INTERIM ACTION

RECORD OF DECISION

CTS of Asheville, Inc. Superfund Site
Asheville, Buncombe County, North Carolina

United States Environmental Protection Agency Region 4
Superfund Division
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

February 2016

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1.1 SITE NAME AND LOCATION

CTS of Asheville, Inc. Superfund Site
235 Mills Gap Road
Asheville, Buncombe County, North Carolina 28803

Superfund Site Identification Number: NCD003149556

1.2 STATEMENT OF BASIS AND PURPOSE

This Interim Action Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for the CTS of Asheville, Inc. Superfund Site (site), in Asheville, North Carolina, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601-9675 and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting a remedy to address contamination at the site.

The North Carolina Department of Environmental Quality (NCDEQ) was consulted on the proposed remedy in accordance with CERCLA § 121(f), 42 U.S.C. § 9621(f), and concurs with the selected remedy (see Appendix A).

1.3 ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Interim Action ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment. The response action selected in this Interim Action ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substance into the environment.

1.4 DESCRIPTION OF THE SELECTED INTERIM REMEDY

This Interim Remedial Action is a source control action for Non-Aqueous Phase Liquid (NAPL) and trichloroethene (TCE) on the former CTS plant site. The Interim Remedial Action will be followed up with a final site-wide cleanup decision that is not expected for several years. The area to be addressed with this interim action is 3.1 acres (see Figure 1). This source control action addresses approximately 208,250 cubic yards (CYs) of material in the saturated zone between the observed water table and top of competent bedrock. The major components of the selected interim remedy include the following:

- Electrical Resistance Heating (ERH) to treat the mixed NAPL and TCE plume in an approximate 1.2 acre area. ERH will address about 47,250 CYs of saturated material contaminated by NAPL/TCE.
- In-Situ Chemical Oxidation (ISCO) will be utilized to treat the TCE (only) contamination in the expanded Northern Area (approximately 1.9 acres). The volume of the 1.9 acre expanded treatment area is approximately 161,000 CYs.
- Monitoring will be conducted during remedy implementation to ensure adequate protection of on-site workers and the surrounding community. Performance data will be collected to demonstrate the effectiveness of the interim remedy in meeting the Remedial Action Objective (RAO), which is a 95%

reduction in the TCE concentration. Groundwater monitoring of TCE in the deeper bedrock aquifer will also be conducted to evaluate the anticipated decreasing concentration trends over time.

1.5 DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA § 121, 42 U.S.C. § 9621, in that it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants, and contaminants which at least attains the legally applicable or relevant and appropriate requirements under federal and more stringent state laws or regulations (unless a statutory waiver is justified); 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In addition, the interim remedy satisfies CERCLA's preference for remedies that employ treatment to permanently and significantly reduce the volume, toxicity or mobility of hazardous substances as a principal element.

Because this Interim Remedial Action will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the Interim Remedial Action to ensure that the remedy is, or will be, protective of human health and the environment.

1.6 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary (Section 2.0) of this ROD. Additional information can be found in the Administrative Record for this site.

- Chemicals of Concern (Section 2.5.3)
- Summary of Site Risks (Section 2.7);
- Remedial Action Objective (Section 2.8);
- How the selected interim remedy addresses NAPL/TCE source material that constitutes principal threat waste (Sections 2.11, 2.12 and 2.13.5)
- Estimated costs of remedial alternatives considered (Sections 2.9.1 and 2.10.7)
- Key factors that led to selecting the interim remedy (Sections 2.12 and 2.14)

1.7 SUPPORT AGENCY ACCEPTANCE

The State of North Carolina Department of Environmental Quality (NCDEQ), as the Support Agency for the CTS of Asheville, Inc. site, concurs with the Interim Action ROD. The NCDEQ concurrence letter has been added to the Administrative Record (Appendix A).

1.8 AUTHORIZING SIGNATURE

Franklin E. Hill (signature) 2/11/2016

Franklin E. Hill, Director
Superfund Division
U.S. EPA Region 4

Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The CTS of Asheville, Inc. Superfund Site is located at 235 Mills Gap Road in Asheville, North Carolina 28803. The approximate center of the site is located at north latitude 35°29'36" and west longitude 82°30'25". The site formerly contained an approximate 95,000-square foot, single-story brick and metal-framed structure on the southern portion of the site. The building was demolished in December 2011, and the concrete building slab remains intact. The northeastern portion of the site contains an asphalt-paved parking area and asphalt paved driveways are located parallel to the north (front) of the former building and southeast (rear) of the former building. A six-foot high chain-link fence surrounds the site and a locked gate at the north end of the site controls access to the site from Mills Gap Road. The site has been vacant and unoccupied since the mid-1990s. The site and adjacent property boundaries are illustrated on Figure 1.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

International Resistance Company, (now Northrop Grumman Systems Corporation as the result of a series of mergers) owned and operated the site from 1952 to 1959, when CTS of Asheville, Inc. purchased the real property, building, and equipment. Arden Electroplating, Inc. leased a portion of the building from December 1985 until December 1986, when it was sold to Mills Gap Road Associates (MGRA). CTS manufactured electronic components used in auto parts and hearing aids from 1959 to April 1986 when plant operations ceased. Small electronic components were electroplated with tin, nickel, zinc and silver as one step in the process. Solvents, including TCE were used to clean, or degrease, the parts before electroplating. Disposal and/or recycling activities at the facility prior to 1959 are unknown. From 1959 to 1980, metal-bearing rinse waters and alkaline cleaners that could not be reclaimed from the electroplating process were reportedly disposed of through the municipal sewer system, while concentrated metals and solvent wastes were placed in drums for off-site disposal/recycling. After 1980, wastes were accumulated in drums on-site prior to off-site disposal/recycling.

Numerous environmental investigations have been conducted at the site since the late 1980s (See Section 2.5.4 below). The site was proposed to the National Priorities List (NPL) in March 2011, and became final on the NPL in March 2012.

Three removal actions have been conducted at the site under a 2004 Administrative Order on Consent between EPA, CTS, and MGRA. From July 2006 to July 2010, a Soil Vapor Extraction (SVE) system operated at the site to remove volatile organic compounds (VOCs) from the subsurface, above the groundwater table. An estimated 6,473 pounds of VOCs were removed from the unsaturated zone over that four year period.

From September 2012 to August 2014, CTS installed 101 water supply filtration systems in residences located within a one mile radius of the site who relied on groundwater as their drinking water supply. The filtration systems were installed as a precautionary measure. In 2014 and 2015, municipal water supply lines were installed in the vicinity of the site by Buncombe County. Eighty-seven residences with filtration systems elected to connect to the municipal water line. CTS will continue to maintain the remaining water filtration systems until they are no longer warranted.

In September 2014, a springs vapor removal system was installed by CTS on property immediately to the east of the site, to reduce TCE concentrations in outdoor/indoor air. The remediation system includes a combination of air sparging and vapor extraction. Air sparging pumps push air into the surface water and subsurface at seven locations. Vapors are extracted using a vacuum connected to extraction points at 12 locations and then treated by carbon in canisters. The area was covered with a low density polyethylene liner to increase the system's efficiency. Construction began on September 10, 2014 and the system has been in continuous operation since October 21, 2014. Monitoring indicates the system has been very effective at reducing TCE concentrations in the air and spring water. As of mid-April 2015, the vapor system removed approximately 42 pounds of VOCs from the environment.

CTS also committed to conduct a site-wide Remedial Investigation/Feasibility Study (RI/FS) under the terms of an Administrative Settlement Agreement and Order on Consent (AOC), which took effect on January 26, 2012. The Focused Feasibility Study (FFS) that lays the foundation for this Interim Action ROD was developed by CTS according to that agreement.

2.3 COMMUNITY PARTICIPATION

As part of the on-going community involvement program, EPA continues to pro-actively engage and respond to community members, and federal/state/local elected officials. EPA's Community Involvement Plan (CIP), revised in February 2016, is a site-specific strategy that enables meaningful community involvement throughout the Superfund cleanup process. The CIP specifies planned community involvement activities to address community needs, concerns, expectations, and will enable community members affected by the site to understand ways in which they can participate in decision-making throughout the cleanup process. Public interest in the site remains high.

There are two active environmental community groups associated with the site, the Mills Gap Road Contaminated Groundwater Community Advisory Group and the POWER Action Group. The POWER Action Group (Protecting Our Water and Environmental Resources) was awarded EPA's Technical Assistance Grant (TAG) in 2013. The TAG helps communities participate in Superfund cleanup decision-making. It provides funding to community groups to contract their own technical advisor to interpret and explain technical reports, site conditions, and EPA's proposed cleanup plans and decisions throughout the Superfund process. The EPA Remedial Project Manager (RPM) and Community Involvement Coordinator (CIC) work closely with the technical advisor to coordinate technical reviews of work plans and reports.

The RPM and CIC communicate regularly with the property owners immediately east of the site, where the vapor recovery system was installed in the Fall of 2014. This generally involves communication of system performance/maintenance, distribution of air monitoring results, coordinating future air sampling events, and resolving other issues as they arise. EPA also coordinates closely with the property owner of the undeveloped property to west of this site. Upon request, EPA conducts meetings with several Homeowners Associations in the area. EPA also provides site specific information to the media via press releases and desk statements. The Asheville Citizen Times (local newspaper) and WLOS (local TV station) have shown the most interest and coverage of site activities recently.

The CIC developed an email distribution list to keep the community updated on current site status, approved work plans and other documents. This list is frequently updated, and to date there are approximately 400 contacts who have expressed interest in receiving information about the site. This method has been well received and proven to be a very effective communication tool. Prior to the public release of the Interim Remedial Action Proposed Plan, the RPM and CIC also conducted additional community outreach efforts in 2015 by meeting separately with groups that were interested in the details of EPA's Proposed Plan and what the next steps would be in the process.

The draft NAPL Area Focused Feasibility Study (FFS) Report, prepared by Amec Foster Wheeler (AMEC) on behalf of CTS Corporation, was submitted to the EPA on July 31, 2015. The EPA sent comments to CTS on the draft report on August 26, 2015. The EPA announced on September 1, 2015, that a public meeting would be held on October 13, 2015 to present and discuss the Interim Remedial Action Proposed Plan. A final NAPL Area FFS Report was submitted to the EPA on September 10, 2015. EPA agreed with CTS's recommendation of using Electrical Resistance Heating (ERH) as the cleanup technology. However, EPA requested that CTS consider expanding the proposed one-acre ERH treatment area with the interim source control action. Alternatively, EPA suggested a hybrid approach that includes thermally enhanced biodegradation outside of the proposed one acre ERH treatment area. On September 30, 2015, EPA released the Interim Remedial Action Proposed Plan to the community for a 30-day comment period. The October 2015 Proposed Plan is attached as Appendix D. The Proposed Plan was also made available for review at the site information repository at the Pack Memorial Library, 67 Haywood Street in Asheville. The supporting Administrative Record was posted online at: http://semspub.epa.gov/src/collection/04/AR63944.

The initial 30-day comment period for the Interim Remedial Action Proposed Plan lasted from October 1, 2015, through October 30, 2015. At the October 13, 2015 public meeting, EPA gave a formal presentation of the site history, previous removal actions, preferred remedy, and other cleanup options for the site. The majority of the comments from the public encouraged the EPA to expand the one-acre treatment area to include additional acreage to the north. On October 29, 2015, EPA announced that the comment period would be extended 30 days through November 29, 2015. The extension of the comment period was to allow for CTS to evaluate treatment of the Northern Area. On November 25, 2015, AMEC submitted the NAPL Area FFS Report Addendum to EPA.

The Responsiveness Summary in Section 3.0 below provides further discussion regarding the public comments received during the 60-day comment period. Appendix B includes the recorded transcript from the October 13, 2015 public meeting. Appendix C provides redacted copies of all public comments sent to the RPM during the 60-day comment period.

2.4 SCOPE AND ROLE OF RESPONSE ACTION

As noted above in Section 1.4, this Interim Remedial Action is a source control action for NAPL and TCE on the former CTS plant site. The area to be addressed with this interim action is 3.1 acres. This area is illustrated as the "NAPL Area Remediation" (in blue) and "Northern Remediation Area" (in green) on Figure 1. The volume to be addressed with this interim action is approximately 208,250 cubic yards (CYs) of material in the saturated zone between the observed water table and top of competent bedrock. A prior SVE removal action addressed VOCs in the vadose (unsaturated) zone of this general area.

This Interim Action ROD describes the short-term remediation plan for the site that will be followed up later with a final "site-wide" ROD. EPA expects that the interim source control action will mitigate the TCE transport to the eastern/western springs; and greatly improve the quality of the deeper bedrock aquifer. The scope of the final "site-wide" ROD depends on the ultimate success of the Interim Remedial Action. It will require several years to implement the interim source control action and to sufficiently monitor the resultant TCE concentration trends in the bedrock groundwater aquifer. The final "site-wide" ROD will address any remaining unacceptable risks posed to human health and the environment posed by residual NAPL/TCE mass in the subsurface not addressed by this Interim Remedial Action.

2.5 SITE CHARACTERISITCS

2.5.1 Conceptual Site Model

A site-wide Remedial Investigation has not been completed yet. However, in February 2015 EPA released a Conceptual Site Model (CSM) based on interpretations of existing physical and chemical data. The data EPA used to develop the CSM is presented in the North Carolina Remedial Investigation, the EPA NPL Listing Investigations, the EPA Potable Well Sampling, and the CTS NAPL Investigation Reports. Field work included monitoring well installation and sampling, private well sampling, borehole geophysics and evaluation (by the US Geologic Survey) in private wells, pumping evaluations in private wells, borehole geophysics in CTS monitoring wells, geologic mapping by the North Carolina Geologic Survey, spring and surface water sampling, membrane interface probe (MIP) screening, Laser Induced Fluorescence (LIF) screening, dye testing, and soil sampling. The February 2015 EPA Hydrogeologic and Contaminant CSM is part of the Administrative Record. It is important to note that a CSM is dynamic, and the development is iterative. A CSM will change as new data is collected, and uncertainties in the model are addressed. The CSM will continue to be updated as site complexities are further understood.

2.5.2 Overview

The area surrounding the site is rural and contains residential and light industrial properties. The site is relatively flat and is situated on a "saddle" between Busbee Mountain to the north and Brown Mountain to the south-southwest. The geology under the site consists of fill material, residual soil (overburden) and bedrock. The depth to the groundwater table generally fluctuates from 15 to 49 feet below ground surface (bgs), depending on rainfall. The depth to bedrock ranges from 28 to 81 feet bgs.

Groundwater velocity is in the 10 to 100 feet per year range. Groundwater in the overburden generally flows two directions: towards the eastern springs remediation area; and toward another springs area to the west of the site. There is an approximate one-acre plume of light NAPL that is weathered fuel oil mixed with high concentrations of TCE. There is a dissolved phase VOC (only) plume extending north of the NAPL area that moves east and west towards the springs discharge zones (See Figure 1).

2.5.3 Chemicals of Concern

Light NAPL and TCE are the primary chemicals of concern (COCs) addressed by this decision document. Other secondary COCs include chlorinated VOC breakdown products.

2.5.4 Summary of Sampling Results and Other Investigations

Law Environmental, Inc. conducted assessment activities at the site in 1987. The assessment activities were performed for CTS for the purpose of obtaining a general environmental status of the facility. Assessment activities performed inside the former building included subsurface soil sampling, surface wipes, sampling of compressor oil, and sampling of solid residue. Assessment activities performed outside of the building included subsurface soil sampling. Laboratory analytical results of samples collected inside the former building indicated the presence of VOCs, including TCE, in the plating and paint curing areas. Laboratory results of soil samples collected outside of the former building also indicated the presence of VOCs.

In 1989 and 1990, an EPA contractor (NUS) conducted Screening Investigations at the site. NUS collected surface and subsurface soil samples, sediment and surface water samples from surface waters east and west of the site, and a water sample from a private water supply well. Concentrations of VOCs were detected in the surface water and sediment samples. Based on the analysis of possible migration pathways and the results of the sampling investigation, NUS recommended that no further action be planned for the site.

In July 1999, NCDENR (now NCDEQ) collected water samples from three springs east of the site. The spring samples contained VOCs related to chlorinated solvents and petroleum. TCE was detected at concentrations ranging from 8.7 to 21,000 µg/L.

Also in July 1999, NCDENR identified nine private water supply wells within a one-quarter mile of the site. Water supply well samples were collected and analyzed for VOCs. One of the nine wells contained TCE at 270 µg/L (pre-filter) and 170 µg/L (post-filter). TCE was not detected in the other eight water supply wells sampled. NCDENR requested that the EPA Emergency Response and Removal Branch review site information to determine if the site qualified for a removal action under the federal Superfund program.

In November 1999, an EPA contractor (Tetra Tech) conducted a site reconnaissance and sampling investigation. Tetra Tech collected surface soil samples, subsurface soil samples, and sediment samples. The soil and sediment samples contained VOCs related to chlorinated solvents and petroleum.

In August 2000, EPA Response Engineering and Analytical Contract (REAC) personnel conducted a geophysical investigation to determine if buried sources of contamination (e.g., drums of waste material) were located at the site. REAC personnel identified several potential target areas through the geophysical surveys and observations of surface debris. In September 2000, trenches were excavated in these areas and soil samples were collected. Samples were also collected from two of the springs east of the site. The soil and spring samples contained VOCs related to chlorinated solvents and petroleum. Buried sources of contamination were not identified during the trenching activities.

In May 2001, an EPA contractor (Lockheed Martin) collected subsurface soil samples from 12 borings located below or near the former building. The soil samples contained VOCs related to chlorinated solvents and petroleum.

In February 2003, an EPA contractor (Weston Solutions) collected five spring/surface water samples and eight private water supply well samples. The spring/surface water samples collected from the springs area east of the site contained VOCs related to chlorinated solvents and petroleum. Concentrations of VOCs, semivolatile compounds (SVOCs), or total petroleum hydrocarbons (TPH) were not detected in the water supply well samples.

In June and July 2004, CTS's contractor (MACTEC now known as Amec Foster Wheeler) conducted an investigation pursuant to the 2004 Administrative Order on Consent for Removal Action between the EPA Region 4, CTS, and MGRA. The primary intent of the investigation was to delineate the extent of contamination in unsaturated soil at the site. Fifty-five soil samples were collected from 22 borings in and adjacent to the former site building. Three piezometers were installed to provide groundwater elevation information. A temporary well was installed east of the site near the previously-identified contaminated springs and water samples were collected from the springs and the temporary well. All of the samples were analyzed for VOCs, SVOCs, TPH, and polychlorinated biphenyls. Selected samples were analyzed for metals, cyanide, and pesticides. A reconnaissance was also conducted to identify water supply wells near the site and an evaluation of surface water discharge from the springs east of the site was conducted. The soil and spring samples contained VOCs, SVOCs, and TPH related to chlorinated solvents and petroleum.

In August 2004, a Soil Vapor Extraction (SVE) pilot study was conducted to evaluate the feasibility of using SVE for removing VOCs from unsaturated soil beneath and adjacent to the former site building, as delineated in the 2004 investigation. The results of the pilot study indicated that SVE would be an appropriate removal methodology. A SVE system was designed and constructed at the site in June and July 2006 and became operational on July 20, 2006.

In February 2006, CTS's contractor (MACTEC) collected water supply well samples from five locations within a one-quarter mile radius of the site. Samples were analyzed for VOCs, SVOCs, and TPH. The analyzed compounds were not detected in the water supply well samples.

From November 2007 through January 2008, NCDENR, with assistance from EPA contractors, collected water supply samples from 75 residences and analyzed the samples for VOCs. Site-related VOCs (cis-1,2-dichloroethene [cis-1,2-DCE] and TCE) were detected in two water supply well samples collected from wells located approximately 4,000 feet northeast of the site.

In November and December 2007, NCDENR, with assistance from EPA contractors, collected 14 surface soil samples and spring/surface water samples. The soil samples were collected from locations within approximately 1,500 feet of the site boundary and analyzed for VOCs, SVOCs, and metals. Site-related VOCs were not detected in the soil samples. Three SVOCs and seven metals were detected at concentrations below EPA's residential Removal Action Levels. The spring/surface water samples were collected from springs located east and west of the site, springs located on Sweeten Creek Road, and from the unnamed tributary that is formed from the springs east of the site. Site-related VOCs and SVOCs were detected in the spring and surface water samples collected nearest the site (i.e., not in the Sweeten Creek Road spring samples).

In December 2007 and January 2008, an EPA contractor (TN & Associates now known as OTIE) collected 15 subsurface soil and groundwater samples from locations at the site and within approximately 1,200 feet of the site boundary. The subsurface soil samples were collected from depths ranging from 2 to 30 feet bgs. The soil and groundwater samples were submitted for analysis of VOCs, SVOCs, metals, and cyanide. Site-related VOCs and SVOCs were not detected in the soil samples. Site-related VOCs and one SVOC were detected in groundwater samples collected at and immediately adjacent to the site to the east. Metals were detected in the soil and groundwater samples at concentrations that were within naturally-occurring metal concentrations. Cyanide was detected in the soil and groundwater samples; however, cyanide has not been historically detected at elevated concentrations at the site and is not considered a site-related contaminant of concern

In December 2007, EPA and their contractors collected air samples within approximately 1,200 feet of the site boundary. The following air samples were collected: 18 soil gas, 10 sub-slab, 12 crawlspace/basement, and 7 ambient. The air samples were submitted for analysis of VOCs. Site-related VOC concentrations in samples collected from residences were below EPA's then-applicable removal action concentrations.

Also in December 2007, an EPA contractor (Lockheed Martin) conducted an air investigation using a Trace Atmospheric Gas Analyzer (TAGA) to scan ambient air in the vicinity of the site. In August 2008, an EPA Contractor (TN & Associates now OTIE) collected eight residential air samples (i.e., sub-slab, crawlspace, and indoor) and 11 ambient air samples. The air samples were submitted for analysis of VOCs. Site-related VOC concentrations in samples collected from residences were below EPA's then-applicable removal action concentrations.

From September 2008 through March 2012, an EPA contractor (OTIE) collected water supply samples on a quarterly basis from water supply wells located within one mile of the site. The water supply well samples were submitted for analysis of VOCs, SVOCs, metals, and cyanide. Site-related compounds were not detected in the water supply samples.

In September and October 2008, CTS's contractor (MACTEC) collected soil and groundwater samples in the vicinity of the springs area east of the site. The samples were used to design an ozone injection pilot study to determine the feasibility of an ozone injection system reducing VOC concentrations in the groundwater that discharges to the springs. The pilot study was conducted from March 2009 through January 2010.

From September 2008 through July 2009, CTS's contractor (MACTEC) conducted Phase I Remedial Investigation activities under the direction of NCDENR. Monitoring wells were installed on- and off-site, and soil, groundwater, and surface water samples were collected during several phases of work. The extent of the VOC groundwater plume was delineated in the overburden (i.e., above bedrock) to the north and south. Analytical results of surface water samples were similar to historical results.

From January 2009 to May 2010, EPA and their contractors conducted a series of studies to collect data for listing the site on the NPL. The North Carolina Geological Survey (NCGS) and the United States Geological Survey also conducted studies in the vicinity of the site to support the NPL listing. Hydrogeologic information, primarily related to groundwater conditions in bedrock, was gathered during these studies.

In December 2010, CTS's contractor (MACTEC) conducted a geophysical investigation to determine if buried sources of contamination (e.g., drums of waste) were located in the southern portion of the site. Several surface geophysical methods were used to survey the area. Buried sources of contamination were not identified.

In October 2012, CTS's contractor (AMEC) conducted vapor intrusion assessment activities at three residences located west of the site. Crawlspace/basement and ambient air samples were collected and analyzed for Site-related VOCs. Concentrations of the detected VOCs were below unacceptable risk levels for residential occupants.

Beginning in January 2013, CTS's contractor (AMEC) began quarterly sampling of water supply wells located within one mile of the site. As of May 2015, 10 quarterly water supply sampling events had been conducted. Water supply samples are analyzed for site- associated VOCs, as well as toluene as requested by EPA. Site-related VOCs have not been detected in the water supply samples.

From September 2013 to February 2014, CTS's contractor (AMEC) conducted a NAPL Investigation at the site. The objective of the NAPL Investigation was to gain an understanding of the nature and extent of NAPL in the overburden at the site. The NAPL Investigation included collection of significant qualitative data using direct sensing methods. Quantitative data (e.g., measurement and analysis of NAPL, soil, and groundwater sample analyses, etc.) was also collected to correlate/confirm the direct sensing data.

In November 2013, CTS's contractor (AMEC) conducted confirmation soil sampling and analysis associated with the SVE system. The objective of the Confirmation Sampling and Analysis Plan (CSAP) was to evaluate the effectiveness of the SVE system at removing VOCs from the unsaturated zone at the site. Comparison of TCE concentrations in pre-removal soil samples to post-removal CSAP soil samples indicates an average TCE percent reduction of 95 percent in unsaturated soil. Concentrations of TCE in the upper 10 feet of soil in the identified source area were below the EPA's Regional Screening Level for industrial soil.

In April 2014, CTS's contractor (AMEC) conducted vapor intrusion assessment activities at three residences located east of the site. Indoor, crawlspace, and ambient air samples were collected and analyzed for site-related VOCs. Concentrations of TCE in the indoor air samples were greater than EPA Region 4's recommended residential indoor air Removal Management Level (RML) of 2 $\mu g/m^3$. This finding resulted in temporary relocation of residents in the eastern springs area, while the vapor removal and capture system was installed as discussed in Section 2.2 above. TCE in indoor air samples were less than EPA's RML following installation of the system, and residents returned to their homes in November 2014.

Based on the eastern springs air sampling results, EPA requested air assessment at additional residences located further northeast and east of the site. Crawlspace, and/or ambient air samples were collected at these outer perimeter residences from June 2014 – April 2015. Concentrations of TCE in the air samples were less than EPA's RML, so no further action was required for the outer perimeter residences.

2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The nine acre former plant site (e.g. within the fence-line) subject to this decision document is vacant and unoccupied as it has been since the mid-1990s. The property is owned by MGRA and currently zoned for commercial/industrial land-use. Future land and resource uses are dependent on site cleanup and are unknown at this time. The groundwater is considered as Class GA or GSA pursuant to NC Groundwater Quality Standards at 15A NCAC 02I.0201, which includes potential water supply for potable usage.

2.7 SUMMARY OF SITE RISKS

The site-wide Remedial Investigation has not been completed yet, and as such comprehensive human health and ecological risk assessments required per CERCLA guidance and the AOC between EPA and CTS have not been conducted. However, groundwater at the site is contaminated with chlorinated solvents such as TCE, cis-1,2-dichloroethane (cis-DCE), and 1,1,1-trichloroethane (TCA). These chemicals are considered hazardous substances under CERCLA. TCE has been detected in groundwater at levels which exceed the EPA drinking water standard (Maximum Contaminant Level) of 5 parts per billion.

These contaminants pose a potential risk to human health and the environment particularly through the air inhalation and/or drinking water exposure pathways. The NAPL/TCE contaminant mass is also a source of the dissolved-phase VOC groundwater contamination. As part of EPA's site management strategy, these potential human health risks have been eliminated by short-term removal actions (e.g. water line extension/filtration systems for drinking water; vapor recovery in eastern springs for air) while this interim source control action can be implemented and the final site-wide remedy can be developed.

This Interim Remedial Action addresses the risks to human health and the environment via source control. If this NAPL/TCE contaminant mass in the saturated thickness above the competent bedrock interface is not remediated, it will continue to migrate toward the eastern/western spring areas and possibly the deeper fractured bedrock. For that reason, the response action selected in this Interim Action ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

2.8 INTERIM REMEDIAL ACTION OBJECTIVES

The general Interim Remedial Action Objective (RAO) for this ROD is to significantly reduce the mass of NAPL and TCE that is the source of the dissolved-phase VOC groundwater plume. Over time, while the final site-wide cleanup plan is developed, the dissolved-phase VOC plume is expected to decrease in size and concentration. The specific RAO for this Interim ROD is:

- Reduce the TCE concentration in the 3.1-acre interim action treatment area by 95%.

For the 1.2-acre ERH treatment area, the 95% reduction of TCE will apply to saturated soil, NAPL, and groundwater. For the 1.9-acre ISCO treatment area, the 95% reduction of TCE will apply to groundwater. Achievement of this RAO will be determined by pre-treatment and post-treatment verification sampling within the 3.1-acre interim action treatment area.

2.9 DESCRIPTION OF ALTERNATIVES

CERCLA § 121(b)(1), 42 U.S.C. § 9621(b)(1), requires remedial actions to be protective of human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. Further, CERCLA § 121(d), 42 U.S.C. § 9621(d), specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains applicable or relevant and appropriate requirements (ARARs) under federal and more stringent state laws, unless a waiver can be justified pursuant to CERCLA § 121(d)(4), 42 U.S.C. § 9621(d)(4).

The NCP at 40 CFR §300.430(e)(7) describes methods for screening cleanup technologies in order to develop applicable remedial alternatives. During the initial development and screening of alternatives, several potentially applicable remedial technologies or process options for addressing NAPL and TCE contaminated saturated soils in the one-acre source area were identified and screened based on effectiveness and technical implementability at the site. Detailed descriptions of technologies, process options, and the five remedial alternatives for addressing the one-acre NAPL/TCE source area can be found in the NAPL Area FFS Study Report, dated July 31, 2015, which is part of the Administrative Record. In accordance with the NCP at 40 C.F.R. § 300.430(e) (6), EPA also evaluated a no action alternative that serves as the baseline for the evaluation of the other remedial alternatives.

As discussed in Section 2.3 and Section 3.0, near the end of the initial 30-day comment period, EPA requested that CTS evaluate treating an expanded area and volume with the Interim Remedial Action. This is consistent with comments that EPA provided on the Draft FFS Report that stated, "*EPA's overarching goal is to maximize the reduction of TCE mass in the subsurface at the CTS site with the forthcoming interim source control action.*" CTS agreed to evaluate two expanded treatment area options, and during the second 30-day comment period submitted an Addendum to the FFS Report to EPA on November 25, 2015. The remedial alternatives evaluated in the initial FFS Report and the FFS Addendum are summarized below.

2.9.1 Remedial Alternatives for the One-Acre NAPL/TCE Source Area

This section describes the remedial alternatives presented in the initial FFS Report. The Draft FFS Report was submitted to EPA on July 31, 2015, and the final FFS Report was submitted on September 10, 2015. The area to be treated by this set of alternatives is the one acre NAPL/TCE source area. The average saturated thickness under this one-acre area was assumed to be 25 feet, which equates to a volume of approximately 40,500 CYs.

Alternative 1: No Further Action

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action alternative does not include any physical remedial measures beyond those removal actions already implemented to address the contamination at the site. This "status quo" alternative assumes nothing would be done in the short term to address the NAPL/TCE source area. The no-action alternative defers all required cleanup work to the final site-wide ROD that is not expected for several years. As such, the cost of this remedial alternative is $0.

Alternative 2: Multi-Phase Extraction (MPE)

Multi-phase extraction (MPE) removes NAPL, groundwater, and soil vapor from the subsurface using vacuum well(s). MPE would involve installation of extraction wells and a system to recover the NAPL. The extracted fluids and vapor would be treated in an aboveground treatment system on-site. After separation, the groundwater would be treated and disposed on-site, while the NAPL would be containerized and disposed off-site. It was assumed that the MPE system would have to operate for a 10-year period. The estimated cost to implement the MPE alternative is $2,670,000.

Alternative 3: Electrical Resistance Heating (ERH)

Electrical resistance heating (ERH) involves heating the subsurface using electrodes installed in the zone of contamination. The electric current passed between the electrodes heats the saturated zone where there is sufficient moisture to conduct electricity. The heat "boils" the NAPL/TCE, and vent wells are used to recover the vapors. The vapors are treated aboveground and discharged to the air. Any NAPL accumulation in the vent wells would be recovered and transported off-site for disposal. It was assumed that 19 months would be required to design, install and fully operate the ERH system to meet the RAO. The estimated cost to implement the ERH alternative is $4,150,000.

Alternative 4: In-Situ Chemical Oxidation (ISCO)

In-situ chemical oxidation (ISCO) involves addition of chemicals into the zone of contamination via injection points. The chemicals oxidize the NAPL/TCE and break down the contaminants into harmless by-products like carbon dioxide and water. ISCO is typically implemented with a primary injection event and one or more polishing injections to reduce contaminant concentrations and mass to the desired level. Chemical oxidation using catalyzed hydrogen peroxide gives off heat, so vent wells would be required to recover vapor and any NAPL. ISCO would require installation of injection wells and an aboveground system to recover and treat vapors. It was assumed that ISCO would require three years to complete, including one primary injection event and two polishing steps. The estimated cost to implement the ISCO alternative is $3,820,000.

Alternative 5: Surfactant Flooding

Surfactant flooding involves injection of a substrate into the zone of contamination to increase the mobility of the NAPL phase. The NAPL and groundwater are then removed from the subsurface via extraction wells. After separation aboveground, the groundwater would be treated and discharged to the municipal sewer system, while the NAPL would be containerized and disposed off-site. Surfactant flooding would require installation of injection/extraction wells and an aboveground treatment system. It was assumed that surfactant flooding would require two years to complete, including a primary flooding event and one follow-up step. The estimated cost to implement the surfactant flooding alternative is $3,520,000.

2.9.2 Remedial Alternatives for the Expanded Northern Treatment Area

This section describes the remedial alternatives presented in the FFS Addendum Report that was submitted to EPA on November 25, 2015. EPA's Proposed Plan (Appendix D) released on September 30, 2015 selected ERH (Alternative 3 above) as the preferred alternative to address the one-acre NAPL/TCE source area. Because of the inclusion of the expanded Northern Area to the Interim Remedial Action scope, a relatively small area of dissolved phase TCE south of the one-acre NAPL/TCE plume will be added to the ERH treatment area. This area is approximately 9,100 square feet (0.21 acres), and the average saturated thickness is about 20 feet. Based on these dimensions, the additional volume is approximately 6,750 CYs. The total NAPL/TCE source area to be remediated by ERH is now 1.2 acres. The total volume to be remediated by ERH is 47,250 CYs. The cost to treat the additional area via ERH is $585,000. Therefore, the cost to treat the 1.2-acre NAPL/TCE source via ERH is $4,735,000.

The expanded Northern Area that was added to the Interim Remedial Action has an areal extent of approximately 82,000 square feet (about 1.9 acres). The bedrock interface of the Northern Area dips substantially. The average saturated thickness of the Northern Area is 53 feet, more than double the average thickness of the 1.2-acre NAPL/TCE source area. The volume of material to be treated in the Northern Area is approximately 161,000 CYs.

Alternative 1: No Further Action

The no action alternative is retained because it provides the baseline for comparing alternatives and it is mandated by Superfund guidance. Under this alternative, the Northern Area would not be included in the Interim Remedial Action scope. Treatment in the Northern Area would be deferred to the final site-wide ROD that is not expected for several years. The cost of the no action alternative is therefore $0.

Alternative 2: Electrical Resistance Heating (ERH)

This is the same cleanup technology EPA selected as the preferred remedy in the October 2015 Proposed Plan for the one-acre NAPL/TCE source area. Therefore, further description of the technology is not provided here.

Implementation of ERH for both the NAPL/TCE source area and the Northern Area at the same time would require power services upgrades such as new power lines, transformers, switches, etc. Upgrading the power grid in the vicinity of the site would require significant time and costs. In addition, there would likely be equipment availability limitations as ERH vendors have a limited number of power control units. For these reasons, ERH for the two areas at the same time was not considered practical.

Materials for implementation of ERH in the NAPL/TCE source area and Northern Area would be mobilized at the same time. Installation of the ERH system and heating of the NAPL/TCE source area would occur first. While the heating effort is underway in the NAPL/TCE source area, electrodes would be installed in the Northern Area. Once treatment confirmation sampling indicates the RAO has been achieved in the NAPL/TCE source area, the surface equipment would be moved and the heating effort in the Northern Area would begin. Implementation of ERH in the NAPL/TCE source area and Northern Area is estimated to take 2.5 years from notice to proceed. The estimated cost for ERH in the Northern Area is $8,700,000.

Alternative 3: In-Situ Chemical Oxidation (ISCO)

ISCO in the Northern Area is essentially the same technology described above for the NAPL/TCE source area. The primary difference in this case is the oxidant selected to destroy the chemicals. For the NAPL/TCE source area, catalyzed hydrogen peroxide was selected in the FFS Report since a more robust oxidant was needed to break down the mixture of NAPL and TCE. This reaction is exothermic, so vent wells would have been required if ISCO was selected for the NAPL/TCE source area.

The expanded Northern Treatment Area contains TCE only in the saturated zone above the top of bedrock. Therefore, potassium permanganate was chosen as the oxidant in the Northern Area. Potassium permanganate is a powerful oxidant that is commonly used to destroy dissolved phase chlorinated VOCs, and it does not require vent wells. Permanganate can be injected as a liquid solution via injection points or emplaced as a solid via hydraulic delivery methods. Solid potassium permanganate, which has a greater oxidation capacity than liquid, was selected for application in the Northern Area.

Solid potassium permanganate is mixed with silica sand and emplaced as a slurry via hydraulic delivery methods. The sand/permanganate slurry has a much higher hydraulic conductivity than the surrounding soil matrix. This zone of high conductivity “draws” groundwater preferentially toward the emplaced permanganate/sand structure. Contaminants in groundwater that migrate through the zone of solid potassium permanganate are then oxidized/destroyed. Also, the potassium permanganate dissolves into the groundwater in the surrounding formation and creates an “oxidative plume” via advection and dispersion. The permanganate will continue to oxidize chemicals until the oxidative capacity is exhausted.

Pilot testing and additional data collection in the Northern Area would be conducted while ERH is taking place at the NAPL/TCE source area. Implementation of ISCO via emplacement of solid permanganate is estimated to take eight to ten months to complete from the notice to proceed. The time to achieve the RAO is estimated to take two to three years after emplacement of the solid potassium permanganate. The estimated cost to implement ISCO in the expanded Northern Area including pre-remediation sampling, performance of a pilot test, drilling, one primary emplacement event of solid permanganate and one polishing step is $4,300,000.

2.10 COMPARATIVE ANALYSIS OF ALTERNATIVES

As part of the remedy selection process, EPA evaluates each proposed remedy against the nine criteria specified in the National Contingency Plan (NCP), 40 CFR §300.430(e)(9)(iii). The selected alternative must satisfy the threshold criteria set out in the NCP. Next, the primary balancing criteria are used to weigh the tradeoffs or advantages and disadvantages of each of the alternatives. The modifying criteria, which are state and community acceptance, are evaluated at the end of the public comment period. This section of the ROD summarizes the nine criteria and the relative performance of each alternative against the nine criteria, noting whether each satisfies the threshold criteria, how each compares with the no action alternative, and whether the state and community support the alternative. A comparative analysis of the alternatives presented above using the nine evaluation criteria follows.

For additional information on the comparison of the remedial alternatives, refer to the FSS Report and FFS Addendum, which are part of the Administrative Record.

Threshold Criteria *- The first two Superfund criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

2.10.1 Overall Protection of Human Health and the Environment

"Overall protection of human health and the environment" evaluates whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

The No-Action alternatives do not provide for overall protection of human health and the environment. For this reason, the No-Action alternatives are not discussed further in this section.

The other alternatives considered do comply with this threshold criteria, with varying degrees. Among the NAPL/TCE source area alternatives, Alternative 3 (ERH) provides the highest level of protection of human health and the environment. This would be followed by Alternative 4 (ISCO) and Alternative 5 (surfactant flooding). Alternative 2 (MPE) is not considered protective of human health and the environment, as it will not meet the RAO. Among the expanded Northern Area alternatives, Alternative 2 (ERH) is considered to provide the highest level of protection, as the technology has demonstrated contaminant removal levels greater than 99 percent.

2.10.2 Compliance with ARARs

Section 121-(d) of CERCLA and Part 300.430(f)(1)(ii)(B) of the NCP require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and more stringent state requirements, standards, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4). "Compliance with ARARs" addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes or provide a basis for invoking a waiver.

Because this is an Interim Remedial Action, EPA is waiving certain ARARs. CERCLA Section 121(d)(4)(A) and Part 300.430(f)(1)(ii)(C)(1) of the NCP allows EPA to select a remedy that does not meet an ARAR if the remedy is an interim measure that will eventually be part of a remedial action that will meet the ARAR. For example, a groundwater remedy in an area where the groundwater is considered a drinking water resource would usually be required to restore the groundwater until it attains the chemical-specific TCE drinking water standard (North Carolina Groundwater Quality Standard) of 3 parts per billion. The chemical-specific ARARs will apply to the final site-wide ROD for the site. This Interim Remedial Action will instead be measured by achievement of the RAO, a 95 reduction of TCE concentration in the 3.1-acre treatment area.

The other ARARs associated with this Interim Action ROD are "Action-specific" and "Location-specific" ARARs, with which the Interim Remedial Action will comply. A complete list of these ARARs are attached as Tables 1 and 2. With the exception of the No-Action alternatives, all of the evaluated alternatives would be compliant with the ARARs listed in Tables 1 and 2.

***Primary Balancing Criteria** - The next five Superfund criteria, three through seven, are known as "primary balancing criteria." These five criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.*

2.10.3 Long-Term Effectiveness and Permanence

"Long-term effectiveness and permanence" considers the ability of an alternative to achieve long-term, effective and permanent protection of human health and the environment over time.

The ERH alternatives would have the highest level of long-term effectiveness and permanence, as a significant portion of the NAPL and TCE mass can be permanently destroyed with limited contaminant "rebound" expected. The ISCO alternatives have also proven successful at other similar applications, although polishing steps are frequently required to deal with residual concentration levels.

2.10.4 Reduction in Toxicity, Mobility, or Volume Through Treatment

"Reduction in toxicity, mobility, or volume (TMV) of contaminants through treatment" evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment and the amount of residual contamination present after treatment.

The ERH alternatives have a higher probability of reducing the TMV of contaminants, as the electrical current creating the heat is not affected by low permeability zones, and thus the entire saturated treatment zone is heated uniformly. With the ISCO alternatives, the oxidant must directly contact the NAPL/TCE for the contaminant to be destroyed. However, the oxidative plumes created via the emplaced potassium permanganate slurry are expected to contact the large majority of the treatment zone. Where monitoring might indicate a particular area is not receiving adequate treatment, additional emplacements could easily be installed. Multi-Phase Extraction and Surfactant Flushing provide much lower reduction in TMV of NAPL and TCE.

2.10.5 Short-Term Effectiveness

"Short-term effectiveness" considers the short-term risk or impact to the community, on-site workers and the environment that may be posed during the construction and implementation of the alternative. All of the alternatives considered can be managed properly to minimize disruption(s) to the community and to provide for adequate protection of on-site workers and the community during construction/implementation.

2.10.6 Implementability

"Implementability" addresses the technical and administrative feasibility of alternative, including the availability of materials and services needed to implement that remedy. All of the alternatives considered are technically and administratively implementable. Pilot tests would be necessary for the ISCO alternatives and surfactant flushing to design full-scale systems.

2.10.7 Cost

"Cost" includes estimated capital and annual operation and maintenance (O&M) costs, as well as present worth cost. Since this in an interim action, long-term O&M costs are not applicable. Rather, costs associated with the remediation time frames were incorporated into the present worth cost estimates provided herein. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent. This is a standard assumption in accordance with EPA guidance.

The estimated costs of the NAPL/TCE source area remedial alternatives ranged from $2,670,000 (MPE) to $4,150,000 (ERH). ERH has the highest capital cost, but there is only one heating effort. ERH technology has the most certainty to achieve the RAO of 95 percent reduction of TCE concentrations. However, ISCO is about $300,000 less expensive and has demonstrated success at achieving the RAO in similar applications.

For the expanded Northern Area, the alternative costs ranged from $4,300,000 for ISCO to $8,700,000 for ERH. The operational costs for ERH (power to heat electrodes) and ISCO (oxidant and emplacement) are essentially the same. The significant difference in cost is primarily due to subsurface drilling requirements, and the deeper depth to bedrock in the Northern Area. For cost estimating purposes, ERH required 262 electrodes versus 59 cased borings for ISCO. In other words, ERH requires about four times more borings to bedrock than ISCO does in the Northern Area. Considering the depth to bedrock, relatively large treatment volume, and the fact that ERH is basically twice as expensive as ISCO for the Northern Area, ISCO is considered to be more cost-effective for the expanded treatment area.

***Modifying Criteria** - The final two evaluation criteria, eight and nine, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.*

2.10.8 State Agency Acceptance

"State/Support agency acceptance" considers whether the state and/or support agency concurs with, opposes, or has no comment on the Preferred Alternative.

The State of North Carolina concurs with the selected remedy identified in this Interim Action ROD (Appendix A).

2.10.9 Community Acceptance

"Community acceptance" considers whether the public agrees with, opposes, offers different alternatives, or has no comment on the Preferred Alternative described in the Proposed Plan. Comments received on the Proposed Plan are an important indicator of community acceptance.

As discussed in more detail below in Section 3.0 (Responsiveness Summary), EPA received substantial support from the community regarding the preference to maximize the effectiveness of the Interim Remedial Action and expand the treatment area and volume. Appendix B includes the verbatim transcript of the October 13, 2015 public meeting. Redacted copies of all public comments received during the 60-day public comment period are attached as Appendix C.

2.11 PRINCIPAL THREAT WASTES

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP § 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. The EPA selected remedy described below in Section 2.12 does treat source materials in the 1.2-acre NAPL/TCE source area plus the 1.9-acre expanded Northern Treatment Area. Therefore, this Interim Action ROD does satisfy the statutory preference for treatment of principal threat wastes.

2.12 SELECTED REMEDY

EPA has selected ERH to treat the 1.2-acre NAPL/TCE source area and ISCO to treat the 1.9-acre expanded Northern Area (total 3.1 acres). ERH will treat an estimated 47,250 CYs of saturated material, while ISCO will treat approximately 161,000 CYs of saturated material (total 208,250 CYs).

ERH in the NAPL/TCE Source Area

ERH will involve heating the subsurface using electrodes installed in the 1.2 acre zone of NAPL/TCE contamination. An alternating current voltage will be applied to the electrodes, which will generate an electric current. The electric current causes heating of the subsurface that will volatize the TCE. TCE vapors will be recovered from vent wells that are located adjacent to the electrodes. The vapors will then be treated aboveground and discharged to the atmosphere. Condensate from the vapors will also be collected and treated. The treated condensate will be used to provide “drip water” to the electrodes or will be discharged to the sanitary sewer system.

Heating occurs in the saturated zone where there is sufficient moisture to conduct electricity. Temperature monitoring points will be installed at multiple depths to monitor the target temperature in the subsurface. Borings for the electrodes will be installed using hollowstem augers. Borings will be advanced to top of bedrock (e.g auger refusal) and the electrode and vent well installed. It is estimated that up to 200 electrodes and co-located vent wells will be installed in ERH treatment area.

The ERH bench test conducted during implementation of the FFS effort indicated that ERH could reduce TCE concentrations up to 99 percent. Therefore, EPA has a high degree of confidence that ERH can achieve the RAO of 95% reduction of TCE concentration in saturated soil, NAPL, and groundwater. Implementation of ERH in the 1.2-acre source zone is expected to take 19 to 21 months, with an estimated five months of subsurface heating. A pre-treatment and post-treatment sampling and analysis plan will be developed to determine when a 95% reduction of TCE has been achieved. The heating effort will continue until treatment effectiveness monitoring indicates the RAO has been achieved.

ERH is safe to site workers and the community, as ERH work is performed with numerous safeguards. Isolation transformers allow electricity to flow only between electrodes within the work area. Thus, electricity cannot travel beyond the ERH treatment area. Monitoring and engineering controls will be implemented to protect workers and the community. Engineering controls will be used to prevent contaminated materials from migrating with surface water runoff or becoming airborne during construction. Air monitoring will be implemented during construction activities that come into contact with contaminated media to ensure workers wear the proper protective equipment for the level of contamination present. Air and wastewater discharge monitoring will also be implemented to ensure that contaminants being discharged do not exceed applicable standards and are protective of the surrounding community.

The cost to implement ERH in the 1.2-acre NAPL/TCE source area is estimated at $4,735,000. The cost estimate for ERH from the FFS Report is provided below for reference. The actual ERH implementation cost will be refined during the Request for Proposal (RFP) stage.

Estimate of Costs for Electrical Resistivity Heating
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Amec Foster Wheeler Project 6252-12-0006

Item	Estimated Cost	Comment/Assumtion
Design, work plan	$175,000	
Monitoring well installation	$80,000	10 monitoring well pairs (stainless steel)
Pre-remediation sampling/analysis	$30,000	sample soil, LNAPL, and groundwater
Mobilization of electrode materials	$595,000	
Drilling	$650,000	157 co-located electrodes and vent wells; 18 temperature monitoring points; includes waste disposal
Subsurface installation/oversight	$245,000	
Surface installation and start-up	$430,000	
System operation	$1,800,000	5 months of heating
Confirmation sampling	$40,000	includes sampling during remediation
Demobilization and well abandonment	$105,000	does not include abandonment of monitoring wells to be used in future monitoring
Total estimated cost	**$4,150,000**	

Note: This cost table does not include the additional 0.21 acres and 6,750 CYs of volume added to the NAPL/TCE source area in the FFS Addendum. The total NAPL/TCE source area to remediated by ERH is now 1.2 acres. The total volume to be remediated by ERH is 47,250 CYs. The cost to treat the additional area via ERH is $585,000. Therefore, the total cost to treat the 1.2-acre NAPL/TCE source via ERH is $4,735,000.

ISCO in the Expanded Northern Area

ISCO will be employed to treat TCE impacted groundwater in the expanded 1.9-acre Northern Area. ISCO will involve emplacement of oxidant chemical substances into the contaminated zones of the treatment area to breakdown the TCE. As discussed in Section 2.9.2, the FFS Addendum selected solid potassium permanganate as the oxidant since it has a greater oxidation capacity than the liquid form.

Solid potassium permanganate will be mixed with silica sand and emplaced as a slurry via hydraulic delivery methods. Depending on the soil characteristics and the amount of oxidant required, the emplaced slurry is typically less than an inch thick and has a radius ranging from 15 to 25 feet from the emplacement point. The sand/permanganate slurry has a much higher hydraulic conductivity than the surrounding soil matrix. This zone of high conductivity creates a preferential flow pathway toward the oxidant. TCE contaminated groundwater will migrate through the zone of solid potassium permanganate and become oxidized/destroyed. Also, the potassium permanganate dissolves into the groundwater in the surrounding formation and creates an oxidative plume via advection and dispersion. The permanganate will continue to oxidize chemicals until the oxidative capacity is exhausted.

Solid polyvinyl chloride (PVC) casings will be installed to the depth of refusal using sonic drilling techniques. An eight-inch diameter borehole will be created, a four-inch casing installed, and the annulus of the boring backfilled with cement grout. Once the cement grout has fully cured, the PVC casing will be cut using a high-pressure jetting tool at specified intervals. The solid potassium permanganate will be mixed with sand and a small amount of bentonite will be added to keep the solids in suspension during emplacement. The permanganate/sand slurry will be emplaced via hydraulic delivery methods. A packer system will be used to isolate the emplacement interval. The permanent casings allow for subsequent reagent emplacements or injection of water or other amendments to the existing emplacements, if necessary. For cost estimating purposes, it was assumed that 59 borings would be installed in the Northern Area, spaced 30 to 40 feet apart. It was also assumed that each boring would receive four to six emplacements in the targeted zones.

ISCO has proven successful in achieving TCE reductions greater than 95 percent at other sites with similar subsurface conditions. After ERH in the NAPL/TCE source area, much lower concentrations of dissolved-phase VOCs will migrate to the Northern Area. The potassium permanganate present in the Northern Area will be available to provide additional, ongoing treatment for this migrating groundwater. Concentrations of TCE in the downgradient, dissolved-phase plume discharge zones east and west of the site would be expected to decline after implementation of ERH and ISCO. Implementation of ISCO via emplacement of solid permanganate is estimated to take eight to 10 months. The time to reach the RAO is estimated to take two to three years after the initial treatment event. As with any injection/emplacement project, it is expected that some areas in the Northern Area will require additional treatment. A pre-treatment and post-treatment sampling and analysis plan will be developed to verify that the RAO has been achieved. Additional emplacement events will be conducted until the RAO is achieved, or an alternate strategy is developed.

Permanganate can migrate beyond the emplacement location. A contingency plan will be developed to ensure the permanganate does not discharge to the eastern and western spring areas. Contingency monitoring wells will be installed between the Northern Area and the discharge zones and the oxidation reduction potential (ORP) of the groundwater will be monitored. Significant increases in ORP or visual presence of permanganate in a well are indicative that permanganate is migrating. If such conditions are identified, control measures will be implemented to neutralize the groundwater before it reaches the surface water discharge zones.

Monitoring and engineering controls will be implemented to protect workers and the surrounding community. Engineering controls will be used to prevent contaminated materials from migrating with surface water runoff or becoming airborne during construction. Air monitoring will be conducted during construction activities that come into contact with contaminated media to ensure workers wear the proper protective equipment for the level of contamination present.

From a construction sequencing perspective, ERH in the 1.2-acre NAPL/TCE area will occur first. While the ERH work proceeds, additional data will be collected in the Northern Area to better characterize the horizontal and vertical extent of contamination in the overburden. This data will aid in identifying potential “hot spots” and refine the area and volume of the treatment zone for full-scale system design. Pilot testing will also be conducted at this time. Pilot testing will determine the radius of influence of the emplaced slurry, evaluate the amount of oxidant required, and evaluate contaminant reductions in nearby monitoring wells. ISCO in the Northern Area will start when ERH is completed and a contract has been awarded for the ISCO full-scale design.

EPA anticipates that the Interim Remedial Action will lead to decreasing TCE concentration trends in the bedrock aquifer. It is important to establish a good baseline of the “pre-treatment” quality of the bedrock aquifer conditions. For that reason, a bedrock aquifer monitoring plan will be developed and implemented concurrent with the Interim Action source control work.

The cost to implement ISCO in the 1.9-acre Northern Area is estimated at $4,300,000. The cost estimate for ISOC from the FFS Addendum is provided below for reference. The actual ISCO implementation cost will be refined after additional data collection, the pilot test, and during the Request for Proposal (RFP) stage. The total estimated cost to implement EPA’s selected remedy as described in this section is $9,035,000.

Estimate of Costs for In-situ Chemical Oxidation for the Northern Area
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina
Amec Foster Wheeler Project 6252-12-0006

Item	Estimated Cost	Comment/Assumtion
Monitoring well installation	$60,000	10 monitoring well pairs (PVC)
Pre-remediation sampling/analysis	$10,000	sample groundwater from monitoring wells
Pilot test	$160,000	
Full-scale design	$20,000	
Casing installation	$400,000	59 cased borings; includes waste disposal (cuttings from below the water table are considered hazardous)
Reagent (solid potassium permanganate)	$1,330,000	
Reagent emplacement	$1,850,000	286 emplacements, oversight, equipment
Contingency monitoring	$20,000	monitor oxidation reduction potential between remediation area and discharge zones
Confirmation sampling	$20,000	includes sampling during remediation
Additional reagent emplacement	$400,000	one additional treatment, as needed based on monitoring.
Casing abandonment and documentation	$30,000	does not include abandonment of monitoring wells to be used in future monitoring
Total estimated cost	**$4,300,000**	

2.13 STATUTORY DETERMINATIONS

Based on the information currently available, EPA believes the selected alternative for this Interim Remedial Action meets the Threshold Criteria and provides the best balance of tradeoffs among the other alternatives with respect to the Balancing and Modifying Criteria. EPA expects the selected remedy to satisfy the following statutory requirements of CERCLA Section 121(b):

- Be protective of human health and the environment;
- Comply with all ARARs unless a waiver is justified under CERCLA Section 121(d)(4);
- Be cost effective, and;
- Use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

2.13.1 Protection of Human Health and the Environment

The selected Interim Remedial Action is a source control action that protects human health and the environment by reducing TCE concentrations by 95% and by removing a known source of groundwater contamination. Previous removal actions have been implemented for drinking water supply and for ambient air emissions at the eastern springs area. The final “site-wide” ROD will address any remaining unacceptable risks posed to human health and the environment posed by residual NAPL/TCE mass in the subsurface not addressed by this Interim Remedial Action.

2.13.2 Compliance with ARARs

This interim remedy will comply with the "Action-specific" and "Location-specific" ARARs listed in Tables 1 and 2, respectively. However, because this in an Interim Remedial Action, EPA is waiving the "chemical-specific" ARARs. Part 300.430(f)(1)(ii)(C)(1) of the NCP allows EPA to select a remedy that does not meet an ARAR if the remedy is an interim measure that will eventually be part of a remedial action that will meet the ARAR. Chemical-specific ARARs will apply to the final "site-wide" ROD. This Interim Remedial Action will instead be measured by achievement of the RAO, a 95 reduction of TCE concentration in the 3.1-acre treatment area.

2.13.3 Cost Effectiveness

EPA has determined that the selected remedy is cost-effective and that the overall protectiveness of the remedy is proportional to the overall cost. As specified 40 CFR §300.430(f)(1)(ii)(D), the cost-effectiveness of the Selected Remedy was assessed by comparing the protectiveness of human-health and the environment in relation to three balancing criteria (i.e., long-term effectiveness and permanence; reduction in toxicity, mobility, and volume; and short-term effectiveness) with the other alternatives considered.

2.13.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to Maximum Extent Practicable

EPA has determined that the selected Interim Remedial Action represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practical manner at this portion of the site. The selected interim source control remedy is protective of human health and the environment, complies with ARARs (except "chemical specific" ARARs). EPA has determined that the selected Interim Remedial Action provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the preference for treatment as a principal element, as well as state and community acceptance. The selected remedy employs ERH and ISCO to treat known source materials to achieve a 95% reduction in TCE concentrations thereby achieving long-term effectiveness.

2.13.5 Preference for Treatment as a Principal Element

The Interim Remedial Action employs ERH to treat the 1.2-acre NAPL/TCE source area, and ISCO to treat the 1.9-acre Northern Area. By utilizing treatment as a significant portion of the selected remedy, which will greatly reduce the volume of TCE mass, the statutory preference for remedies that employ treatment as a principal element is satisfied. Such treatment will also reduce the overall toxicity and mobility by significantly removing TCE mass that is serving as a source of dissolved phase groundwater contamination.

2.13.6 Five-Year Review Requirements

The NCP §300.430(f)(4)(ii) requires a Five-Year Review if the remedial action results in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. Therefore, a Five-Year Review will be conducted within five years after initiation of the Interim Remedial Action to ensure that the remedy is, or will be, protective of human health and the environment.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

EPA's October 2015 Proposed Plan identified ERH as the preferred alternative for the one-acre NAPL/TCE source area. However, EPA indicated in the Proposed Plan that it was: (1) evaluating the feasibility of expanding the Interim Remedial Action treatment area to include TCE mass in the groundwater north of there, near monitoring well clusters MW6/MW7; and (2) considering ISCO as one of the remedial alternatives that satisfied all of the statutory requirements of CERCLA.

This Interim Action ROD selects a remedy that expands the area and volume to be treated and adds ISCO as the method of treatment for the expanded area. Section 117(b) of CERCLA requires EPA to document in the ROD any significant changes between the remedy proposed in the Proposed Plan and the remedy selected in the ROD. That same section of the law requires EPA to consider whether the public could have reasonably anticipated those changes. For this interim remedy, the public not only could have anticipated the changes, but the public was one of the driving forces behind the changes.

As discussed below in Section 3.0, EPA received overwhelming support from the community regarding the preference to maximize the effectiveness of the Interim Remedial Action by expanding the treatment area and volume. Based on that response, EPA requested that CTS evaluate remediation strategies for the expanded Northern Area during the 30 day extension to the initial public comment period. CTS agreed and submitted a FFS Addendum that evaluated ERH and ISCO remediation strategies for the expanded 1.9-acre Northern Area.

The biggest difference between the remedies described in the October 2015 Proposed Plan and the February 2016 Interim Action ROD is that EPA has added ISCO to the interim remedy to treat approximately 161,000 CYs of saturated material in the 1.9 acre Northern Area. Groundwater in the Northern Area contains concentrations of TCE ranging from hundreds of parts per billion to tens of thousands parts per billion. As noted during the NAPL investigation, concentrations of TCE vary horizontally and vertically in groundwater in the Northern Area. The one significant advantage ISCO has over ERH, is the ability to isolate and treat those more permeable layers with "hot spots" of TCE. As discussed in Section 2.10.7, the cost of ERH in the Northern Area is more than double the cost to implement ISCO (e.g. $8.7 Million vs. $4.3 Million). EPA selected ISCO for the Northern Area because it has demonstrated success in achieving the RAO and is more cost-effective than ERH. ERH remains a component of the interim remedy to treat the 1.2-acre NAPL/TCE source area.

This decision represents a threefold increase in the area and a fivefold increase in the volume of material to be treated via the Interim Remedial Action. While this more than doubles the initial cost of the interim remedy (e.g. $4.15 million to $9.035 million), EPA strongly believes the "now versus later" remediation approach is more cost-effective in the long-term and will expedite the site-wide cleanup. Furthermore, this expansion was contemplated in the Proposed Plan, discussed extensively at the public meeting, and overwhelmingly supported by the public.

3.0 THE RESPONSIVENESS SUMMARY

This Responsiveness Summary is required by Section 117 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, more commonly known as Superfund) and Sections 300.430(f)(3)(i)(F) and 300.430(f)(5)(iii)(B) of the National Contingency Plan (NCP). This section of the ROD provides a summary of comments received from the public, the North Carolina Department of Environmental Quality (Support Agency) and from the CTS Corporation (Potentially Responsible Party). It also documents for the record how public comments were integrated into the remedy decision making process for the site.

EPA released the Proposed Plan for Interim Remedial Action to the public on September 30, 2015 and held the initial 30 day public comment period from October 1 through October 30, 2015. EPA sponsored a public meeting on October 13, 2015, at the T.C. Roberson High School Auditorium to present the details of the Proposed Plan. The meeting started just after 6:00pm and concluded at approximately 8:41pm. An estimated 60 people attended the public meeting. The verbatim transcript of the October 13th public meeting is included as Appendix B to this Interim Action ROD.

Near the end of the initial 30-day public comment period, EPA noted that the majority of comments received encouraged EPA to expand the proposed one-acre treatment area to include additional acreage to the north near monitoring well clusters MW6 and MW7. EPA discussed the community's comments with representatives of CTS Corporation, and as a result, CTS requested a 30-day extension to the initial comment period. EPA agreed with this request and extended the public comment period an additional 30 days through November 29, 2015. During the extension, CTS prepared an Addendum to the Focused Feasibility Study (FFS) that evaluated Electrical Resistance Heating (ERH) and In-Situ Chemical Oxidation (ISCO) for the expanded treatment area north near MW6/MW7. On November 25, 2015, the FFS Addendum was submitted to EPA by Amec Foster Wheeler, on behalf of CTS Corporation.

Comments Received from the Community

During the 60-day period, a total of 108 public comments were submitted to Craig Zeller, EPA's Remedial Project Manager (RPM) in the Region 4 Superfund Division. Ninety-two comments were submitted via email, and the other 16 comments were received via regular U.S. Mail. Approximately 38 comments (≈ 35%) were received from people who live in close proximity to the CTS site. This subset includes two private property owners located immediately east and west of the site, residents of Southside Village/Southside Estates, and others who listed 28803 as their ZIP code. Redacted copies of all comments received during the 60 day public comment period are included as Appendix C to this Interim Action ROD.

EPA received comments from several federal, state and local elected officials. United States Congressman Patrick McHenry provided written comments in a letter dated October 21, 2015. Heather McTeer Toney, EPA Region 4 Administrator, issued a formal written reply to Congressman McHenry on December 4, 2015. Mr. Terry Van Duyn, North Carolina State Senator from the 49th District (Buncombe County), provided written comments in correspondence dated October 28, 2015. Three Buncombe County Commissioners submitted comments to EPA; David Gantt, Chairman; as well as Miranda DeBruhl and Joe Belcher from the 3rd District. EPA also received comments from four community groups consisting of the POWER Action Group (TAG recipient), Clean Water for North Carolina, Physicians for Social Responsibility (Western NC Chapter), and Mountain True. All of this correspondence can be found in Appendix C of this Interim Action ROD.

In general, all but two of the comments received encouraged EPA to expand the scope of the proposed Interim Remedial Action to include the high concentrations of TCE in overburden groundwater near monitoring well clusters MW6/MW7. The two anomalies suggested that EPA "encapsulate the waste in bricks", or "dig up the whole 9 acres". EPA does not consider either of these alternatives to be effective and/or practical. The ≈ 98% of commenters in favor of expanding the treatment area cited many common themes behind that preference including:

- Expanding the treatment area with the Interim Remedial Action would be more cost-effective, would require less overall time, and would expedite beneficial re-use of the former CTS plant site;
- If not treated with the Interim Remedial Action, TCE in the overburden groundwater near MW6/MW7 will continue to migrate toward springs located east and west of the CTS site;
- EPA has taken too long to implement a comprehensive cleanup of the CTS site, and the community should not be asked to wait any longer. Implement an effective cleanup now, not later; and
- CTS has the resources to conduct a comprehensive cleanup via the Interim Remedial Action approach. EPA should use all its existing Superfund enforcement authority to expand the treatment area without further delay.

The community also presented a number of common questions regarding implementation of the Interim Remedial Action. These questions are listed below, followed by EPA's response:

Question: How will EPA ensure that the method is successful? What before and after measurements will EPA require?

Answer: The Remedial Action Objective (RAO) for this Interim Remedial Action is a 95% reduction of TCE concentrations in saturated soil, NAPL and groundwater. Pre-treatment concentrations of TCE in those media will be established as a baseline. Treatment via ERH and ISCO will continue until quantitative measurements indicate that the 95% TCE reductions have been achieved.

Question: What will be done if the method does not work as intended?

Answer: EPA has a high level of confidence in the efficacy of ERH. The subsurface heating effort between the observed water table and top of bedrock will be sustained until sampling and analysis indicates the RAO has been achieved. ISCO is also a proven remediation technology with success in reducing TCE in similar subsurface conditions. The primary injection event is often times not sufficient in reaching the desired TCE reductions. Follow-up, polishing injection event(s) will be conducted until the RAO is achieved. In the unlikely event that neither ERH or ISCO works sufficiently, EPA has the authority to amend this ROD to select a new or different remedy to address the risks posed by the contamination at the site.

Question: What will be done to make sure that the vaporized TCE does not escape and contaminate air in our community?

Answer: ERH is conducted under negative pressure so all vapors will be collected via recovery wells underground. The collected vapors will be treated aboveground before being discharged to the air. Perimeter air monitoring will be conducted on-site as a safeguard to ensure ambient air quality is not adversely impacted during remediation, which is important not only to nearby residents, but also to workers at the site.

Question: Where will the toxins extracted and separated out by this cleanup process be taken for disposal? Does the community have the opportunity to comment on the disposal location?

Answer: Any NAPL accumulation in the vent wells will be recovered and transported off-site for disposal. The disposal site has not been selected, and will not be determined until the Remedial Design phase. The disposal site will be an EPA approved facility that is permitted to receive this kind of waste. The community does not have the opportunity to comment on the off-site disposal location, but EPA will convey that information once a disposal location has been selected. Off-site transfers of CERCLA wastes must comply with the Off-Site Rule described in the NCP at 40 C.F.R. Part 300.440.

Question: Will EPA and CTS be able to keep investigating and characterizing the deeper areas of TCE while this interim action is going on? When will work begin on the site-wide remedy?

Answer: Yes, EPA plans to further study the deep bedrock issue concurrent with the TCE source control cleanup action in 2016. It is important to understand and document the baseline conditions of the deep-bedrock aquifer pre-treatment, as EPA expects the Interim Remedial Action will lead to decreasing concentration trends over time. Work on the site-wide remedy has already been initiated in the form of expediting the Western Area characterization effort.

Comments Received from CTS Corporation

Near the end of the initial 30-day comment period, EPA requested that CTS evaluate remedial alternatives for the high concentrations of TCE in groundwater located north near monitoring wells MW6/MW7. This request was based on technical review comments provided by EPA in August 2015 on the Draft FFS Report, as well as public comments that encouraged EPA to expand the scope of the Interim Remedial Action. CTS agreed to conduct that evaluation and Amec

Foster Wheeler submitted the FFS Addendum to EPA on November 25, 2015. The FFS Addendum was distributed by EPA to the site community email list on December 3, 2015. The FFS Addendum is included in the Administrative Record.

The FFS Report Addendum evaluates the use of ERH and ISCO to treat the expanded area to the north near MW6/MW7. It is important to note that this expanded area more than doubles the one acre treatment area and 40,500 cubic yard (CY) volume proposed for ERH in the original Proposed Plan for Interim Remedial Action. The original one acre source area, and expanded treatment area to the north is shown on Figure 2 of the FFS Addendum. The area to be addressed by the FFS Addendum increased threefold from one acre to three acres, while the volume increased fivefold from 40,500 CYs to more than 200,000 CYs. The primary reason for the large volume increase is that the bedrock surface dips to the north and increases the saturated thickness to be treated. The estimated cost to treat the expanded area by ERH is $8.7 million, for a total cost of $13.435 million including the original area. The estimated cost to treat the expanded area by ISCO is $4.3 million, for a total cost of $9.035 million.

In Section 5.0 of the FFS Addendum, AMEC Foster Wheeler identifies ISCO as the preferred and recommended remedial alternative to address the expanded area to the north. Therefore, CTS proposed to use ERH to treat the original NAPL/TCE source area, and ISCO to treat the expanded area at an estimated cost of $9.035 million. EPA's response to comments received from CTS Corporation was to allow the additional 30 days for public comment, to consider the additional information provided, and ultimately to adopt the recommended alternative.

Comments from the North Carolina Department of Environmental Quality (NC DEQ)

The NCP requires EPA to consult with NC DEQ as the Support Agency for this Interim Remedial Action. NC DEQ has been regularly consulted and actively involved throughout this remedy selection process, and has reviewed all the supporting and relevant documentation related to the Interim Remedial Action. NC DEQ concurs with the expanded scope of the Interim Remedial Action that involves ERH treatment for the original FFS source area, followed by ISCO for the expanded Northern Area. A letter of concurrence from NC DEQ is attached as Appendix A.

Conclusion

EPA has considered the overwhelming support received from the community regarding the preference to maximize the effectiveness of the Interim Remedial Action and expand the treatment area and volume. EPA also acknowledges CTS's willingness to respond to the request from EPA and to comments received from the community by submitting a FFS Addendum that evaluated 2 remediation strategies for the expanded Northern Area. In consideration of the above, EPA has selected an expanded treatment alternative for the Interim Remedial Action that involves ERH for the 1.2-acre NAPL/TCE source area, plus ISCO for expanded treatment at the 1.9-acre Northern Area. Further details regarding the selected remedy can be found in Section 2.12 of the Interim Action ROD. Section 2.14 of the Interim Action ROD also provides an explanation of the differences between the original Proposed Plan and the expanded remedy EPA selected.

FIGURES

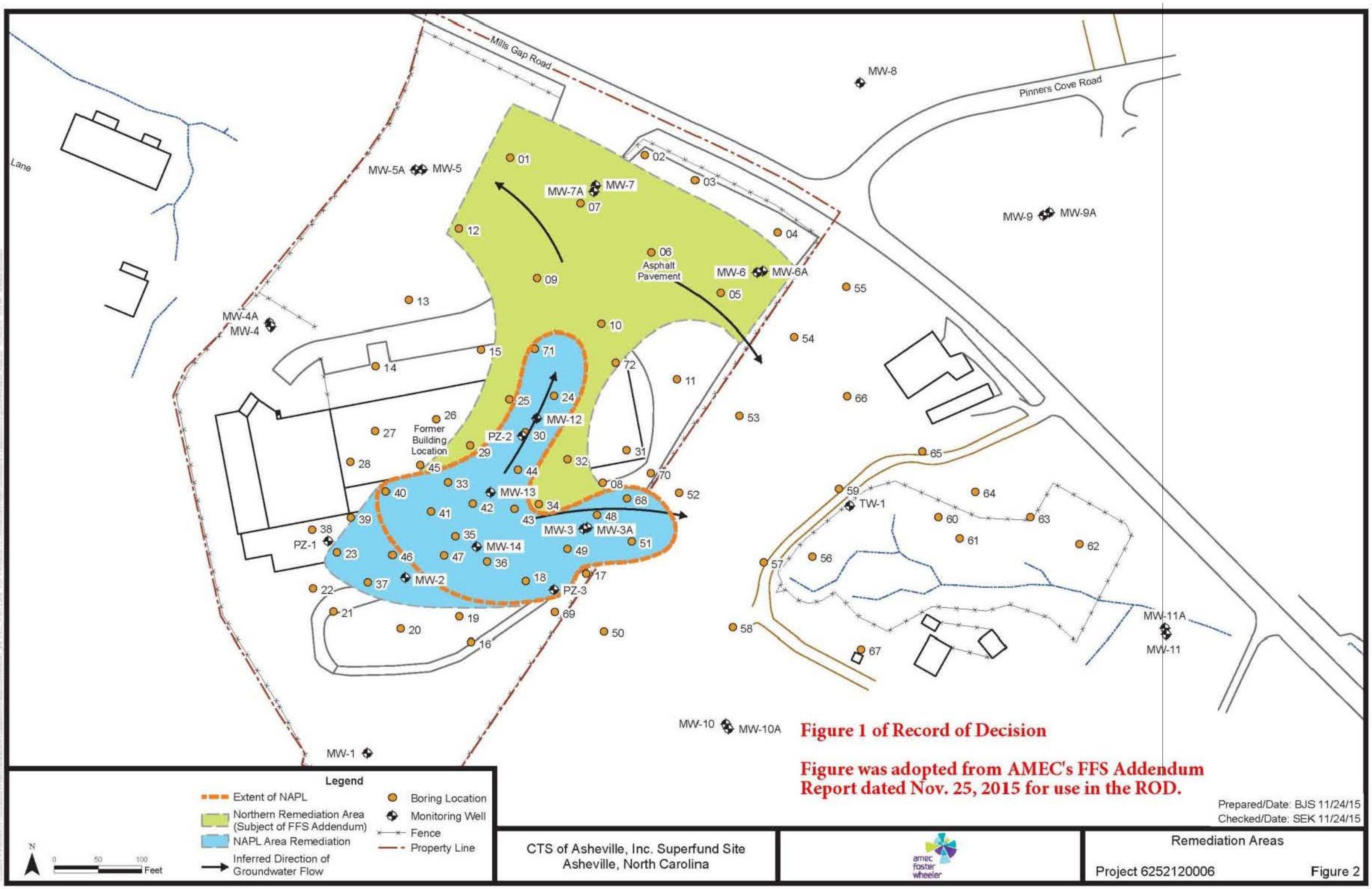

Figure 1 of Record of Decision

Figure was adopted from AMEC's FFS Addendum Report dated Nov. 25, 2015 for use in the ROD.

TABLES

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
General Construction Standards--All Land-Disturbing Activities (i.e., Excavation, Clearing, Grading)			
Managing fugitive dust emissions	Shall not cause or allow fugitive dust emissions to cause or contribute to substantive complaints, or visible emissions in excess of that allowed under paragraph (e) of this Rule.	Activities within facility boundary that will generate fugitive dust emissions--**relevant and appropriate**	15A NCAC 02D.0540(c)
	Implement methods (e.g. wetting dry soils and keeping roads clean of soil) to control dust emissions that could travel beyond the facility boundary.		15A NCAC 02D.0540(g)
Monitoring Well Installation and Operation			
Construction of groundwater monitoring well(s)	Shall not locate, construct, operate, or repair in any manner that may adversely impact the quality of groundwater.	Installation of wells (including temporary) other than for water supply--**applicable**	15A NCAC 02C.0108(a)
	Shall be located, designed, constructed, operated and abandoned with materials and by methods which are compatible with the chemical and physical properties of the contaminants involved, specific site conditions, and specific subsurface conditions.	**applicable**	15A NCAC 02C.0108(c)
	Monitoring well and recovery well boreholes shall not penetrate to a depth greater than the depth to be monitored or the depth from which contaminants are to be recovered. Any portion of the borehole that extends to a depth greater than the depth to be monitored or the depth from which contaminants are to be recovered shall be grouted completely to prevent vertical migration of contaminants.	**applicable**	15A NCAC 02C.0108(d)
	The well shall not hydraulically connect: (1) separate aquifers; or (2) those portions of a single aquifer where contamination occurs in separate and definable layers within the aquifer.	**applicable**	15A NCAC 02C.0108(e)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	The well construction materials shall be compatible with the depth of the well and any contaminants to be monitored or recovered.	Installation of wells (including temporary) other than for water supply **- applicable**	15A NCAC 02C.0108(f)
	The well shall be constructed in such a manner that water or contaminants from the land surface cannot migrate along the borehole annulus into any packing material or well screen area.	**applicable**	15A NCAC 02C.0108(g)
	Packing material placed around the screen shall extend at least one foot above the top of the screen. Unless the depth of the screen necessitates a thinner seal, a one foot thick seal, comprised of chip or pellet bentonite or other equivalent material, shall be emplaced directly above and in contact with the packing material.	**applicable**	15A NCAC 02C.0108(h)
	Grout shall be placed in the annular space between the outermost casing and the borehole wall from the land surface to the top of the bentonite seal above any well screen or to the bottom of the casing for open end wells. The grout shall comply with Paragraph (e) of Rule .0107 of this Section except that the upper three feet of grout shall be concrete or cement grout.	**applicable**	15A NCAC 02C.0108(i)
	All wells shall be grouted within seven days after the casing is set. If the well penetrates any water-bearing zone that contains contaminated or saline water, the well shall be grouted within one day after the casing is set.	**applicable**	15A NCAC 02C.0108(j)
	Shall be secured with a locking well cap to ensure against unauthorized access and use.	**applicable**	15A NCAC 02C.0108(k)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	Shall be equipped with a steel outer well casing or flush-mount cover, set in concrete, and other measures sufficient to protect the well from damage by normal site activities.	Installation of wells (including temporary) other than for water supply **- applicable**	15A NCAC 02C.0108(l)
	Any well that would flow under natural artesian conditions shall be valved so that the flow can be regulated.	**applicable**	15A NCAC 02C.0108(m)
	The well casing shall be terminated no less than 12 inches above land surface unless all of the following conditions are met: (1) site-specific conditions directly related to business activities, such as vehicle traffic, would endanger the physical integrity of the well; and (2) the well head is completed in such a manner so as to preclude surficial contaminants from entering the well.	**applicable**	15A NCAC 02C.0108(n)
	Shall have permanently affixed an identification plate. The identification plate shall be constructed of a durable, waterproof, rustproof metal or other equivalent material and shall contain the following information: (1) well contractor name and certification number; (2) date well completed; (3) total depth of well; (4) a warning that the well is not for water supply and that the groundwater may contain hazardous materials; (5) depth(s) to the top(s) and bottom(s) of the screen(s); and (6) the well identification number or name assigned by the well owner.	**applicable**	15A NCAC 02C.0108(o)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	Shall be developed such that the level of turbidity or settle able solids does not preclude accurate chemical analyses of any fluid samples collected or adversely affect the operation of any pumps or pumping equipment.	Installation of wells (including temporary) other than water supply wells **- applicable**	15A NCAC 02C.0108(p)
	Shall be constructed in such a manner as to preclude the vertical migration of contaminants within and along the borehole channel.	**applicable**	15A NCAC 02C.0108(s)
Implementation of groundwater monitoring system	Shall be constructed in a manner that will not result in contamination of adjacent groundwaters of a higher quality.	Installation of monitoring system to evaluate effects of any actions taken to restore groundwater quality, as well as the efficacy of treatment--**applicable**	15A NCAC 02L.0110(b)
Maintenance of groundwater monitoring well(s)	Every well shall be maintained by the owner in a condition whereby it will conserve and protect groundwater resources, and whereby it will not be a source or channel of contamination or pollution to the water supply or any aquifer.	Installation of wells (including temporary wells) other than for water supply--**applicable**	15A NCAC 02C.0112(a)
	All materials used in the maintenance, replacement, or repair of any well shall meet the requirements for new installation.	**applicable**	15A NCAC 02C.0112(c)
	Broken, punctured, or otherwise defective or unserviceable casing, screens, fixtures, seals, or any part of the well head shall be repaired or replaced, or the well shall be abandoned pursuant to 15A NCAC 02C .0113.	**applicable**	15A NCAC 02C.0112(d)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	No well shall be repaired or altered such that the outer casing is completed less than 12 inches above land surface. Any grout excavated or removed as a result of the well repair shall be replaced in accordance with Rule15A NCAC 02C.0107(f).	**applicable**	15A NCAC 02C.0112(f)
Underground Injection Well Installation and Operation			
Construction of injection well(s) for in-situ treatment of groundwater	Shall not be constructed, operated, maintained, converted, plugged, abandoned, or conducted in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water if the presence of that contaminant may cause a violation of any applicab+B32le groundwater quality standard specified in Subchapter 02L or may otherwise adversely affect human health.	Installation of a Class 5 underground injection well (In-Situ Groundwater Remediation Well)-- **applicable**	40 CFR § 144.12 15A NCAC 02C.0211(c)
	Shall follow the procedures, methods, specified materials, and requirements specified in the subparagraphs 3 through 24 of this Rule.	**applicable**	15A NCAC 02C.0225(g)(3) - (24)
Location of injection well(s) for in-situ treatment of groundwater	Shall not be located in an area generally subject to flooding. Areas which are generally subject to flooding include those with concave slope, alluvial or colluvial soils, gullies, depressions, and drainage ways.	Installation of a Class 5 underground injection well (In-Situ Groundwater Remediation Well)-- **applicable**	15A NCAC 02C.0225(g)(1)
Injection of substances into underground well	Groundwater remediation wells used to inject additives, treated groundwater, or ambient air for treatment of contaminated soil or groundwater may inject only additives determined by Department of Health and Human services not to adversely affect human health.	Injection of fluids into or air into an underground well for the purposes of groundwater remediation-- **applicable**	15A NCAC 02C .0225(a)

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Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	Rule requirements for other wells shall be treated as one of the injection well types in Rule .0209(5)(b) that most closely resembles the well equivalent hydrogeologic complexity and potential to adversely affect groundwater quality. The Director may permit by rule the emplacement or discharge of a fluid or solid into the subsurface for any activity that meets the definition of an "injection well" that the Director determines not to have the potential to adversely affect groundwater quality and does not fall under other rules in this Section.	Injection of substances into an underground well other than liquids or air—**relevant and appropriate**	15A NCAC 02C.0230
Reinjection of treated contaminated groundwater	Wells are not prohibited if injection is approved by EPA or a State pursuant to provisions for cleanup of releases under CERCLA or RCRA as provided in the CERCLA document.	Class IV wells [as defined in 40 CFR § 144.6(d)] used to re-inject treated contaminated groundwater into the same formation from which it was drawn – **relevant and appropriate**	40 CFR § 144.13(c) RCRA § 3020(b)
Injection zone determination	Shall specify the horizontal and vertical portion of the injection zone within which the proposed injection activity shall occur based on the hydraulic properties of that portion of the injection zone specified. No violation of groundwater quality standards specified in Subchapter 02L resulting from the injection shall occur outside the specified portion of the injection zone as detected by a monitoring plan approved by the Division.	Installation of groundwater remediation wells (other than permitted by Rule) for injection of additives--**applicable**	15A NCAC 02C.0225(e)(2)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
Mechanical integrity of wells	All permanent injection wells require tests for mechanical integrity, which shall be conducted in accordance with Rule .0207 of this Section. An injection well has internal mechanical integrity when there is no leak in the casing, tubing, or packer. An injection well has external mechanical integrity when there is no fluid movement into groundwaters through vertical channels adjacent to the injection well bore.	Installation of groundwater remediation wells (other than permitted by Rule) for injection of additives--**applicable**	15A NCAC 02C.0225(h); 15A NCAC 0207(a) and (b)
Operating an injection well(s) for in-situ treatment of groundwater	Pressure at the well head shall be limited to a maximum which will ensure the pressure in the injection zone does not initiate new fractures or propagate existing fractures in the injection zone, initiate fractures in the confining zone, or cause the migration of injected or formation fluids outside the injection zone or area.	**applicable**	15A NCAC 02C.0225(i)(1)
	Injection between the outermost casing and the well borehole is prohibited.	**applicable**	15A NCAC 02C.0225(i)(2)
Operation and maintenance of treatment system	Shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used. Proper operation and maintenance includes effective performance and adequate laboratory and process controls, including appropriate quality assurance procedures.	Operation of a well for injection of additives or groundwater underground – **applicable**	15A NCAC 02C .0211(k)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
Monitoring of injection wells	Monitoring wells shall be of sufficient quantity and location so as to detect any movement of injection fluids, injection process byproducts or formation fluids outside the injection zone as determined by the applicant in accordance with Subparagraph (e)(2) of this Rule. The monitoring schedule shall be consistent with the proposed injection schedule, pace of the anticipated reactions, and rate of transport of the injectants and contaminants. NOTE: The Monitoring will be specified in a monitoring plan included as part of a CERCLA document (e.g., Remedial Design or Remedial Action Work Plan).	Installation of groundwater remediation wells (other than permitted by Rule) for injection of additives--**applicable**	15A NCAC 02C.0225(e)(9)
	If affected, may require additional monitor wells located to detect any movement of injection fluids, injection process byproducts, or formation fluids outside the injection zone as determined by the applicant in accordance with Subparagraph (e)(2) of this Rule. If the operation is affected by subsidence or catastrophic collapse, the monitoring wells shall be located so that they will not be physically affected and shall be of an adequate number to detect movement of injected fluids, process byproducts, or formation fluids outside the injection zone or area.	Installation of monitoring wells in (or adjacent to) the injection zone that may be affected by injection operations – **applicable**	15A NCAC 02C.0225(j)(3)
Abandonment of Wells			
Abandonment of groundwater monitoring well(s) and injection wells	Shall be abandoned in accordance with the requirements of 15A NCAC 02C .0113(b)(1) and (2).	Permanent abandonment of water supply wells (including temporary wells)--**applicable**	15A NCAC 02C.0113(b)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	Shall be abandoned by completely filling with a bentonite or cement-type grout.	Permanent abandonment of wells (including temporary wells) other than for water supply--**applicable**	15A NCAC 02C.0113(d)(2)
	All wells shall be permanently abandoned in which the casing has not been installed or from which the casing has been removed, prior to removing drilling equipment from the site.	Permanent abandonment of wells (including temporary wells) other than for water supply--**applicable**	15A NCAC 02C.0113(f)
Control of Diffuse VOC Emissions from Groundwater Treatment			
Emissions of VOCs from groundwater treatment (e.g., sparging system)	Shall not emit any of the toxic air pollutants listed in the table of the Rule in such quantities that may cause or contribute beyond the premises (adjacent property boundary) to any significant ambient air concentration that may adversely affect human health.	Emissions of toxic air pollutants (e.g., VOCs) from facility into the ambient air--**applicable**	15A NCAC 02D.1104
	Shall install and operate reasonable available control technology to limit emissions of VOCs.	Air emissions of VOCs from facilities where there is no other applicable emissions control rule--**relevant and appropriate**	15A NCAC 02D.0951(c)
	One of the applicable test methods in Appendix M in 40 CFR part 51 or Appendix A in 40 CFR Part 60 shall be used to determine compliance with VOC emission standards.	VOC emission source not covered by 15A NCAC 02D.2613(b) through (e)--**relevant and appropriate**	15A NCAC 02D.2613(g)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
Emission limitations for process vents used in treatment of VOC contaminated groundwater	Shall meet the requirements under one of the options specified below: • Reduce from all affected process vents the total emissions of the HAP to a level less than 1.4 kilograms per hour (kg/hr) and 2.8 Mg/yr (3.0 pounds per hour (lb/hr) and 3.1 tpy); • Reduce from all affected process vents the emissions of total organic compounds (TOC) (minus methane and ethane) to a level below 1.4 kg/hr and 2.8 Mg/yr (3.0 lb/hr and 3.1 tpy); • Reduce from all affected process vents the total emissions of the HAP by 95 percent by weight or more; or • Reduce from all affected process vents the emissions of TOC (minus methane and ethane) by 95 percent by weight or more.	Process vents as defined in 40 CFR § 63.7957 used in site remediation of media (e.g., soil and groundwater) that could emit hazardous air pollutants (HAP) listed in Table 1 of Subpart GGGGG of Part 63 and vent stream flow exceeds the rate in 40 CFR § 63.7885(c)(1)--**relevant and appropriate**	40 CFR § 63.7890(b)(1) - (4) 15A NCAC 02D.1110
Standards for closed vent systems and control devices used in treatment of VOC contaminated groundwater	For each closed vent system and control device you use to comply with the requirements above, you must meet the operating limit requirements and work practice standards in Sec. 63.7925(d) through (j) that apply to the closed vent system and control device. NOTE: EPA approval to use alternate work practices under paragraph (j) in 40 CFR § 63.7925 will be obtained in a CERCLA document.	Closed vent system and control devices as defined in 40 CFR § 63.7957 that are used to comply with § 63.7890(b)--**relevant and appropriate**	40 CFR § 63.7890(c) 15A NCAC 02D.1110

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
Monitoring of closed vent systems and control devices used in treatment of VOC contaminated groundwater	Must monitor and inspect the closed vent system and control device according to the requirements in 40 CFR § 63.7927 that apply to the affected source. NOTE: Monitoring program will be developed as part of the CERCLA process and included in an appropriate CERCLA document.	Closed vent system and control devices as defined in 40 CFR § 63.7957 that are used to comply with § 63.7890(b)--**relevant and appropriate**	40 CFR § 63.7892 15A NCAC 02D.1110
Discharge of Wastewater from a Groundwater Treatment Unit			
Discharge into POTW--General prohibitions	A User may not introduce into a POTW any pollutant(s) which cause Pass Through or Interference. These general prohibitions and the specific prohibitions in paragraph (b) of this section apply to each User introducing pollutants into a POTW whether or not the User is subject to other National Pretreatment Standards or any national, State, or local Pretreatment Requirements.	Indirect discharge of pollutants into POTW from Industrial User as defined 40 CFR § 403.3--**applicable**	40 CFR § 403.5 (a)(1) National pretreatment standards: Prohibited discharges
Discharge into POTW--Specific prohibitions	In addition, the following pollutants shall not be introduced into a POTW: (1) Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR § 261.21;	**applicable**	40 CFR § 403.5 (b)(1) 15A NCAC 02H.0909
	(2) Pollutants which will cause corrosive structural damage to the POTW, but in no case Discharges with pH lower than 5.0, unless the works is specifically designed to accommodate such Discharges;	**applicable**	40 CFR § 403.5(b)(2) 15A NCAC 02H.0909
	(3) Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in Interference;	**applicable**	40 CFR § 403.5(b)(3) 15A NCAC 02H.0909

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	(4) Any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a Discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;	Indirect discharge of pollutants into POTW from Industrial User as defined 40 CFR § 403.3 - **applicable**	40 CFR § 403.5(b)(4) 15A NCAC 02H.0909
	(5) Heat in amounts which will inhibit biological activity in the POTW resulting in Interference, but in no case heat in such quantities that the temperature at the POTW Treatment Plant exceeds 40 °C (104 °F) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits;	**applicable**	40 CFR § 403.5(b)(5) 15A NCAC 02H.0909
	(6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;	**applicable**	40 CFR § 403.5(b)(6) 15A NCAC 02H.0909
	(7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;	**applicable**	40 CFR § 403.5(b)(7) 15A NCAC 02H.0909
	(8) Any trucked or hauled pollutants, except at discharge points designated by the POTW.	**applicable**	40 CFR § 403.5(b)(8) 15A NCAC 02H.0909
Discharge into POTW--Local prohibitions	Where specific prohibitions or limits on pollutants or pollutant parameters are developed by a POTW in accordance with 40 CFR § 403.5(c) , such limits shall be deemed Pretreatment Standards for the purposes of section 307(d) of the CWA.	Indirect discharge of pollutants into POTW from Industrial User as defined 40 CFR § 403.3-- **applicable**	40 CFR § 403.5(d) 15A NCAC 02H.0909
Waste Characterization and Storage			
Characterization of solid waste (e.g., well soil cuttings)	Must determine if solid waste is hazardous waste or if waste is excluded under 40 CFR § 261.4(b); and	Generation of solid waste as defined in 40 CFR § 261.2 and which is not excluded under 40 CFR § 261.4(a)--**applicable**	15A NCAC 13A.0107, only as it incorporates 40 CFR § 262.11(a)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	Must determine if waste is listed under 40 CFR Part 261; or	**applicable**	15A NCAC 13A.0107, only as it incorporates 40 CFR § 262.11(b)
	Must characterize waste by using prescribed testing methods or applying generator knowledge based on information regarding material or processes used.	**applicable**	15A NCAC 13A.0107, only as it incorporates 40 CFR § 262.11(c)
	Must refer to Parts 261, 262, 264, 265, 266, 268, and 273 of Chapter 40 for possible exclusions or restrictions pertaining to management of the specific waste.	Generation of solid waste which is determined to be hazardous--**applicable**	40 CFR § 262.11(d)
Storage of solid waste	All solid waste shall be stored in such a manner as to prevent the creation of a nuisance, insanitary conditions, or a potential B65public health hazard.	Generation of solid waste which is determined not to be hazardous--**relevant and appropriate**	15A NCAC 13B.0104(f)
	Containers for the storage of solid waste shall be maintained in such a manner as to prevent the creation of a nuisance or insanitary conditions. Containers that are broken or that otherwise fail to meet this Rule shall be replaced with acceptable containers.	**relevant and appropriate**	15A NCAC 13B.0104(e)
Characterization of hazardous waste	Must obtain a detailed chemical and physical analysis on a representative sample of the waste(s), which at a minimum contains all the information that must be known to treat, store, or dispose of the waste in accordance with pertinent sections of 40 CFR §§ 264 and 268.	Generation of RCRA-hazardous waste for storage, treatment or disposal--**applicable**	40 CFR § 264.13(a)(1)
	Must determine the underlying hazardous constituents [as defined in 40 CFR § 268.2(i)] in the waste.	Generation of RCRA characteristic hazardous waste (and is not D001 non-wastewaters treated by CMBST, RORGS, or POLYM of Section 268.42 Table 1) for storage, treatment or disposal--**applicable**	40 CFR § 268.9(a)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
	Must determine each EPA Hazardous Waste Number (Waste Code) to determine the applicable treatment standards under 40 CFR 268.40, et. seq.	**applicable**	40 CFR 268.9(a)
	Must determine if the waste is restricted from land disposal under 40 CFR § 268 et seq. by testing in accordance with prescribed methods or use of generator knowledge of waste.	**applicable**	40 CFR § 268.7
Temporary storage of hazardous waste in containers	A generator may accumulate hazardous waste at the facility provided that:	Accumulation of RCRA hazardous waste on site as defined in 40 CFR § 260.10--**applicable**	40 CFR § 262.34(a)
	•waste is placed in containers that comply with 40 CFR §§ 265.171 - 173; and	**applicable**	40 CFR § 262.34(a)(1)(i)
	•the date upon which accumulation begins is clearly marked and visible for inspection on each container	**applicable**	40 CFR § 262.34(a)(2)
	•container is marked with the words “hazardous waste”; or	**applicable**	40 CFR § 264.34(a)(3)
	•container may be marked with other words that identify the contents.	Accumulation of 55 gallons or less of RCRA hazardous waste at or near any point of generation--**applicable**	40 CFR § 262.34(c)(1)
Use and management of hazardous waste in containers	If container is not in good condition (e.g. severe rusting, structural defects) or if it begins to leak, must transfer waste into container in good condition.	Storage of RCRA hazardous waste in containers--**applicable**	40 CFR § 265.171
	Use container made or lined with materials compatible with waste to be stored so that the ability of the container is not impaired.	**applicable**	40 CFR § 265.172
	Keep containers closed during storage, except to add/remove waste.	**applicable**	40 CFR § 265.173(a)
	Open, handle and store containers in a manner that will not cause containers to rupture or leak.	**applicable**	40 CFR § 265.173(b)

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
Waste Treatment and Disposal			
Disposal of solid waste	Shall ensure that waste is disposed of at a site or facility whichis permitted to receive the waste.	Generation of solid waste intended for off-site disposal--**relevant and appropriate**	15A NCAC 13B.0106(b)
Disposal of RCRA hazardous waste in a land-based unit	May be land disposed if it meets the requirements in the table "Treatment Standards for Hazardous Waste" at 40 CFR § 268.40 before land disposal.	Land disposal, as defined in 40 CFR § 268.2, of restricted RCRA waste--**applicable**	40 CFR § 268.40(a)
	Must be treated according to the alternative treatment standards of 40 CFR § 268.49(c) or must be treated according to the UTSs [specified in 40 CFR § 268.48 Table UTS] applicable to the listed and/or characteristic waste contaminating the soil prior to land disposal.	**applicable**	40 CFR § 268.49(b)
Disposal of RCRA characteristic wastewaters in a POTW	Not prohibited if the wastes are treated for purposes of the pre-treatment requirements of section 307 of the CWA, unless the wastes are subject to a specified method of treatment other than DEACT in 40 CFR §268.40, or are D003 reactive cyanide.	**applicable**	40 CFR § 268.1(c)(4)(ii) 15A NCAC 13A.0112

TABLE 1
Action-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Action	Requirements	Prerequisite	Citation
Transportation of Wastes			
Transportation of hazardous waste on-site	The generator manifesting requirements of 40 CFR §§ 262.20 - 262.32(b) do not apply. Generator or transporter must comply with the requirements set forth in 40 CFR §§ 263.30 and 263.31 in the event of a discharge of hazardous waste on a private or public right-of-way.	Transportation of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-way-- **applicable**	40 CFR § 262.20(f)
Transportation of hazardous waste off-site	Must comply with the generator requirements of 40 CFR §§ 262.20 - 23 for manifesting, Section 262.30 for packaging, Section 262.31 for labeling, Section 262.32 for marking, Section 262.33 for placarding, Sections 262.40 and 262.41(a) for record keeping requirements, and Section 262.12 to obtain EPA ID number.	Off-site transportation of RCRA-hazardous waste--**applicable**	40 CFR § 262.10(h)
	Must comply with the requirements of 40 CFR §§ 263.11 - 263.31.	Transportation of hazardous waste within the United States requiring a manifest — **applicable**	40 CFR § 263.10(a)
Transportation of hazardous materials	Shall be subject to and must comply with all applicable provisions of the HMTA and DOT HMR at 49 CFR §§ 171 - 180.	Any person who, under contract with a department or agency of the federal government, transports “in commerce,” or causes to be transported or shipped, a hazardous material--**applicable**	49 CFR § 171.1(c)

TABLE 2
Location-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Location	Requirements	Prerequisite	Citation(s)
Presence of Wetlands	Shall take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance beneficial values of wetlands.	Federal actions that involve potential impacts to, or take place within, wetlands – **To Be Considered**	Executive Order 11990 Section 1.(a) *Protection of Wetlands*
	Shall avoid undertaking construction located in wetlands unless: (1) there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.		Executive Order 11990, Section 2.(a) *Protection of Wetlands*
Presence of Wetlands (as defined in 44 C.F.R. § 9.4)	The Agency shall minimize[1] the destruction, loss or degradation of wetlands.	Federal *actions affecting or affected by Wetlands* as defined in 44 C.F.R. § 9.4 – **relevant and appropriate**	44 C.F.R. § 9.11(b)(2) **Mitigation**
	The Agency shall preserve and enhance the natural and beneficial wetlands values.		44 C.F.R. § 9.11(b)(4) **Mitigation**
	The Agency shall minimize: • Potential adverse impact the action may have on wetland values.		44 C.F.R. § 9.11(c)(3) *Minimization provisions*
Presence of Floodplain(s) designated as such on a map[2]	Shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.	Federal actions that involve potential impacts to, or take place within, floodplain – **To Be Considered**	Executive Order 11988 Section 1. *Floodplain Management*

[1] *Minimize* means to reduce to smallest amount or degree possible. 44 C.F.R. § 9.4 Definitions.
[2] Under 44 CFR § 9.7 ***Determination of proposed action's location***, Paragraph (c) *Floodplain determination*. One should consult the FEMA Flood Insurance Rate Map (FIRM), the Flood Boundary Floodway Map (FBFM) and the Flood Insurance Study (FIS) to determine if the Agency proposed action is within the base floodplain.

TABLE 2
Location-Specific ARARs
CTS of Asheville Inc. Superfund Site
Asheville, North Carolina

Location	Requirements	Prerequisite	Citation(s)
	Shall consider alternatives to avoid, to the extent possible, adverse effects and incompatible development in the floodplain. Design or modify its action in order to minimize potential harm to or within the floodplain		Executive Order 11988 Section 2.(a)(2) *Floodplain Management*
	Where possible, an agency shall use natural systems, ecosystem processes, and nature-based approaches when developing alternatives for consideration.		Executive Order 13690 Section 2. (c)
Presence of Floodplain(s) designated as such on a map[1]	The Agency shall design or modify its actions so as to minimize[3] harm to or within the floodplain	Federal *actions affecting or affected by Floodplain* as defined in 44 C.F.R. § 9.4 – **relevant and appropriate**	44 C.F.R. § 9.11(b)(1) **Mitigation**
	The Agency shall restore and preserve natural and beneficial floodplain values.		44 C.F.R. § 9.11(b)(3) **Mitigation**
	The Agency shall minimize: • Potential harm to lives and the investment at risk from base flood, or in the case of critical actions[4], from the 500-year flood; • Potential adverse impacts that action may have on floodplain values		44 C.F.R. § 9.11(c)(1) and (3) *Minimization provisions*

[3] *Minimize* means to reduce to smallest amount or degree possible. 44 C.F.R. § 9.4 Definitions.
[4] See 44 C.F.R. § 9.4 Definitions, *Critical action*. Critical actions include, but are not limited to, those which create or extend the useful life of structures or facilities such as those that produce, use or store highly volatile, flammable, explosive, toxic or water-reactive materials.

APPENDIX A

Waste Management
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

LINDA CULPEPPER
Director

February 11, 2016

Mr. Craig Zeller
Superfund Branch, Waste Management Division
US EPA Region IV
61 Forsyth Street. SW
Atlanta, Georgia 30303

SUBJECT: Concurrence with Interim Action Record of Decision
CTS of Asheville, Inc.
Asheville, Buncombe County

Dear Mr. Zeller:

The State of North Carolina by and through its Department of Environmental Quality, Division of Waste Management (herein after referred to as "the state"), reviewed the Interim Action Record of Decision (ROD) received by the Division on February 8, 2016 for the CTS of Asheville, Inc. Superfund Site and concurs with the selected remedy, subject to the following conditions:

1. State concurrence on the ROD for this site is based solely on the information contained in the ROD received by the State on February 8, 2016. Should the State receive new or additional information which significantly affects the conclusions or amended remedy contained in the ROD, it may modify or withdraw this concurrence with written notice to EPA Region IV.

2. State concurrence on this ROD in no way binds the State to concur in future decisions or commits the State to participate, financially or otherwise, in the cleanup of the site. The State reserves the right to review, overview comment, and make independent assessment of all future work relating to this site.

3. If, after remediation is complete, the total residual risk level exceeds 10^{-6}, the State may require deed recordation/restriction to document the presence of residual contamination and possibly limit future use of the property as specified in NCGS 130A-310.8.

The State appreciates the opportunity to comment on the ROD and looks forward to working with EPA on the remedy for the subject site. If you have any questions or comments, please call Mr. Nile Testerman at (919) 707-8339.

Sincerely,

Jim Bateson, L G., Chief
Superfund Section
Division of Waste Management

cc: David Lown, NC Superfund

APPENDIX B

PUBLIC FORUM

PROPOSED PLAN FOR INTERIM REMEDIAL ACTION

T.C. ROBERSON HIGH SCHOOL AUDITORIUM
250 OVERLOOK ROAD
ASHEVILLE, NORTH CAROLINA 28803

TUESDAY, OCTOBER 13, 2015

6:08 P.M.

PANEL MEMBERS:

ANGELA MILLER, COMMUNITY INVOLVEMENT COORDINATOR
BRIAN TURNER, NAPL/TCE
JOHN AKER
JOE BELCHER, COUNTY COMMISSIONER
FRANKLIN HILL, DIVISION DIRECTOR
NESTER YOUNG

APPEARANCES:

CRAIG ZELLER, EPA REMEDIAL PROJECT MANAGER
US EPA Region 4
Superfund Division
11th Floor
61 Forsyth Street, Southwest
Atlanta, Georgia 30303

REPORTED BY: BARBIE M. LANE, CVR-M, CCR
ASHEVILLE REPORTING SERVICE

APPENDIX C

APPENDIX D

U.S. Environmental Protection Agency
Superfund Proposed Plan for Interim Remedial Action
CTS of Asheville, Inc. Superfund Site
Asheville, Buncombe County, North Carolina

October 2015

INTRODUCTION

The Region 4 office of the U.S. Environmental Protection Agency (EPA) is issuing this Proposed Plan about the Interim Remedial Action at the CTS of Asheville, Inc. Superfund Site (CTS site). This Proposed Plan presents the alternatives considered in the Focused Feasibility Study (FFS) to address the Non-Aqueous Phase Liquid (NAPL) and trichloroethene (TCE) underneath the former CTS plant. The FFS and Proposed Plan are available for review and the public is invited to comment on the documents during a 30 day public comment period.

SITE BACKGROUND

The CTS site is located at 235 Mills Gap Road in Asheville, NC 28803. International Resistance Company, (now Northrop Grumman Systems Corporation as the result of a series of mergers) owned and operated the site from 1952 to 1959, when CTS of Asheville, Inc. purchased the real property, building and equipment. Arden Electroplating, Inc. leased a portion of the building from December 1985 until December 1986, when it was sold to Mills Gap Road Associates (MGRA). The site has been vacant/unoccupied since the mid-1990s.

CTS manufactured electronic components used in auto parts and hearing aids from 1959 to April 1986 when plant operations ceased. Small electronic components were electroplated with tin, nickel, zinc and silver as one step in the process. Solvents, including TCE were used to clean, or degrease, the parts before

Community Involvement Opportunities

Public Comment Period

Dates: October 1, 2015 – October 30, 2015
Purpose: To solicit comments on the Proposed Plan for Interim Remedial Action

Public Meeting

Date: October 13, 2015
Time: 6:00 PM
Place: T.C. Roberson High School Auditorium located at 250 Overlook Road in Asheville
Purpose: To discuss details of the Proposed Plan for Interim Remedial Action

EPA Contacts

Direct your comments to:
Craig Zeller, EPA Remedial Project Manager via email zeller.craig@epa.gov or U.S. mail to: US EPA Region 4, Superfund Division – 11th Floor, 61 Forsyth Street, SW, Atlanta, GA 30303

Further questions, please contact:
Angela Miller, EPA Community Involvement Coordinator, miller.angela@epa.gov or (678) 575-8132.

electroplating. Disposal and/or recycling activities at the facility prior to 1959 are unknown. From 1959 to 1980, metal-bearing rinse waters and alkaline cleaners that could not be reclaimed from the electroplating process were reportedly disposed of through the municipal sewer system, while concentrated metals and solvent wastes were placed in drums for off-site disposal/recycling. After 1980, wastes were accumulated in drums on-site prior to off-site disposal/recycling.

Numerous environmental investigations have been conducted at the CTS site since the late 1980s. The Site was proposed to the National Priorities List (NPL) in March 2011, and became Final on the NPL in March 2012.

PREVIOUS CLEANUP ACTIONS

Three removal actions have been conducted at the Site under a 2004 Administrative Order on Consent between EPA, CTS and MGRA. From July 2006 to July 2010, a Soil Vapor Extraction (SVE) system operated at the site to remove volatile organic compounds (VOCs) from the subsurface, above the groundwater table. An estimated 6,473 pounds of VOCs were removed from the unsaturated zone over that four year period. The former building was demolished in December 2011.

From September 2012 to August 2014, CTS installed 101 water supply filtration systems in residences located within a one mile radius of the Site who relied on groundwater as their drinking water supply. The filtration systems were installed as a precautionary measure. In 2014 and 2015, municipal water supply lines were installed in the vicinity of the Site by Buncombe County. Eighty-seven residences with filtration systems elected to connect to the municipal water line. The remaining water filtration systems will continue to be maintained by CTS until they are no longer warranted.

In September 2014, a springs vapor removal system was installed by CTS on property immediately to the east of the Site, to reduce TCE concentrations in outdoor/indoor air. The remediation system includes a combination of air sparging and vapor extraction. Air sparging pumps air into the surface water and subsurface at seven locations. Vapors are extracted using a vacuum connected to extraction points at 12 locations and then treated by carbon in canisters. The area was covered with a low density polyethylene liner to increase the system's efficiency. Construction began on September 10, 2014 and the system has been in continuous operation since October 21, 2014. Monitoring indicates the system has been very effective at reducing TCE concentrations in the air and spring water. As of mid-April 2015, the vapor system removed approximately 42 lbs. of VOCs from the environment.

CTS also committed to conduct a site-wide Remedial Investigation/Feasibility Study under the terms of an Administrative Settlement Agreement and Order on Consent, which took effect on January 26, 2012. The FFS that lays the foundation for this Proposed Plan was developed by CTS according to that agreement.

SITE CHARACTERISTICS

The area surrounding the Site is rural and contains residential and light industrial properties. The Site is relatively flat and is situated on a "saddle" between Busbee Mountain to the north and Brown Mountain to the south-southwest. The geology under the site consists of fill material, residual soil (overburden) and bedrock. The depth to the groundwater table generally fluctuates from

15 to 49 feet below ground surface (bgs), depending on rainfall. The depth to bedrock ranges from 28 to 81 feet bgs.

Groundwater velocity is in the 10 to 100 feet per year range. Groundwater in the overburden generally flows two directions; towards the eastern springs remediation area, and to another springs area to the west of the Site. There is an approximate one acre plume of light NAPL that is weathered fuel oil. This one acre NAPL plume is mixed with high concentrations of TCE. There is a dissolved phase VOC (only) plume extending north of the NAPL area that moves east and west towards the springs discharge zones. Please see figure on page 7.

SCOPE AND ROLE OF THE INTERIM REMEDIAL ACTION

The scope of this Proposed Plan is an interim NAPL/TCE source control action that will be followed up later with a Final Site-wide cleanup decision. The area to be addressed with this interim action is the one acre source area illustrated on the attached figure. This source control action addresses approximately 40,500 cubic yards (CYs) of material in the saturated zone between the observed water table and top of bedrock.

At present, the treatment area of this Proposed Plan does not include the high levels of TCE (only) in groundwater north of the designated one acre source area, near monitoring well clusters MW6 and MW7. This area is also shown on the attached figure. Under this Proposed Plan, any residual NAPL/TCE mass in the subsurface that was not treated with this Interim Remedial Action, as well as TCE in the deep (bedrock) aquifer, will be addressed with a Final Site-wide cleanup decision.

However, the EPA is evaluating the feasibility of expanding the Interim Remedial Action treatment area to include the TCE mass in groundwater near MW6/MW7. Expanding the treatment area now would require more resources in the short-term, but would be more cost-effective long-term from a Final Site-wide cleanup perspective.

SUMMARY OF SITE RISKS

Groundwater at the Site is contaminated with chlorinated solvents, such as TCE, cis-1,2-dichloroethene (cis-DCE), and 1,1,1-trichloroethane (TCA). These chemicals are considered hazardous substances under Superfund. TCE was detected in groundwater at levels which exceed the EPA drinking water standard of 5 parts per billion. These contaminants pose a potential risk to human health and the environment, particularly through air inhalation and/or drinking water.

INTERIM REMEDIAL ACTION OBJECTIVES

The general Interim Remedial Action Objective (RAO) for this Proposed Plan is to significantly reduce the mass of NAPL and TCE that is the source of the dissolved-phase VOC groundwater plume. Over time, while the Final Site-wide cleanup plan is developed, the dissolved-phase VOC plume is expected to decrease in size and concentration. The specific RAO for this Proposed Plan is:

- Reduce the TCE concentrations in saturated soil, NAPL and groundwater by 95%.

Ninety-five percent reduction will be determined by pre-treatment and post-treatment verification sampling and analysis of saturated soil, NAPL and groundwater within the one acre source zone.

SUMMARY OF ALTERNATIVES

The FFS Report evaluated four proven remediation technologies to address the NAPL/TCE source area. As required by EPA guidance, a "No-Action" alternative was retained to serve as a baseline when comparing to the other alternatives. A description of the alternatives is summarized below.

Alternative 1: No Action

This "status quo" alternative assumes nothing would be done in the short term to address the NAPL/TCE source area. The No Action alternative defers all required cleanup work to the Final site-wide cleanup plan that is not expected for several years.

Alternative 2: Multi-Phase Extraction

Multi-phase extraction (MPE) removes NAPL, groundwater, and soil vapor from the subsurface using vacuum well(s). MPE would involve installation of extraction wells and a system to recover the NAPL. The extracted fluids and vapor would be treated in an aboveground treatment system on-site. After separation, the groundwater would be treated and disposed on-site, while the NAPL would be containerized and disposed off-site. It was assumed that the MPE system would have to operate for a 10 year period. The estimated cost to implement the MPE alternative is $2,670,000.

Alternative 3: Electrical Resistance Heating

Electrical resistance heating (ERH) involves heating the subsurface using electrodes installed in the zone of contamination. The electric current passed between the electrodes heats the saturated zone where there is sufficient moisture to conduct electricity. The heat "boils" the NAPL/TCE and vent wells are used to recover the vapors. The vapors are treated aboveground and discharged to the air. Any NAPL accumulation in the vent wells would be recovered and transported off-site for disposal. It was assumed that 19 months would be required to design, install and fully operate the ERH system to meet the RAO. The estimated cost to implement the ERH alternative is $4,150,000.

Alternative 4: In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) involves addition of chemicals into the zone of contamination via injection points. The chemicals oxidize the NAPL/TCE and break down the contaminants into harmless by-products like carbon dioxide and water. ISCO is typically implemented with a primary injection event and one or more polishing injections to reduce contaminant concentrations and mass to the desired level. Chemical oxidation using catalyzed hydrogen peroxide gives off heat, so vent wells would be required to recover vapor and any NAPL. ISCO would require installation of injection wells and an aboveground system to recover and treat vapors. It was assumed that ISCO would require three years to complete, including one primary injection event and two polishing steps. The estimated cost to implement the ISCO alternative is $3,820,000.

Alternative 5: Surfactant Flooding

Surfactant flooding involves injection of a substrate into the zone of contamination to increase the mobility of the NAPL phase. The NAPL and groundwater are then removed from the subsurface via extraction wells. After separation aboveground, the groundwater would be treated and discharged to the municipal sewer system, while the NAPL would be containerized and disposed off-site. Surfactant flooding would require installation of injection/extraction wells, and an aboveground treatment system. It was assumed that surfactant flooding would require two years to complete, including a primary flooding event and one follow-up step. The estimated cost to implement the surfactant flooding alternative is $3,520,000.

EVALUATION OF ALTERNATIVES

Remedy selection under Superfund requires that each alternative be evaluated by nine criteria. The first two criteria are known as Threshold Criteria. These two criteria must be met for a cleanup alternative to be selected:

1) ***Overall Protection of Human Health and the Environment:*** How the alternatives achieve protection and how risks are eliminated, reduced or controlled.
2) ***Compliance with Applicable, or Relevant and Appropriate Requirements (ARARs):*** Comply with other Federal and State environmental laws or regulations that apply to the cleanup action.

The next five criteria are referred to as Balancing Criteria. This set of criteria serves as the primary basis upon which each alternative is compared and analyzed to understand the trade-offs and distinct advantages/disadvantages.

3) ***Long-Term Effectiveness and Permanence:*** Ability of each alternative to meet the RAOs and stay protective over the long-term.
4) ***Reduction of Toxicity, Mobility and Volume (TMV):*** Addresses Superfund's preference for treatment as a principal element of the site cleanup.
5) ***Short-Term Effectiveness:*** Management of remedy construction activities to ensure adequate protection of on-site workers, adjacent communities and the environment.
6) ***Implementability:*** The availability of services, access to property, construction equipment and other administrative/ technical factors associated with the cleanup.
7) ***Cost:*** The Net Present Value of the alternative, including operation/maintenance activities, over the assumed lifetime of the cleanup project.

The final two criteria are called Modifying Criteria.

8) ***State Acceptance***
9) ***Community Acceptance***

EPA will issue a final cleanup decision only after consulting with the State of North Carolina and after considering comments received from the community during the public comment period.

EPA's PREFERRED ALTERNATIVE

EPA has selected Alternative 3, Electrical Resistance Heating (ERH), as the preferred alternative to address the NAPL/TCE source area. ERH was the most aggressive and effective source control remedy evaluated in the FFS. ERH provides the highest level of certainty to meet the RAO, as the technology has demonstrated greater than 95% TCE removal efficiencies. ERH can be implemented in the least amount of time, and provides the greatest long-term permanence. Although ERH has a slightly higher total cost, it is a one-time source control and treatment event with no longer term operation and maintenance costs.

COMMUNITY PARTICIPATION

EPA encourages the public to provide comments on the Proposed Plan during the 30 day public comment period which begins on October 1st and extends through October 30, 2015. Documents supporting the Preferred Alternative can be found on line at http://semspub.epa.gov/src/collection/04/AR63944. Upon timely request, EPA will extend the comment period for an additional 30 days. Comments may be emailed to: Zeller.Craig@epa.gov. Hard copies may be sent via U.S. Mail, to Craig Zeller, US EPA Region 4, Superfund Division – 11th Floor, 61 Forsyth Street, SW, Atlanta, GA 30303.

PUBLIC MEETING

EPA will host a public meeting on Tuesday, October 13, 2015, at 6:00pm in the auditorium of the T.C. Roberson High School located at 250 Overlook Road in Asheville. Representatives from EPA will present the rationale behind the Proposed Plan for the NAPL/TCE Interim Remedial Action at the CTS of Asheville, Inc. Superfund site, and answer any questions the public may have regarding the interim proposed plan.

CONTACT INFORMATION

EPA

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ZELLER.CRAIG@EPA.GOV

Information Repository

EPA has established an information repository for the public to review some of the documents related to the Site and the Superfund program. The local repository does not include all documents related to the Site. Additional documents may be made available by EPA upon request. The local information repository is located at the:

Pack Memorial Library
67 Haywood Street
Asheville, North Carolina 28801-2834

EPA Website

EPA has a website specifically for the CTS of Asheville, Inc. Superfund Site. The website address is:
http://www.epa.gov/region4/superfund/sites/npl/northcarolina/millsgapnc.html

NCDEQ

Nile Testerman
919.707.8339
NILE.TESTERMAN@NCDENR.GOV

NCDHHS Website

The State Center for Health Statistics of the N.C. Department of Health and Human Services has completed an updated cancer study for the community within 1-mile radius of the CTS NPL site. The report will be available soon at http://epi.publichealth.nc.gov/oee/hace/by_site.html#cts .

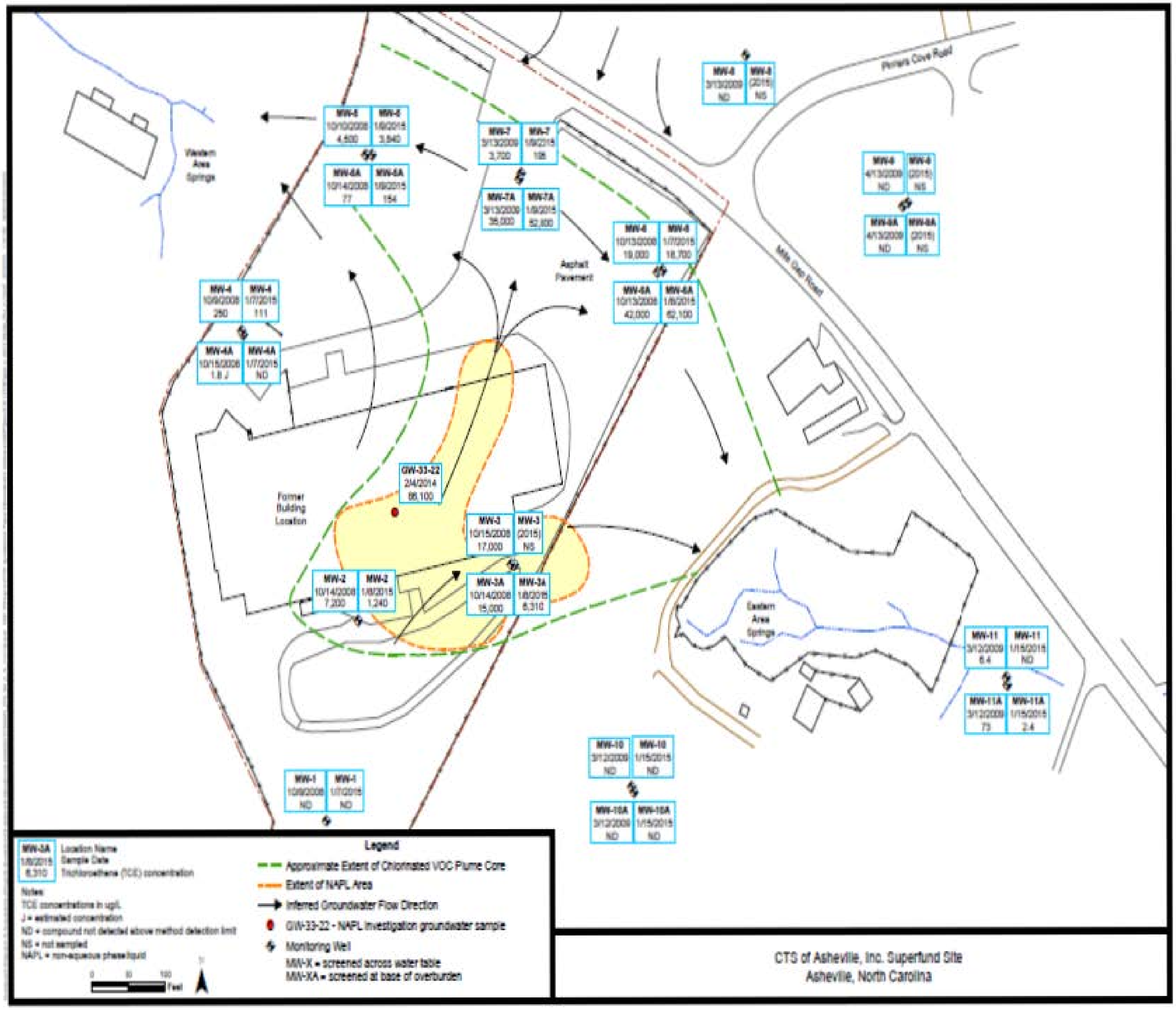
Websites created by community members

- Clean Asheville: http://cleanasheville.info
- POWER Action Group: http://poweractiongroup.org

Community Groups

Concerned Citizens for Mills Gap Cleanup
Glen Horecky
GEH4@MSN.COM

TAG Recipient:
POWER Action Group
Lee Ann Smith
UPTHISHILL@GMAIL.COM



Western Area Springs
Pinners Cove Road
Mills Gap Road
Asphalt Pavement
Former Building Location
Eastern Area Springs
MW-5 10/10/2008 4,600
MW-5 1/9/2015 3,840
MW-5A 10/14/2008 77
MW-5A 1/9/2015 154
MW-7 3/13/2009 3,700
MW-7 1/9/2015 106
MW-7A 3/13/2009 35,000
MW-7A 1/9/2015 52,600
MW-8 3/13/2009 ND
MW-8 (2015) NS
MW-9 4/13/2009 ND
MW-9 (2015) NS
MW-9A 4/13/2009 ND
MW-9A (2015) NS
MW-6 10/13/2008 19,000
MW-6 1/7/2015 18,700
MW-6A 10/13/2008 42,000
MW-6A 1/8/2015 62,100
MW-4 10/9/2008 250
MW-4 1/7/2015 111
MW-4A 10/15/2008 1.8 J
MW-4A 1/7/2015 ND
GW-33-22 2/4/2014 86,100
MW-3 10/15/2008 17,000
MW-3 (2015) NS
MW-3A 10/14/2008 15,000
MW-3A 1/8/2015 6,310
MW-2 10/14/2008 7,200
MW-2 1/8/2015 1,240
MW-11 3/12/2009 6.4
MW-11 1/15/2015 ND
MW-11A 3/12/2009 73
MW-11A 1/15/2015 2.4
MW-10 3/12/2009 ND
MW-10 1/15/2015 ND
MW-10A 3/12/2009 ND
MW-10A 1/15/2015 ND
MW-1 10/9/2008 ND
MW-1 1/7/2015 ND
MW-3A 1/8/2015 6,310
Location Name
Sample Date
Trichloroethene (TCE) concentration
Notes:
TCE concentrations in ug/L
J = estimated concentration
ND = compound not detected above method detection limit
NS = not sampled
NAPL = non-aqueous phase liquid
0 50 100 Feet
N
Legend
Approximate Extent of Chlorinated VOC Plume Core
Extent of NAPL Area
Inferred Groundwater Flow Direction
GW-33-22 - NAPL investigation groundwater sample
Monitoring Well
MW-X = screened across water table
MW-XA = screened at base of overburden
CTS of Asheville, Inc. Superfund Site
Asheville, North Carolina