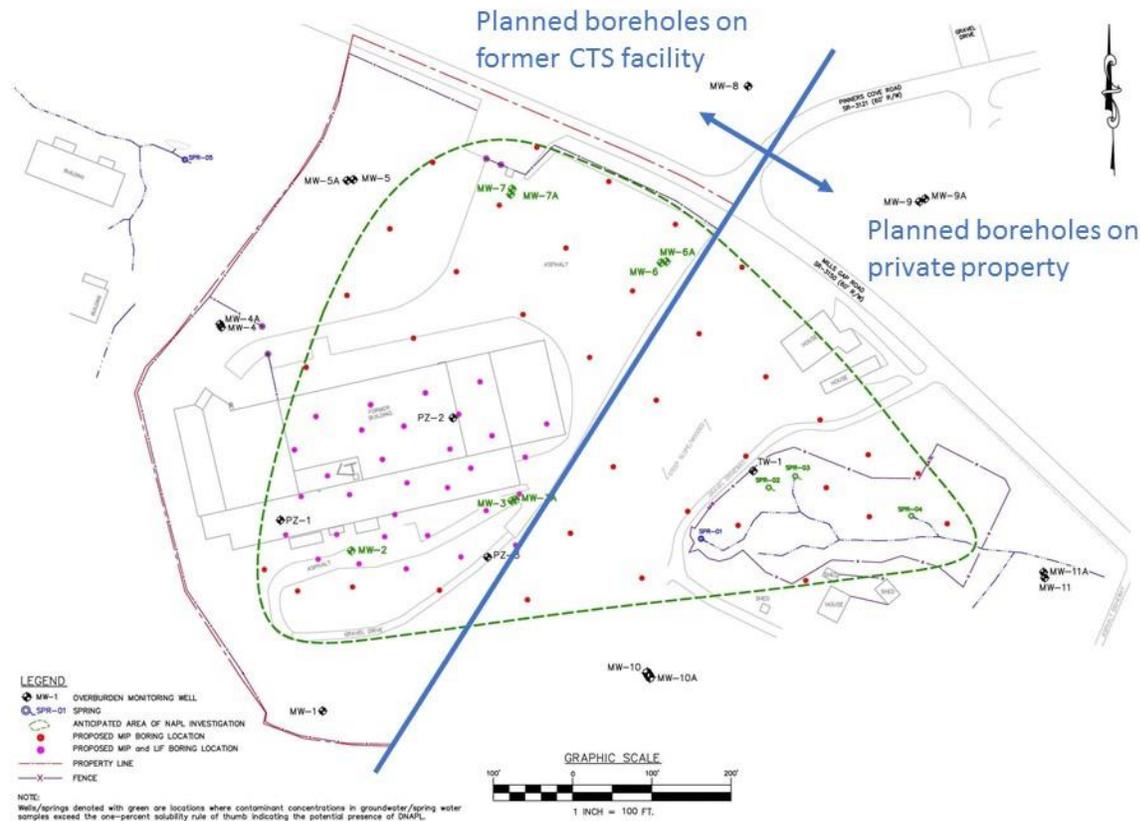
Not having early information from these two investigations was a missed opportunity to negotiate effectively for access to the eastern properties. Additional effects from delayed investigations include a) CTS and AMEC not having data on how TCE in the contaminated springs had varied over the previous 2 years, to inform their design of the TCRA, and b) EPA and public health costs potentially increasing.

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<sup>11</sup> In March 2012, the property owners took steps to terminate previous access agreements, and the EPA chose to not sample without new agreements in place. In September 2013—18 months later—the owners allowed AMEC to measure water levels on their property.



**Figure 4:** NAPL investigation boreholes on the former CTS facility and private property, as planned in the fall of 2012. Map shows that the majority of boreholes (red and purple symbols) were planned for the former CTS facility.



Source: EPA-approved work plan, as modified by the OIG to show planned boreholes on the former CTS facility and on private property.

## Communication Efforts for Sampling Work Plans Not Always Effective

We found that EPA Region 4’s communication efforts related to sampling work plans were not effective in two ways. Previously, the region had written to the resident that the level of TCE measured inside his home in 2008 was safe. The region did not notify the owners or resident in writing that the region’s reassessment showed that the level of TCE measured inside their home in 2008 exceeded the level of TCE the region considered safe as of September 2011. The region asserts that the RPM explained this reassessment to one owner in person. However, the lack of written communication may have contributed to the delay in obtaining access to collect samples.

Also, the region did not call for CTS to construct a conceptual site model to effectively communicate to the community what was known and unknown about the distribution of contaminants at the site. A conceptual site model can facilitate greater understanding of site risks and conditions, and promote community member participation in the cleanup process, thus facilitating earlier access to

private property. While the sitewide model the region developed in February 2015 is helpful, appropriately scaled sub-models focused on vapor and other exposure pathways have yet to be developed.

## Conclusions

The region missed opportunities to expedite some of the investigations that lead to cleanup. By delaying investigations, the region potentially prolonged exposure to unsafe levels of TCE, and also may have increased EPA and public health costs. The region could have more clearly communicated risks and meaningfully engaged the community, which may have changed nearby property owners' positions and enabled earlier action to protect public health. Ongoing updates of the conceptual site model may necessitate review of work plans that are being executed, and should be considered in the development of future work plans.

## Recommendations

We recommend that the Regional Administrator, Region 4:

1. Develop and implement management controls to make work plans for the CTS site consistent with objectives in Administrative Settlement Agreements and Orders on Consent and other enforceable documents, and to publicly document decisions to approve work plans that deviate from or only partly address objectives.
2. Meaningfully engage the community in the development of investigation plans, understanding the investigation results, and deciding cleanup approaches.
3. Direct that sampling at and near the contaminated eastern springs is comprehensive enough to assess all potential exposure pathways, including vapor intrusion, and to monitor the full effects of the time-critical removal action system on ambient air around the perimeter fence and the stream flowing under the fence.
4. Establish threshold levels for the ambient air monitoring around the perimeter fence of the time-critical removal action system that would prompt action if exceeded.
5. Related to the conceptual site model:
  - a. Develop, or require CTS to develop, a model focused on vapor exposure pathways before accepting any additional work products related to the vapor exposure pathways. This vapor-focused model should be a subset of, and consistent with, the sitewide model the region created in February 2015.

- b. Review any previously approved work plans in the process of being implemented, particularly work plans related to vapor exposure pathways, in the context of the updated model, and revise those plans as needed.
  - c. Develop and implement a plan for (1) updating the models that, together, comprise the conceptual site model, as new information on site conditions is obtained; (2) incorporating those updated models into new work and action plans; and (3) using the conceptual site model to better engage the community in the site investigation and cleanup work.
- 6. Adhere to EPA guidance and policy and use appropriate enforcement tools to ensure access to private properties needed to conduct investigation and cleanup activities.
  - 7. Require CTS to proceed with approved work where it has access.

We also recommend that the Assistant Administrator for Enforcement and Compliance Assurance:

- 8. Establish the criteria regions should consider when determining that access negotiations have been “lengthy” in the context of the Entry and Continued Access under Comprehensive Environmental Response, Compensation, and Liability Act policy; and other factors the regions should consider, in addition to length of negotiations, in choosing to delay implementing the enforcement alternatives of this policy.

## **Summary of Agency Response to Draft Report and OIG Evaluation**

The agency provided its response on July 21, 2016. OIG and agency officials and staff met on July 26, 2016, to discuss the response. The full text of the agency’s written response and the OIG’s evaluation are in Appendix D. Where appropriate, the OIG revised its report based on the agency response and meeting.

The agency stated it did not concur with Recommendations 1, 3, 4 and 8, but did concur with Recommendations 2, 5, 6 and 7. The OIG agreed to the agency’s proposed or completed corrective actions for Recommendation 4, 6, 7 and 8, as well as a part of Recommendation 5; these are considered resolved. Due to remaining differences, Recommendations 1, 2 and 3, as well as parts of Recommendation 5, are considered unresolved with resolution efforts in progress.

## Chapter 3

### Improvements in Communication and Sitewide Work Needed to Advance and Integrate Investigations and Cleanup

Although EPA Region 4 communicated milestones, and its communication efforts met EPA's requirements, improvements in communication are needed to quicken the pace of investigative work and advance investigations and cleanup. Regional staff spent significant time responding to information requests from community members, and the region could better manage its communication work by effectively developing and using online resources. Community members expressed concern about the difficulty of obtaining site information, and the RPM had less time to devote to managing the cleanup due to high communication demands. The region identified and implemented some efficiencies to accelerate the pace of portions of the cleanup and to protect human health. Specifically, the region:

- Used an enforcement instrument already in place—the 2004 AOC—to quickly initiate a removal action in 2014 to address unsafe conditions at the eastern springs.
- Used an existing quality plan for the focused feasibility study of the shallow source of contaminants to groundwater near the former facility, instead of preparing a new quality plan.
- Approved an interim cleanup action to remediate shallow NAPL contamination and the nearby groundwater contaminated by the NAPL.
- Began investigating the extent of groundwater contamination to the west of the former facility, including quarterly sampling of ambient air near the western springs.

However, the region missed the opportunity to integrate the focused investigative and cleanup efforts to prepare for sitewide cleanup by delaying the start of the sitewide investigation.

#### EPA Set Investigation and Cleanup Schedules

The region developed a general investigation and cleanup schedule, and milestones for several phases of the work being performed at the site. For example, the region included a table, *Projected Future Activities and Schedule*, in two community updates it distributed. The last was distributed in December 2014 (Figure 5) and

**Figure 5:** General investigation and cleanup schedule distributed by EPA Region 4 in its community update in December 2014.

Projected Future Activities and Schedule	
Date	Activity
January 5-9, 2015	Begin field work for NAPL Area Focused Feasibility Study: monitoring well sampling
January 12-16, 2015	Quarterly private well water sampling
January 12-16, 2015	Quarterly air sampling
January 19-23, 2015	Zebra Environmental scheduled to arrive on site to perform Geoprobe work related to the NAPL Area FFS
February – April 2015	Field work continues for NAPL Area FFS
April 2015	Quarterly well water sampling
April 2015	Quarterly air sampling
Summer 2015	Begin site-wide RI/FS for media not already addressed.
July 2015	Quarterly well water sampling
Fall 2015	Complete a Focused Feasibility Study (technology evaluation) for actions to remediate NAPL contamination.
October 2015	Quarterly well water sampling
Winter 2015	Complete public participation and issue a Record of Decision (selection of remedy) for NAPL. Issue Notice Letters to begin enforcement process.
Fall 2016	Complete enforcement and begin design/construction of interim action remedy for NAPL remediation.
Winter 2016	Complete construction of the NAPL remedy (could be sooner or later depending on the technology selected). This constructed remedy may then have to be operated for months or years before completion.
Winter 2016	Finalize/approve the site-wide RI/FS, complete public participation and issue Record of Decision for site-wide remedy. Issue Notice Letters to begin enforcement process.
Summer/Fall 2017	Complete enforcement and begin design/construction of site-wide remedy.
Summer/Fall 2018	Complete construction of site-wide remedy (could be sooner depending on the technology selected). This constructed remedy may then have to be operated for numerous years before cleanup can be declared "complete" based on achieving cleanup levels in ground water.

\* Dependent upon the success of the removal action, once ambient and indoor air levels have been reduced and are within the acceptable risk range, the displaced residents will be notified that relocation is no longer necessary.

Source: The EPA.

provided a general schedule through construction of a sitewide remedy, anticipated in 2018. However, the region did not provide this general schedule in its more recent community update. The June 2015 community update included information on next steps in its short description of each individual investigation or action, but did not provide a sitewide overview. Work plans for specific actions and investigations—such as the springs removal action and NAPL-focused feasibility study—also included milestones and schedules for monitoring or other next steps. However, those do not present a sitewide overview. Updating and including the *Projected Future Activities and Schedule* table would be a good practice for the region to adopt for every community update it distributes.

## EPA Met Communication Requirements

The region completed all of the communication requirements in accordance with the *Superfund Community Involvement Handbook*. The following activities are required and were completed prior to, or during, the early phase of the ongoing remedial investigation/feasibility study:

- Conduct community interviews.
- Prepare a formal community involvement plan.
- Establish the administrative record.
- Establish and maintain an information repository.
- Issue public notice of information repository.
- Publish notice of technical assistance grants.

In addition, the region completed some recommended—but not required—community involvement activities, including distributing periodic community updates and fact sheets, making presentations to local officials and civic groups, holding public availability sessions, and establishing a telephone hotline. The community involvement coordinator, most notably, maintained an extensive list of email addresses for community members and others interested in the site. The region periodically sent updates and documents to this list. According to the region, it will continue to distribute updates to this list.

## Web Pages Included Out-of-Date Status and Limited Site Information

The region did not provide current site status, and had limited site information available online on EPA web pages when we started our review. This was in spite of having three public, site-specific web pages—the national [Superfund Site Profile](#) page, an [on-scene coordinator](#) page, and a region-maintained page.<sup>12</sup> The now-former RPM and other regional staff responded to community member requests for site information, resulting in the region spending a large amount of time on communication. This also impacted the amount of time the RPM had to devote to managing the site cleanup.

In June 2014, the region publicly stated its intention to provide frequently requested documents online. During the course of our review, the region struggled to meet this commitment. The region added some documents to its region-maintained web page, but in October 2015 the region-maintained web page was eliminated and users were directed to the re-formatted Superfund Site Profile page. This was done in an effort to offer Superfund site information in a consistent manner nationwide. The region effectively used this profile page to make available to the public the administrative record for the proposed interim remedial action during the public comment period. However, since the interim record of decision was signed, the documents that form the administrative record were removed from the web page. The RPM told the OIG that these documents were removed because they were not in a form that fully complied with standards. Pollution reports for recent and ongoing removal actions and frequently requested site documents—such as work plans and investigation reports—for the most part are not available. In addition, the site status has not been completely updated on the profile and on-scene coordinator pages.

### ***Pollution Reports***

Pollution reports are not available on the EPA’s public site-specific on-scene coordinator web page for the emergency relocation conducted in 2014, and for the ongoing removal action at the eastern springs. This type of report is meant to describe removal activities to EPA management. Although there is no requirement to make the report available to the public, the first nine pollution reports prepared for this site are available. The region also has not updated the public on-scene coordinator web page to include the site’s status as a Superfund site, and does not include current contact information.

Region 4 asserted that once the site was placed on the National Priorities List, it was no longer appropriate to use the public on-scene coordinator web page as an online resource to update the community. To maintain clear and transparent communication, the region should, at a minimum, include on the public on-scene

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<sup>12</sup> Of the EPA’s three site-specific web pages for the CTS of Asheville Superfund site, only two remain active. The third page—the region’s page—redirects users to the national Superfund Site Profile page.

coordinator web page the site's Superfund status, current contact information, and a link to the Superfund Site Profile page where new information is posted.

### ***Frequently Requested Documents, Work Plans, Investigation Reports and Cleanup Records***

At a June 23, 2014, meeting attended by the media, EPA regional representatives and North Carolina Department of Public Health personnel, the region committed to providing frequently requested documents online. Documents that would inform the community include the community involvement plan, periodic community updates, historical and current work plans, sampling schedules, result reports, action plans, pollution reports, and administrative records and orders. After the OIG inquired about the status of the region's commitment, in March 2015, the region updated its site-specific web page to provide some documents.

Due to the elimination of the region's site-specific web page and redirection to the newly formatted national Superfund Site Profile page in October 2015, documents that were previously available online were no longer available. As of April 2016, only three recent Superfund documents were available on the profile page:

- The AOC signed by the region and CTS in 2012 for the remedial investigation/feasibility study.
- The National Priorities List narrative from 2012.
- The 2016 interim record of decision for remedial action.

Also available are five documents (two from 1991 and three from 1999) that comprised an administrative record for removal action established in 2007.

The general lack of site reports available online shows that the region has not met its commitment to provide documents online. Also, information on the current status of removal and remedial work at the site is lacking on the newly formatted profile page.

## **Sitewide Remedial Investigation/Feasibility Study Delayed**

While the region has compelled CTS to undertake the priority work set out in the 2012 AOC and some other investigations, the region has allowed CTS to delay starting the sitewide remedial investigation/feasibility study. The 2012 AOC specified that CTS was to submit its work plan for the sitewide remedial investigation/feasibility study 6 months after signing the AOC. Near that July 2012 deadline, AMEC requested an extension on CTS's behalf, and the region granted an open-ended extension to allow AMEC to focus on the priority activities specified in the AOC. This extension continued into 2016 due to the unanticipated need to conduct the removal action at the eastern springs, and the region's decision to focus on early action to mitigate the shallow NAPL contamination. In addition, in March 2015, the region requested that AMEC

expedite characterization work on private property to the west of the former facility.

While each of these focused efforts was needed, the region's choice to delay starting the sitewide remedial investigation/feasibility study means that parts of the needed investigations are not taking place. For example, the extent of contaminants deep in the groundwater that flows through fractured bedrock under the former facility has not been investigated fully. The region told the OIG that the sitewide cleanup decision is not expected for several years, to allow time for the effects of the interim remedial action to fully develop. However, the region suggested in its 2015 conceptual site model that NAPL already had moved into the fractured bedrock underlying the shallower zone that will be addressed with the action approved in the interim remedial action record of decision.

Also, regular, sitewide hydrologic monitoring is not taking place. The region specified in the interim record of decision that it will implement a bedrock monitoring program. This is a good step. However, sitewide monitoring would provide information needed to integrate the results from the individual, focused efforts. Initiating a sitewide monitoring program does not need to wait for implementation of a complete, complex sitewide remedial investigation/feasibility study.

In its December 2014 update to the community, the region estimated approval of the sitewide remedial investigation/feasibility study work plan in late 2016 to early 2017. This is more than 4 years after the date specified in the 2012 AOC. At the appropriate time, the region will obtain public input on the sitewide remedy.

## **Conclusions**

Improving communication will sustain commitments the region made to the community. Increasing on-line availability of site information may also reduce time spent by regional personnel responding to requests for information, and enable the region to reallocate this time to site cleanup activities. In addition, if the region would regularly update the community on its projected schedule, those updates may assist in advancing investigation and cleanup activities.

The region identified and implemented some efficiencies to quicken the pace of site cleanup. However, by delaying the start of the sitewide remedial investigation/feasibility study, the region missed opportunities to investigate the contaminants in the deep fractured bedrock, and to integrate the focused investigative and cleanup efforts to prepare for sitewide cleanup.



## Recommendations

We recommend that the Regional Administrator, Region 4:

9. Include an updated table of *Projected Future Activities and Schedules* with each community update.
10. Close out the site-specific on-scene coordinator web page by adding information on the site's Superfund status, updating the contact information, and providing a link to the Superfund Site Profile web page where new information will be posted.
11. Add documents to the EPA's Superfund Site Profile web page for the site, including:
  - a. Status of removal and remedial activities.
  - b. The 2016 community involvement plan and community updates.
  - c. Frequently requested documents, including recent and historical work plans, sampling schedules, result reports and action plans.
  - d. Pollution reports for removal actions conducted since 2012 and a link to older reports on the on-scene coordinator web page.
  - e. Administrative records for removal and remedial actions.
  - f. Other site documents as appropriate to support removal and remedial site actions and activities.
12. Develop and implement sitewide hydrologic and water-quality monitoring that will integrate the planned monitoring of the fractured bedrock; the ongoing monitoring of wells used for drinking water, the removal action system at the eastern springs, and ambient air at the western springs; and the yet-to-be designed and implemented monitoring for the interim remedial action.

## Summary of Agency Response to Draft Report and OIG Evaluation

The agency provided its response on July 21, 2016. OIG and agency officials and staff met to discuss the response on July 26, 2016. The agency concurred with Recommendations 9 through 12, and these recommendations are considered resolved. The agency's full written response and the OIG's evaluation are in Appendix D.

# **Status of Recommendations and Potential Monetary Benefits**

## RECOMMENDATIONS

Rec. No.	Page No.	Subject	Status <sup>1</sup>	Action Official	Planned Completion Date	Potential Monetary Benefits (in \$000s)
1	21	Develop and implement management controls to make work plans for the CTS site consistent with objectives in Administrative Settlement Agreements and Orders on Consent and other enforceable documents, and to publicly document decisions to approve work plans that deviate from or only partly address objectives.	U	Regional Administrator, Region 4		
2	21	Meaningfully engage the community in the development of investigation plans, understanding the investigation results, and deciding cleanup approaches.	U	Regional Administrator, Region 4		
3	21	Direct that sampling at and near the contaminated eastern springs is comprehensive enough to assess all potential exposure pathways, including vapor intrusion, and to monitor the full effects of the time-critical removal action system on ambient air around the perimeter fence and the stream flowing under the fence.	U	Regional Administrator, Region 4		
4	21	Establish threshold levels for the ambient air monitoring around the perimeter fence of the time-critical removal action system that would prompt action if exceeded.	C	Regional Administrator, Region 4	7/21/16	
5	21	Related to the conceptual site model: <ul style="list-style-type: none"> <li>a. Develop, or require CTS to develop, a model focused on vapor exposure pathways before accepting any additional work products related to the vapor exposure pathways. This vapor-focused model should be a subset of, and consistent with, the sitewide model the region created in February 2015.</li> <li>b. Review any previously approved work plans in the process of being implemented, particularly work plans related to vapor exposure pathways, in the context of the updated model, and revise those plans as needed.</li> <li>c. Develop and implement a plan for (1) updating the models that, together, comprise the conceptual site model, as new information on site conditions is obtained; (2) incorporating those updated models into new work and action plans; and (3) using the conceptual site model to better engage the community in the site investigation and cleanup work.</li> </ul>	O	Regional Administrator, Region 4	12/31/16	
6	22	Adhere to EPA guidance and policy and use appropriate enforcement tools to ensure access to private properties needed to conduct investigation and cleanup activities.	C	Regional Administrator, Region 4	7/21/16	
7	22	Require CTS to proceed with approved work where it has access.	C	Regional Administrator, Region 4	7/21/16	
8	22	Establish the criteria regions should consider when determining that access negotiations have been "lengthy" in the context of the Entry and Continued Access under Comprehensive Environmental Response, Compensation, and Liability Act policy; and other factors the regions should consider, in addition to length of negotiations, in choosing to delay implementing the enforcement alternatives of this policy.	O	Assistant Administrator for Enforcement and Compliance Assurance	10/1/16	

**RECOMMENDATIONS**

Rec. No.	Page No.	Subject	Status <sup>1</sup>	Action Official	Planned Completion Date	Potential Monetary Benefits (in \$000s)
9	28	Include an updated table of <i>Projected Future Activities and Schedules</i> with each community update.	O	Regional Administrator, Region 4	12/31/16	
10	28	Close out the site-specific on-scene coordinator web page by adding information on the site's Superfund status, updating the contact information, and providing a link to the Superfund Site Profile web page where new information will be posted.	O	Regional Administrator, Region 4	12/31/16	
11	28	Add documents to the EPA's Superfund Site Profile web page for the site, including:				
		a. Status of removal and remedial activities.	O	Regional Administrator, Region 4	12/31/16	
		b. The 2016 community involvement plan and community updates.	O	Regional Administrator, Region 4	12/31/16	
		c. Frequently requested documents, including recent and historical work plans, sampling schedules, result reports and action plans.	O	Regional Administrator, Region 4	12/31/16	
		d. Pollution reports for removal actions conducted since 2012 and a link to older reports on the on-scene coordinator web page.	O	Regional Administrator, Region 4	12/31/16	
		e. Administrative records for removal and remedial actions.	O	Regional Administrator, Region 4	12/31/16	
		f. Other site documents as appropriate to support removal and remedial site actions and activities.	O	Regional Administrator, Region 4	12/31/16	
12	28	Develop and implement sitewide hydrologic and water-quality monitoring that will integrate the planned monitoring of the fractured bedrock; the ongoing monitoring of wells used for drinking water, the removal action system at the eastern springs, and ambient air at the western springs; and the yet-to-be designed and implemented monitoring for the interim remedial action.	O	Regional Administrator, Region 4	6/30/17	

<sup>1</sup> O = Recommendation is open with agreed-to corrective actions pending.  
 C = Recommendation is closed with all agreed-to actions completed.  
 U = Recommendation is unresolved with resolution efforts in progress.

## ***Prior OIG Reports Related to CTS of Asheville Site***

**Congressionally Requested Inquiry into EPA's Response to a Report of a Leaking Well in North Carolina and the National Response Center Hotline**, Report No. [10-P-0027](#), issued November 10, 2009

In response to a congressional request, the OIG examined the EPA's receipt and disposition of a telephone call reporting a well leaking contaminated water. We concluded that EPA staff provided a timely and effective response to the leaking well near the site. We made no recommendations.

**EPA Activities Provide Limited Assurance of the Extent of Contamination and Risk at a North Carolina Hazardous Waste Site**, Report No. [10-P-0130](#), issued May 17, 2010

In response to a congressional request, the OIG examined the quality of EPA water and air sampling at the site. We also reviewed whether the EPA clearly communicated sampling results to residents. We found that:

- Region 4's oversight and administration of drinking water sampling was limited.
- Region 4's assessment of air quality identified a need for monitoring and response action at contaminated springs.
- Region 4 is completing removal action, but site risks remain.
- Region 4's letters to affected residents communicating water and air sample results contained jargon and technical language, did not clearly communicate safety issues, and could have been misleading to some.
- Recordkeeping practices did not satisfy EPA requirements.
- The community involvement plan did not address current site activities.

We made six recommendations. According to the agency's tracking systems, all corrective actions are complete.

**EPA Has Implemented Corrective Actions to Improve Conditions at Asheville, North Carolina Superfund Site**, Report No. [12-P-0362](#), issued March 21, 2012

The OIG conducted this evaluation to determine whether EPA Region 4 implemented agreed-to actions in response to the 2010 OIG report. We found that the region needed to complete further action to meet the intent of two of the recommendations:

- The fact sheet being sent to residents with the results of the sampling of their drinking water did not conform to the region's standard operating procedures.
- The community involvement plan did not include a specific communication strategy and did not reflect the site's new Superfund status.

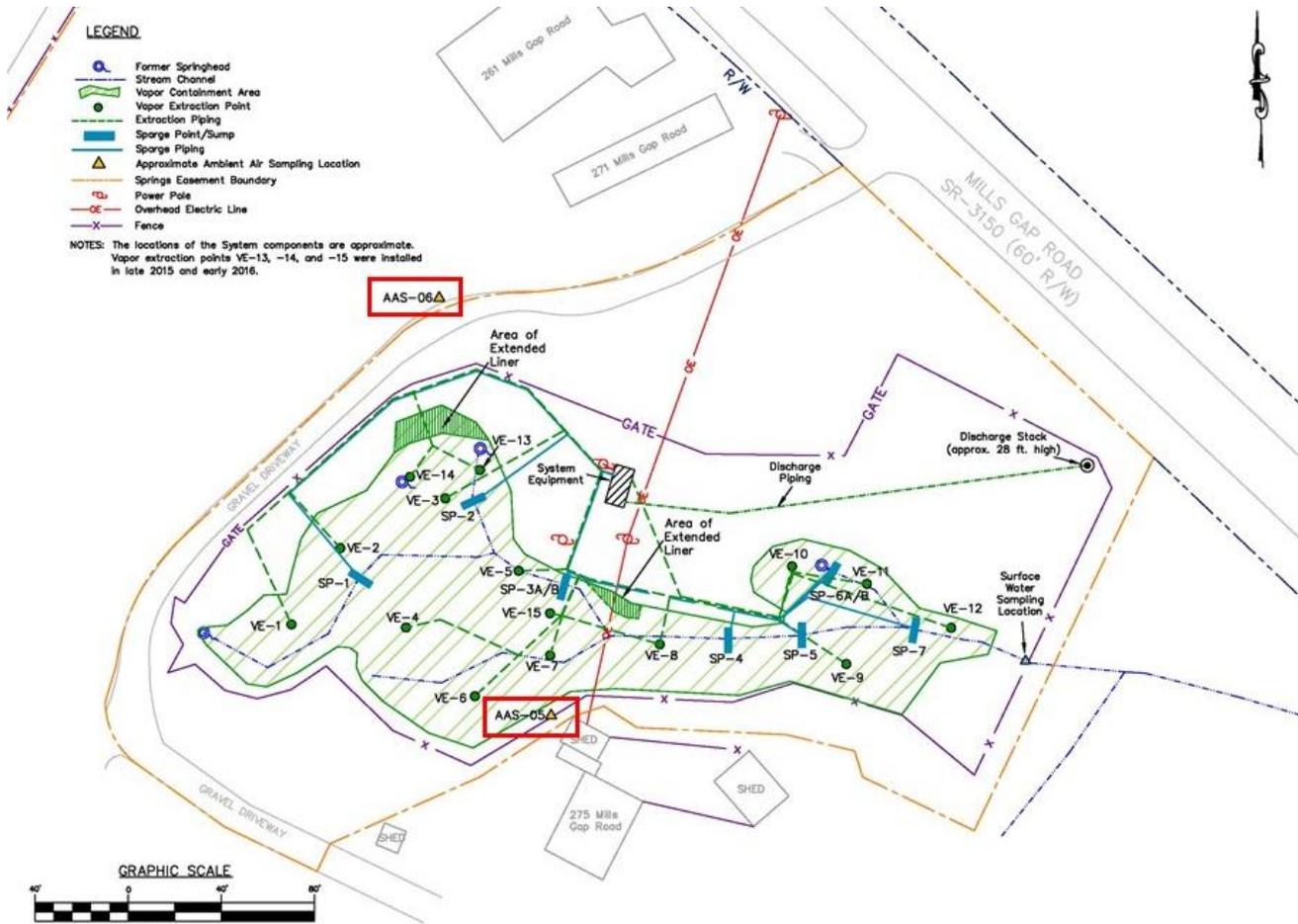
Three additional issues came to OIG's attention during this review:

- The region did not have controls in place to ensure the site's public informational repository is being kept up to date and maintained.
- The region did not complete a report on a removal action pilot study, nor provide a fact sheet to the community on the results as planned.
- The region did not timely bill responsible parties approximately \$175,000 in federal government costs incurred at the site; this billing lapse was an oversight and has since been corrected.

We made four recommendations. According to the agency's tracking systems, all corrective actions are complete.

# Map of Springs Vapor Removal and Capture System

System installed in 2014 to mitigate the unsafe levels of TCE in air near the contaminated eastern springs and modified in the fall of 2015.



Source: AMEC report to EPA, modified by OIG.

## ***Narrative Site Access Timeline***

<b>June 2004</b>	The property owners of the eastern springs signed an access agreement with CTS for drilling wells and collecting samples.
<b>November 2005</b>	The property owners of the eastern springs signed an easement agreement with CTS granting CTS and its agents exclusive easement to the area around the springs for remediation work and access to the easement area from the road.
<b>March 2012</b>	The property owners of the eastern springs notarized a document stating that they were terminating and exercising their rights to terminate the easement.
<b>April and September 2012</b>	CTS sent the property owners letters stating that both the access agreement and easement were still in effect and access denial would be in breach of these agreements.
<b>August and October 2012</b>	The property owners of the eastern springs denied attempts to access the property.
<b>December 2012</b>	CTS's attorney sent letters to the property owners at and near the eastern springs requesting access to perform the work required by the vapor intrusion assessment and NAPL investigation work plans. The letter requested signatures and return of a form acknowledging that the property owners would allow access and would not interfere with the performance of the work. This form was not returned.
<b>April-June 2013</b>	An EPA attorney and the attorney for the property owners of the eastern springs discussed possible revisions and clarification to the access agreement.
<b>October – November 2013</b>	The property owners at and near the eastern springs granted limited access for the vapor intrusion assessment and NAPL investigation.
<b>September 2014</b>	The property owners of the eastern springs granted limited access for the spring vapor removal work plan to begin.

## ***Agency Response to Draft Report and OIG Evaluation***

July 21, 2016

### **MEMORANDUM**

**SUBJECT:** Response to Draft Report:  
Progress Made, But Improvements Needed at the CTS of Asheville Superfund  
Site in North Carolina to Advance Cleanup Pace and Reduce Exposure  
Project No. OPE-FY14-0044

**FROM:** Heather McTeer Toney, Regional Administrator  
U.S. EPA Region 4

**TO:** Carolyn Copper, Assistant Inspector General  
U.S. EPA Office of Program Evaluation

EPA Region 4 appreciates the opportunity to respond to the draft report. As requested in your June 15, 2016, memorandum, please find the attached response from Region 4 to the subject draft report. The attached response is divided into two sections: A) Factual Accuracy of Draft Report and B) Region 4's Response to Recommendations. As a separate attachment you will find the EPA Office of Enforcement and Compliance Assurance (OECA) Response to Recommendations.

As noted in the Region 4 February 8, 2016, response, the report does not accurately reflect that Region 4 adhered to applicable national guidance and site specific data in applying a step-wise, risk-based priority approach to undertaking the work at the site. The conclusion in the draft report is based on misinterpretation of the applicable guidance and procedures and mischaracterizes the potential for exposure risks to residents living near the springs east of the site.

Based on the above, Region 4 does not concur with several of the report's recommendations. Region 4 notes several areas where we concur with the OIG's recommendation and intend to begin implementation as soon as possible (in many cases, immediately).

## A. FACTUAL ACCURACY OF DRAFT REPORT

The following comments are presented chronologically as they appear in the draft report. In general, the responses are organized by: Chapter/Section/Page - Remark.

1. **At a Glance/Report Title** The report title “*Progress Made, But Improvements Needed...to Reduce Exposure*” is inaccurate and may create a false impression in the community of existing exposure. Region 4 placed a priority on eliminating the two potential human exposure pathways to TCE: drinking water and air. Those two potential exposure pathways have been effectively mitigated via the installation of filtration systems on private wells by CTS, extension of public water lines by Buncombe County, and construction of the eastern springs vapor removal and treatment system. Region 4 asks that the OIG remove any implication in this report that people are still exposed to contamination above risk thresholds at this site, or at least that the title be revised to state “*potential exposure.*” This change should be made throughout the draft report.

**OIG Response 1:** The OIG agreed and added the word “potential.”

2. **At a Glance/Text Box “Why We Did This Review”** This text box states “*EPA moved residents from three homes near the CTS of Asheville Superfund site in North Carolina because of unsafe levels of cancer-causing chemical TCE.....*” Relocation was based on potential non-cancer impacts to a woman of child bearing age, not cancer risks.

**OIG Response 2:** The OIG agreed and changed “cancer-causing” to “harmful.”

3. **At a Glance/Text Box “Why We Did This Review”** Site was placed on the National Priorities List (NPL) in March 2012, not April 2012.

**OIG Response 3:** The effective date listed in the Federal Register for the addition of CTS of Asheville to the National Priorities List was April 15, 2012. The OIG changed “in” to “effective.”

4. **At a Glance/What We Found** Region 4 believes the bullet “*Monitoring was too limited to characterize TCE around the vapor removal system perimeter fence*” is not supported by available data. Further details are provided below under Chapter 2/Sampling Too Limited to Characterize TCE Levels Around TCRA Perimeter Fence.

**OIG Response 4:** The OIG disagrees. It is the OIG’s opinion that monitoring was too limited, as AMEC measured TCE in the air and in the stream only once at the eastern end of the perimeter fence since the remediation system became operational.

5. **Chapter 1/Table 1/Page 2** The term “evaporates/evaporation” is used improperly in this context. Region 4 recommends using “volatilizes/volatilization” of TCE.



**OIG Response 5:** In the July 26, 2016, meeting, the region clarified that it uses “evaporate” related to the conversion of water to vapor, and volatilize related to the conversion of TCE to vapor. However, the U.S. Department of Health and Human Services’ Agency for Toxic Substances and Disease Registry uses the term “evaporate” in its public information of the health impacts of TCE. Thus, the OIG retained the language used by the Agency for Toxic Substances and Disease Registry.

6. **Chapter 1/Early Actions to Assess and Clean Up the Site/Page 3** Site was added to the NPL in March 2012, not April 2012.

**OIG Response 6:** See OIG Response 3.

7. **Chapter 1/Footnote 2/Page 6** The footnote states that vapor intrusion guidelines issued by the Interstate Technology Regulatory Council (ITRC) in 2007 “applied to the vapor intrusion assessment work plan” developed by CTS in 2012 and “established requirements and procedures” for Region 4’s efforts at the CTS site. While the ITRC guideline may serve as reference material on various tools available as of 2007 for investigation, it does not establish specific requirements and procedures for EPA or any other party at any Superfund site, including the CTS site.

**OIG Response 7:** The OIG amended footnotes 2 and 3 of the draft (footnotes 2 and 4 in the final report).

8. **Chapter 1/Table 2/Page 6** Region 4 asserts that planning and completing the Western Area Remedial Investigation (RI) Report should be listed as an outcome at the CTS site since 2012.

**OIG Response 8:** The OIG agrees that the western area remedial investigation should be included in Table 2. However, the OIG disagrees that it is an outcome. We added information on the activity side of Table 2.

9. **Chapter 1/Noteworthy Achievements/Page 7** Region 4 asserts that completion of the Western Area RI should be listed as a noteworthy accomplishment. EPA expedited this work as part of the site-wide RI/Feasibility Study effort, and the results delineated the extent of TCE in the overburden aquifer, sediment, surface water and ambient air on the western side of the CTS plant site.

Region 4 also asserts that the OIG description of the Interim Remedial Action selected by EPA in the February 2016 Record of Decision (ROD) is understated. The expanded source control cleanup that EPA pushed for, and that the community fully supported, increased the area to be treated three-fold from one acre to three acres, while the volume addressed increased five-fold from 40,000 cubic yards (CYs) to > 200,000 CYs. The expanded source control cleanup selected by Region 4 is estimated at \$8.9 Million, more than double the amount of work initially proposed by CTS.

**OIG Response 9:** The OIG agrees and added information on the increase in treatment area and estimated cost.

10. **Chapter 2/Introduction Paragraph/Top of Page 9** Region 4 asserts that the bullet “*Monitoring was too limited to characterize TCE around the vapor removal system perimeter fence*” is not supported by available data. Further details are provided below under Chapter 2/Sampling Too Limited to Characterize TCE Levels Around TCRA Perimeter Fence.

**OIG Response 10a:** See OIG Response 4.

Moreover, Region 4 strongly objects to the OIG statement “...residents living near the contaminated eastern springs could have been exposed for a longer time to unsafe levels of TCE in the air in their homes.” Region 4 diligently attempted to gain access from the property owner to collect air samples from the eastern spring’s area. On numerous occasions the RPM and CIC met, in person, with the property owner to explain (1) the potential risks associated with exposure to TCE in air, (2) the mechanics of vapor intrusion and volatilization of TCE from surface water, and (3) EPA’s vapor intrusion guidance and how that affected sampling methodology and sequencing. On several occasions the property owner was accompanied by representatives she chose to assist her in understanding the material the Region was presenting. Despite these efforts, Region 4 was repeatedly denied permission to collect air samples from this property.

**OIG Response 10b:** The OIG statement that “...residents living near the contaminated eastern springs could have been exposed for a longer time to unsafe levels of TCE in the air in their homes” is true. The OIG made no changes in response to this comment.

11. **Chapter 2/Problems With Some Plans and Work Conducted Hampered Progress/page 9**

Region 4 disagrees with several portions of the introductory paragraph to this section, as described below:

- a. OIG statement: “*The plans for the NAPL and vapor intrusion investigations did not fully address the objectives established with CTS in the 2012 AOC.*”

Region 4 response: The AOC Statement of Work stated, as its objectives for the NAPL investigation, that there shall be a NAPL Sampling and Analysis Plan, followed by a NAPL Work Plan. The NAPL investigation fully complied with these objectives. Similarly, the AOC Statement of Work stated, as its objectives for the vapor intrusion assessment, that there shall be a Vapor Intrusion Assessment Work Plan that will evaluate vapor intrusion at homes that are immediately contiguous to the site and proximate to the currently known contaminated ground water plume. The Statement of Work goes on to say that the Vapor Intrusion Assessment Work Plan will be modified as more information about the contaminated plume is identified. There then followed a Vapor Intrusion Assessment Work Plan that called for the evaluation of vapor intrusion at the relevant homes.

**OIG Response 11a:** The OIG added information that the plans did not fully address the objectives for those specific investigations in the AOC.

- b. OIG statement: *“The work conducted for the NAPL Investigation was not sufficient to fully meet the objective stated in the work plan”.*

Region 4 response: The scope of the NAPL investigation work plan was limited to defining the presence of NAPL and TCE on the nine-acre plant site from the observed water table to the top of competent bedrock. The NAPL work plan was never intended to assess potential TCE impacts to the fractured bedrock as the OIG indicates. Rather, the fractured bedrock issue was always planned to be addressed by the site-wide RI/FS work plan approach.

**OIG Response 11b:** The OIG added information that the work plan did not include the deep bedrock.

- c. OIG statement: *“...the vapor intrusion plans did not initially include indoor air sampling”*

Region 4 response: Region 4 followed established policy and procedures for evaluating vapor intrusion in September 2012. See the Tier 2 Secondary Screening recommendations in Section V of “OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance),” November 2002, EPA530-D-02-004, in effect at the time, which states the following:

Users are encouraged to consider the evidence for vapor intrusion in sequential steps, starting with the source of vapors (contaminated groundwater or unsaturated soils), proceeding to soil gas in the unsaturated zone above the source, and upward to the exposure point (e.g., subslab or crawlspace vapor). Then, if indicated by the results of previous steps, collect and evaluate indoor air data. In our judgment, this sequential evaluation of independent lines of evidence provides a logical and cost-effective approach for identifying whether or not subsurface vapor intrusion is likely to contribute significantly to unacceptable indoor air quality. Collection of indoor air quality data without evidence to support the potential for vapor intrusion from subsurface sources can lead to confounding results.

CTS, citing the 2002 vapor intrusion guidance, maintained a consistent position that the sampling take place in a step-wise sequence beginning with the crawl space and then proceeding to indoor air if the crawl space sample indicated a potential for indoor air contamination.

**OIG Response 11c:** The statement in the report that the “plans did not initially include indoor air sampling” is true. OIG disagrees with the agency and made no change in response to its comment.

d. OIG statement: *“Perimeter monitoring for the TCRA system is not extensive, with no information on TCE levels in air and water leaving the eastern end of the fenced area being gathered on a regular basis.”*

Region 4 response: The issue of perimeter air monitoring is covered further below. The OIG statement *“...no information on TCE levels in air and water leaving the eastern end of the fenced area”* conflicts with available data and should be deleted from the draft report.

**OIG Response 11d:** See OIG Response 4.

e. OIG statement: *“Residents living near the contaminated springs potentially were exposed to unsafe levels of TCE in the air in their homes longer than they would have been if air sampling had met all established requirements and procedures.”*

Region 4 response: As noted above, Region 4 was following established requirements and procedures for air sampling that were effective at that time. Further, property owners repeatedly denied EPA access for sampling.

**OIG Response 11e:** The OIG disagrees that the region was following established procedures. In response to our discussion on July 26, 2016, regarding guidance, the OIG removed “all” and “requirements” from the statement in the report.

f. OIG statement: *“Uncertainty remains about the levels of TCE in parts of the private property that surrounds the TCRA system.”*

Region 4 response: It is unclear which media OIG is referring to in this statement. Region 4 has extensively investigated the nature/extent of TCE impacts on the private property to the east. Region 4 conducted quarterly air sampling around the perimeter of the TCRA system from June 2014 through April 2015. This sampling program provided clear evidence that air impacts are localized to the vapor recovery system area. TCE concentrations in surface water at seeps in the eastern springs area were ~30,000 ppb before the remediation system was installed. TCE concentrations in surface water exiting the remediation system now are ~30 ppb—a three orders of magnitude reduction.

**OIG Response 11f:** The OIG disagrees, as the air and surface water at the eastern end of the fence surrounding the TCRA system have been sampled only once since the system began operation. The OIG made no change in response to the region’s comment.

12. **Chapter 2/Work Plan and Execution Inadequate to Define NAPL/Page 10** The OIG states that The 2012 AOC called for sampling and analyzing NAPL “in the subsurface zone below the water table,” which it does not. The AOC Statement of Work says that subsurface pathways of migration shall be defined as part of the Remedial Investigation. This section of the OIG’s report repeatedly evaluates the intentionally limited NAPL Work Plan against the criteria for a complete Remedial Investigation.

The sampling conducted under the NAPL Investigation Work Plan defined the NAPL plume and area of high TCE concentrations in the overburden aquifer (top of bedrock) below the plant site, which was sufficient to support Region 4's push to expand the source treatment area three-fold (one acre to three acres), and the volume five-fold (40,000 CYs to > 200,000 CYs).

The OIG states that design and implementation of the Interim Action Record of Decision have been delayed because the initial sampling was not extensive enough to meet an objective stated in the initial work plan. Region 4 does not agree with this statement. While the Focused Feasibility Study to support the Interim Action Record of Decision had to be amended to support the expansion of the treatment area, the amendment was conducted within the usual public comment period for a Proposed Plan so there was no resulting delay.

**OIG Response 12:** The OIG disagrees with the region's statement regarding the language in the AOC. While the draft report did not use the exact language of the AOC, the meaning was the same. The OIG added the exact language of the AOC, "saturated zone."

The OIG disagrees with the region's statement that there was no delay. On October 29, 2015, the region extended the public comment period by 30 days to provide time for CTS to prepare an amendment to its proposed plan to take into consideration the results of the expanded investigation. The OIG made no changes in response to this part of the region's comment.

13. **Chapter 2/Problems With Work Plans Potentially Prolonged Exposures to Unsafe Levels of TCE in Air/page 11** Region 4 maintains that the primary reason for the prolonged exposure of nearby residents to potentially unsafe air was that the property owners refused to grant EPA access to collect air samples. Region 4 disagrees that there were any problems with the work plans, as is outlined above. The work plans were consistent with the guidance in place at the time. If EPA had been granted access, the work plan would have allowed Region 4 to determine whether indoor air sampling was warranted and also determine the relative contributions of vapor intrusion and ambient air contamination to the risk to human health at the site.

**OIG Response 13:** The OIG disagrees. While denial of access contributed to the delay, in the OIG's opinion, problems with the workplans also contributed to the delay. The report described those problems. The OIG made no change in response to the region's comment.

14. **Chapter 2/ Vapor Intrusion Not Completely Assessed Because of Limited Work Plan Scope/page 11** The OIG states that "the Region could not rule out vapor intrusion as contributing to the TCE measured in the homes." TCE concentrations in the ambient air and crawl space samples from the homes in question on the [redacted] property were very similar, which supports the conclusion that vapor intrusion is not a complete exposure pathway for these homes. EPA's protocol for evaluating vapor intrusion (in 2012) was to sample the crawl space first, then move to indoor air if the crawl space sample exceeded health-based screening levels. Although the presence of TCE in ambient air would have

caused elevated levels in the crawl space samples, one would expect higher levels of TCE in crawl space air as compared to ambient if vapor intrusion was also contributing contamination. In addition to this work in 2014, the Region conducted soil gas analysis in 2007 and 2008 that indicated the presence of TCE in soil gas was fairly limited on the [redacted] property. The 2014 sampling was designed to confirm this older data and determine if vapor intrusion and/or ambient air to indoor air were completed exposure pathways. Region 4 asserts that the work done according to the plan fully met the objective in the AOC to evaluate vapor intrusion.

About Table 3: Region 4 recommends changing the title of this table as none of the criteria in the table come from the AOC or its Statement of Work.

**OIG Response 14:** The OIG disagrees. The region's conclusion that vapor intrusion is not a complete exposure pathway for these homes cannot be supported by the data collected by AMEC since 2014, as the data did not include measurement of soil gas under the homes. In addition, little information is available on how the subsurface conditions have changed over time, making it not possible to assess whether the soil gas measurements taken in 2007 under and near these homes represented current conditions. The conceptual site model the region developed in 2015 shows the groundwater contamination plume extending below these homes. This placement of the homes over the plume means that a potential for vapor intrusion exists. A complete vapor intrusion evaluation would have included soil gas sampling. The OIG made no changes to the report in response to this part of the agency's Comment 14.

The OIG changed the title of Table 3 to remove reference to the AOC.

15. **Chapter 2// Unsafe Exposures May Have Occurred for Longer as Sampling Inside Homes Was Delayed/page 12** The OIG asserts that Region 4 did not follow established policy and procedures for evaluating vapor intrusion in September of 2012 citing an Interstate Technology and Regulatory Council document and two unnamed EPA documents. All of the cited EPA documents were under development at that time, and were not yet "established policy and procedure" for EPA.

**OIG Response 15:** See OIG Response 7.

16. **Chapter 2/Sampling Too Limited to Characterize TCE Levels Around TCRA Perimeter Fence/page 14** The Superfund Program focuses on the primary point of potential exposure, wherever it occurs, rather than on contaminant levels at a facility "fence line," a concept more commonly applied to regulatory and permitting programs. Therefore, in this case, where the exposure concern is for residents, EPA conducted air monitoring at the homes nearest the vapor removal system.

Region 4 has previously provided the OIG results from air monitoring for sample events in June 2014, October 2014, January 2015, and April 2015. The 2014 events were conducted prior to startup of the vapor capture system. The 2015 events were conducted after the system was operational. This quarterly outer perimeter air monitoring program generated 52 individual data points of ambient, crawl space and indoor air. Of the 51 data points

associated with residential properties, none exceeded EPA's most stringent TCE indoor air standard of 2 µg/m<sup>3</sup>. The single data point that exceeded 2 µg/m<sup>3</sup> was AAS-15 (2.5J µg/m<sup>3</sup> in April 2015). This sample was collected near the vapor recovery system (not associated with a residential property), which was not a location chosen for its technical value, but was instead a location requested by the property owner. Region 4 also added quarterly ambient air sampling at the western springs area, which is nearest the residential properties ([redacted]) on that side of the CTS site.

The OIG identified a May 1993 EPA technical guidance for ambient air monitoring at Superfund Sites (footnote 6) as justification supporting this finding. This guidance states that a minimum number of 4 samples (one upwind/three downwind) should be collected. The sampling program Region 4 implemented included quarterly sampling for one year, at seven homes that form an outer perimeter around the TCRA area. As noted above, the outer perimeter air monitoring program generated 52 individual data points of ambient, crawl space and indoor air. The TCRA perimeter air monitoring program implemented by Region 4 far exceeded the minimum standard noted by the OIG.

**OIG Response 16:** See OIG Response 4.

In addition, the outer perimeter air monitoring program included no locations within 250 feet of the perimeter fence. Therefore, although the OIG recognizes that the outer perimeter air monitoring was important for ensuring residents living further from the TCRA that the air in their homes was safe, it did not provide data on the level of TCE in the air at the perimeter fence. The OIG made no changes in response to this comment. (Note that the agency's response refers to footnote 6; in the final report, this is footnote 7.)

17. **Chapter 2/No Regular Monitoring of Stream Leaving TCRA Perimeter/page 14** - This section states, "...TCE and vinyl chloride were measured at levels that exceed water quality criterion". In 2010, well before the installation of the TCRA springs treatment system, Region 4 evaluated risk to human health for a "recreational/trespasser" exposure scenario in the stream in close proximity to the contaminated springs. Despite levels of TCE approaching three orders of magnitude higher than current levels, this risk assessment concluded the risk to human health did not exceed a 1E-04 risk. In addition to reducing concentrations in air levels, the installation of the springs vapor removal system has greatly reduced levels of contamination in the surface stream. In 2015, after the installation of the springs vapor removal system, Region 4 conducted a second risk assessment, also concluded that risk to human health for a "recreational/trespasser" exposure scenario for TCE, vinyl chloride, and 1,2-DCE (vinyl chloride and 1,2-DCE are breakdown products of TCE) did not exceed a 1E-04 risk. The criteria referenced by the OIG are the National Recommended Water Quality Criteria (NRWQC) for drinking water, which assumes human consumption of stream water plus organisms. Region 4 does not consider that to be a reasonable nor completed exposure pathway. Because this is a surface stream, Region 4 believes it is more appropriate to compare TCE concentrations to Region 4 surface water screening levels, which are 200 µg/L (chronic) and 2,000 µg/L (acute). The 34.5 µg/L level of TCE detected in the stream water is well below these conservative ecological screening levels.

**OIG Response 17:** The OIG added footnote 8 on the criterion used by the region’s risk assessor in 2015.

18. **Chapter 2/No Regular Monitoring at Eastern End of TCRA Perimeter/page 15** – This section states, “*The level of TCE in the air discharged out the treatment system in January 2016 was 25 times the removal management level set for indoor air for acceptable performance of the system.*” The performance monitoring program for the springs vapor removal system is based on two factors – (1) “capture efficiency” of the liner system over the springs and (2) removal efficiency of the air treatment system. The air treatment system is directly evaluated by sampling the inlet and discharge of the carbon treatment units. The “capture efficiency” is indirectly evaluated by collecting ambient air samples near the residences that surround the spring. One of these sample locations is basically on the fenceline of the system near the closest residence. The effluent sample from the treatment system on January 13, 2016, for TCE was 51  $\mu\text{g}/\text{m}^3$ . The indoor air removal management level for TCE is 2  $\mu\text{g}/\text{m}^3$  for a sensitive population. The OIG’s “25 times” comparison would have to involve a woman of child bearing age breathing air directly from a treatment system discharge stack. EPA does not consider that to be a reasonable nor completed exposure pathway. Rather, EPA notes that ambient air samples collected nearest the point of potential human exposure (concurrent with the effluent sample) for TCE were 0.73  $\mu\text{g}/\text{m}^3$  at AAS-05; and 0.46  $\mu\text{g}/\text{m}^3$  at AAS-06. Region 4 asserts that the current monitoring program for the TCRA adequately assesses the performance of the system, as well as characterizing risk at points of potential exposure.

**OIG Response 18:** The report statement that “[t]he level of TCE ... was 25 times ...” is a correct statement. The report continues with the explanation that “[d]ispersion and breakdown should decrease the level of TCE, so that the level is lower at the perimeter fence than where the treatment system discharges.” In the OIG’s opinion, this follow-up explanation is sufficient to address the region’s concern. The OIG made no change in response to the region’s comment.

19. **Chapter 2/No Threshold Levels for Ambient Air Monitoring/bottom page 16 and top page 17** There is no action level for TCE in outside (ambient) air. Region 4 is using, as threshold levels, EPA’s recommended removal management levels for TCE in indoor residential air, which are 2  $\mu\text{g}/\text{m}^3$  for homes with sensitive populations (women of child bearing age) present and 6  $\mu\text{g}/\text{m}^3$  for less sensitive populations. Region 4 applies a tailored, conservative approach by using the indoor air values as screening values for outdoor air (outdoor air concentration = indoor air concentration), depending on the residents in the respective homes. For location AAS-05, the screening level is 6  $\mu\text{g}/\text{m}^3$  because the nearest residence is not occupied by a woman of child bearing age. For station AAS-06, the screening level is 2  $\mu\text{g}/\text{m}^3$  because the nearest residence is occupied by a woman of child bearing age.

**OIG Response 19:** See OIG Response 24.



20. **Chapter 2/Risk of TCE Exposure From Contaminated Springs Not Assessed/page 17**

The OIG faults Region4 for not addressing, in the 2012 AOC, the vapors rising from the springs as an exposure pathway. The EPA has been addressing the exposure pathway from the springs as a removal action under a different AOC -- one dating from 2004. The EPA determined that the situation at the eastern springs was urgent enough to warrant a removal action. The risks from the vapors rising from the springs have been assessed and are being constantly monitored. All of this work is being done under work plans submitted, approved, and made enforceable by the 2004 removal AOC.

**OIG Response 20:** As acknowledged in Chapter 3, the region “[u]sed an enforcement instrument already in place—the 2004 AOC—to quickly initiate a removal action in 2014 to address unsafe conditions at the eastern springs.” We found no evidence that between abandoning the pilot ozonation project in 2010 and these emergency actions in 2014, the region was actively addressing the exposure pathway from the springs under the 2004 AOC. The OIG made no change in response to the region’s comment.

## B. REGION 4'S RESPONSE TO RECOMMENDATIONS

**OIG Recommendation 1:** Develop and implement management controls to make work plans for the CTS site consistent with objectives in AOCs and other enforceable documents, and to publicly document decisions to approve work plans that deviate from or only partly address objectives.

**EPA Region 4 Response:** Do Not Concur. Region 4 does not agree that there was anything about the work plans approved at this site that would require special management control. Further, Region 4 asserts that the work plans approved at this site are consistent with the AOCs in effect for the site. It is common practice for work described in an AOC to be achieved in manageable segments, prioritized by risk and need, which is what Region 4 has done at this site. Region 4 will continue to keep the public informed by making finalized settlement agreements and approved work plans available to the public and to describe those milestones in regular community updates.

**OIG Response 21:** Recommendation 1 is unresolved.

**OIG Recommendation 2:** Meaningfully engage the community in the development of investigation plans, understanding the investigation results, and deciding cleanup approaches.

**EPA Region 4 Response:** Concur. Region 4 believes its community involvement strategy for the Site is comprehensive in scope, and Region 4 will continue to meaningfully engage the community in all future investigation and cleanup phases. Planned completion date: ongoing.

**OIG Response 22:** Recommendation 2 is unresolved.

**OIG Recommendation 3:** Direct that sampling at and near the contaminated eastern springs is comprehensive enough to assess all potential exposure pathways, including vapor intrusion, and to monitor the full effects of the TCRA system on ambient air around the perimeter fence and the stream flowing under the fence.

**EPA Region 4 Response:** Do Not Concur. Region 4 strongly asserts that sampling at and near the contaminated eastern springs comprehensively assesses all potential exposure pathways, including vapor intrusion. Based on the 2007, 2008 and 2014 sampling on the [redacted] property and SSV, Region 4 has ruled out vapor intrusion as a completed pathway at the site. The current ambient air sampling protocol (quarterly at 2 locations), along with the process QC samples collected from the mitigation system, is comprehensive enough to ensure the protection of nearby residents. As noted below in response to Recommendation #4, Region 4 asserts that the air monitoring locations near dwellings are more appropriate than the fence line, because they are closer to the point of potential exposure. Although Region 4 does not believe the stream water poses a risk to human health and the

environment, Region 4 will consider more frequent water quality monitoring of the stream flowing under the fence.

**OIG Response 23:** Recommendation 3 is unresolved.

**OIG Recommendation 4:** Establish threshold levels for the ambient air monitoring around the perimeter fence of the TCRA system that would prompt action if exceeded.

**EPA Region 4 Response:** Do Not Concur. Region 4 is using, as threshold levels, EPA's recommended removal management levels for TCE in indoor residential air, which are 2  $\mu\text{g}/\text{m}^3$  for homes with sensitive populations (women of child bearing age) present and 6  $\mu\text{g}/\text{m}^3$  for less sensitive populations. Region 4 applies a tailored, conservative approach by using the indoor air values as screening values for outdoor air (outdoor air concentration = indoor air concentration), depending on the residents in the respective homes. For location AAS-05, the screening level is 6  $\mu\text{g}/\text{m}^3$  because the nearest residence is not occupied by a woman of child bearing age. For station AAS-06, the screening level is 2  $\mu\text{g}/\text{m}^3$  because the nearest residence is occupied by a woman of child bearing age. Any exceedance of these threshold levels will trigger the need for corrective action on the TCRA springs vapor removal system.

**OIG Response 24:** Although the region did not concur with Recommendation 4 in its written comments, it provided corrective actions that meet the intent of the recommendation. In the July 26, 2016, meeting, the region agreed to July 21, 2016, as the completion date. The OIG considers Recommendation 4 closed.

**OIG Recommendation 5:** **A)** Develop, or require CTS to develop, a model focused on vapor exposure pathways before accepting any additional work products related to the vapor exposure pathways. This vapor-focused model should be a subset of, and consistent with, the site-wide model the region created in February 2015. **B)** Review any previously approved work plans in the process of being implemented, particularly work plans related to vapor exposure pathways, in the context of the updated model, and revise those plans as needed. **C)** Develop and implement a plan for (1) updating the models that, together, comprise the conceptual site model, as new information on site conditions is obtained; (2) incorporating those updated models into new work and action plans; and (3) using the conceptual site model to better engage the community in the site investigation and cleanup work.

**EPA Region 4 Response:** Concur. As noted above in response to Recommendation #3, "traditional" vapor intrusion assessment consisting of sub slab and soil gas was conducted in 2007 and 2008. Based on existing characterization data, Region 4 believes the vapor exposure pathway is principally driven by TCE volatilization off the eastern springs area. This pathway has been mitigated by the construction and operation of the springs vapor removal system. A vapor focused conceptual site model can be accurately developed from existing characterization data.

Planned completion date: December 31, 2016.

**OIG Response 25:** The region concurred with Recommendation 5 and provided an acceptable corrective action and planned completion date for part a. As corrective actions and planned completion dates were not provided for parts b and c, those parts remain unresolved.

**OIG Recommendation 6:** Adhere to EPA guidance and policy and use appropriate enforcement tools to ensure access to private properties needed to conduct investigation and cleanup activities.

**EPA Region 4 Response:** Region 4 concurs that it will adhere to EPA guidance and policy and use enforcement tools as appropriate to seek access to private properties needed to conduct investigations and cleanup activities. Planned completion date: Immediately.

**OIG Response 26:** In the July 26, 2016, meeting, the region agreed to July 21, 2016, as the completion date. The OIG considers Recommendation 6 closed.

**OIG Recommendation 7:** Require CTS to proceed with approved work where it has access.

**EPA Region 4 Response:** Concur. Planned completion date: Immediately.

**OIG Response 27:** In the July 26, 2016 meeting, the region agreed to July 21, 2016, as the completion date. The OIG considers Recommendation 7 closed.

**OIG Recommendation #8:** “We also recommend that the Assistant Administrator for Enforcement and Compliance Assurance: Establish the criteria regions should consider when determining that access negotiations have been ‘lengthy’ in the context of the *Entry and Continued Access under CERCLA* policy; and other factors the regions should consider, in addition to length of negotiations, in choosing to delay implementing the enforcement alternatives of this policy.”

**EPA Region 4 Response:** Region 4 defers to OECA. Please see attachment for their response.

**OIG Response 28:** Although OECA did not concur with Recommendation 8, it provided acceptable corrective actions and a planned completion date of October 1, 2016. Recommendation 8 is resolved. See OIG Response 33.

**OIG Recommendation 9:** Include an updated table of *Projected Future Activities and Schedules* with each community update.

**EPA Region 4 Response:** Concur. Future community updates will provide future activities and anticipated schedules. Planned completion date: Beginning with the next Community Update, ongoing after that.

**OIG Response 29:** In the July 26, 2016, meeting, the region agreed to December 31, 2016, as the completion date. The OIG considers Recommendation 9 resolved.

**OIG Recommendation 10:** Close out the site-specific on-scene coordinator web page by adding information on the site's Superfund status, updating the contact information, and providing a link to the Superfund Site Profile web page where new information will be posted.

**EPA Region 4 Response:** Concur. Planned completion date: December 31, 2016

**OIG Response 30:** The OIG considers Recommendation 10 resolved.

**OIG Recommendation 11:** Add documents to the EPA's Superfund Site Profile web page for the site, including:

- a) Status of removal and remedial activities.
- b) The 2016 community involvement plan and community updates.
- c) Frequently requested documents, including recent and historical work plans, sampling schedules, result reports and action plans.
- d) Pollution reports for removal actions conducted since 2012 and a link to older reports on the on-scene coordinator web page.
- e) Administrative records for removal and remedial actions.
- f) Other site documents as appropriate to support removal and remedial site actions and activities.

**EPA Region 4 Response:** Concur. Many of these documents and reports were posted to the "old" Superfund Site Profile web page. These document links were lost when EPA migrated to the "new" One EPA framework. Planned completion date: Improvements to the CTS web page are on-going, and the new information will be added by December 31, 2016.

**OIG Response 31:** The OIG considers Recommendation 11 resolved.

**OIG Recommendation 12:** Develop and implement site-wide hydrologic and water-quality monitoring that will integrate the planned monitoring of the fractured bedrock; the ongoing monitoring of wells used for drinking water, the removal action system at the eastern springs, and ambient air at the western springs; and the yet-to-be designed and implemented monitoring for the interim remedial action.

**EPA Region 4 Response:** Concur. Monitoring programs for the 15 drinking water wells with filtration systems, the springs vapor removal system, and ambient air at

the western springs have been developed and are currently being implemented. Because the TCE concentrations are expected to decrease with time after source control is conducted in the overburden aquifer, the February 2016 Interim Action ROD requires development of a monitoring plan for the deeper bedrock,. Development of a monitoring plan for the bedrock aquifer and the overall Interim Remedial Action will begin with the Remedial Design Work Plan. Planned completion date: The Remedial Design Work Plan is due 30 days from Region 4's Authorization to Proceed under the anticipated consent decree.

**OIG Response 32:** In the July 26, 2016, meeting, the region agreed to June 30, 2017, as the completion date. The OIG considers Recommendation 12 resolved.

**ATTACHMENT**  
**OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE (OECA)**  
**RESPONSE TO RECOMENDATIONS**

- 1. OIG Recommendation 8:** We also recommend that the Assistant Administrator for Enforcement and Compliance Assurance: Establish the criteria regions should consider when determining that access negotiations have been ‘lengthy’ in the context of the *Entry and Continued Access under CERCLA* policy; and other factors the regions should consider, in addition to length of negotiations, in choosing to delay implementing the enforcement alternatives of this policy.

**OECA Response:** Do Not Concur.

**Summary:** OECA appreciates the opportunity to respond to OIG’s Draft Report, “Progress Made, But Improvements Needed at the CTS of Asheville Superfund Site in North Carolina to Advance Cleanup Pace and Reduce Exposure,” Project No. OPE-FY14-0044.” OECA agrees with the OIG that response actions need to be implemented in a timely manner to address threats to human health and the environment. OECA disagrees, however, with the OIG’s recommendation that OECA establish specific criteria for regions to consider when determining appropriate options for access. OECA believes that the current publicly accessible policy, *Entry and Continued Access under CERCLA* (“Access Guidance”), provides substantial information to help regions determine how to effectively secure access at a particular site, and OECA is concerned that providing more specific criteria in a public document, by amending or supplementing the existing guidance, would benefit property owners who are refusing to grant access, and might limit needed Agency flexibility to address case-specific circumstances. Notwithstanding, in order to address OIG’s concerns, OECA is willing to send an internal message to the regional offices urging a careful review of the considerations set forth in the Access Guidance and setting out some examples of factors to consider in determining the appropriate amount of time to negotiate an access agreement. In developing this message, we will work with our regional offices to list a set of factors. Such factors will include the urgency of the risk to be measured or abated, the length of time during which access will be necessary, how disruptive the work will be to the property owner’s usual use of the property, and the overall scope and duration of the response action and also may include additional factors suggested by the regions.

**Discussion:** CERCLA gives EPA broad authority to clean up sites where hazardous substances have been released or threatened to be released into the environment. EPA as a matter of course attempts to act as expeditiously as possible in responding to threats to human health or the environment, and, when faced with an emergency situation, acts to address that threat immediately. EPA’s ability to access private property when necessary is essential to allowing EPA to address these threats.

EPA’s Access Guidance sets forth EPA’s statutory authority for accessing private property and clearly states EPA’s preference for obtaining access through consent. In recognition that consent is not always possible, the guidance discusses other mechanisms to gain access (e.g., warrants, court orders, and administrative orders). Regions are encouraged to consider case-

specific circumstances – such as the nature of the onsite work; whether the need for access is time-critical; and whether access involves long-term or intrusive activities – when determining the appropriate access mechanism. As noted by the OIG, the guidance states the importance of gaining access in a timely manner when seeking a court order:

[The Regions] should attempt to anticipate the sites at which access may prove problematic and should allow sufficient lead time for the referral process and operation of the courts. The Regions should also not enter *lengthy* negotiations with landowners over access.

(Page 9; emphasis added.)

Every situation that EPA faces during a hazardous waste response under CERCLA is different, and there is no exact formula or time frame that EPA can apply to make its determination as to when or what type of enforcement alternative it should employ to gain access. The threat to be abated is a primary factor that EPA takes into consideration. The Agency also considers the disruptive nature to the property owner of such access and the potential interference with day-to-day life of the property owner from whom access is sought. This consideration of interests of property owners, combined with a case specific assessment of the situation, is why EPA generally chooses to negotiate and work with property owners to obtain access consensually.

Having an array of options for obtaining access from which to choose, along with the discretion as to when to use a particular enforcement mechanism, is important to EPA's ability to carry out its mission under varying situations. Confining ourselves to a limited set of specific factors that EPA will consider when determining whether to delay the enforcement options would not be good governmental policy. EPA's decision should appropriately be a case-by-case determination based on the facts on the ground and what's necessary to address serious public health and environmental emergencies. Establishing specific factors to consider in choosing to delay taking an enforceable approach has the potential to weaken the enforcement alternatives that Congress has provided in CERCLA.

In summary, OECA believes that the publicly available Access Guidance adequately establishes the expectation for timely obtaining access in the context of the specific situation. OECA therefore respectfully disagrees with the recommendation to establish a specific set of criteria regions should consider when determining that access negotiations have been "lengthy," and other factors the regions should consider, in addition to length of negotiations, in choosing to delay implementing the enforcement alternatives of the Access Guidance. Every case that EPA approaches is different, with different potential threats and fact patterns that inform the decision as to when and how it is most appropriate to use our stronger access authorities to require a private property owner to provide access.

**Proposed Corrective Action:**

By October 1, 2016, the Director of the Office of Site Remediation Enforcement will prepare a message for internal email distribution to the regional offices, reminding them of the need



for prompt access and the available enforcement tools described in the *Entry and Continued Access under CERCLA* policy (“Access Guidance”). OSRE’s message will: (1) set out some examples, developed in collaboration with our regional offices, of factors to consider in determining the appropriate amount of time to negotiate an access agreement; (2) urge regions to review the considerations set forth in the Access Guidance; (3) attach the OIG draft report and OECA’s response; and (4) specifically highlight OIG’s stated concerns about access negotiations. In addition, the message will encourage regions to contact OECA when consent to access is repeatedly denied at a particular Superfund site.

**OIG Response 33:** Although OECA did not concur with Recommendation 8, it provided acceptable corrective actions and a planned completion date of October 1, 2016. Recommendation 8 is considered resolved. See OIG Response 28.

**2. OECA General Comment:**

OECA requests that OIG consider adding disclaimer language that it has included in past reports regarding how the report's findings are not binding upon the United States in any enforcement proceeding. This would be consistent with our understanding of the purpose of your audits, i.e., to promote continuous improvement in our program, and not to affect pending or new enforcement actions. Inclusion of a disclaimer would reduce the likelihood that questions raised in your reports would be raised by defendants in an enforcement action.

**Proposed Corrective Action**

OECA requests that OIG include the following disclaimer language:

"This audit report contains findings that describe problems the Office of Inspector General (OIG) has identified and corrective actions the OIG recommends. This audit report represents the opinion of the OIG. Final determination on matters in the audit report will be made by EPA managers in accordance with established EPA audit resolution procedures. Accordingly, the findings contained in this audit report do not necessarily represent the final EPA position, and are not binding upon EPA in any enforcement proceeding brought by EPA or the Department of Justice."

**OIG Response 34:** The OIG agreed and added the following sentence to the memorandum in the final report: “The findings in this report are not binding in any enforcement proceeding brought by the EPA or the Department of Justice under the Comprehensive Environmental Response, Compensation, and Liability Act.”

## ***Distribution***

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Regional Administrator, Region 4  
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