FOURTH FIVE-YEAR REVIEW REPORT FOR CHEMTRONICS, INC. SUPERFUND SITE BUNCOMBE COUNTY, NORTH CAROLINA

SEPTEMBER 2017

Prepared by

U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

Franklin E. Hill, Director
Superfund Division

9/28/17
Date

Table of Contents

Appendices

Tables

Figures

LIST OF ABBREVIATIONS & ACRONYMS

1,2-DCA	1,2-Dichloroethane
AOC	Administrative Order on Consent
APA	Acid Pit Area
ARAR	Applicable or Relevant and Appropriate Requirement
B	Building
BV	Back Valley
BZ	3-Quinuclidinyl benzilate
cDCE	Cis-1,2-dichloroethene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Chemicals of Concern
CS	Ortho-chlorobenzylidene malononitrile
DA	Disposal Area
DCM	Dichloromethane
DPLUR	Declaration of Perpetual Land Use Restrictions
EISB	Enhanced In-Situ Bioremediation
EPA	United States Environmental Protection Agency
FV	Front Valley
FYR	Five-Year Review
IC	Institutional Control
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MSD	Municipal Sewerage District
NCAC	North Carolina Administrative Code
NC DENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCP	National Contingency Plan
NPL	National Priorities List
µg/L	Micrograms per Liter
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RDX	Research Department Explosives
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TBA	Tert-Butyl Alcohol
TCE	Trichloroethylene
UU/UE	Unlimited Use/Unrestricted Exposure
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency has prepared this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40) Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Chemtronics, Inc. Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one operable unit (OU), which is addressed in this FYR. The OU addresses contaminated soil and groundwater.

EPA remedial project manager (RPM) Jon Bornholm led the FYR. Participants included project manager Beth Hartzell from the North Carolina Department of Environmental Quality (NCDEQ), Stuart Ryman, Robert Cork and Jonathan Ivey from potentially responsible parties' (PRPs') contractor Anchor QEA of North Carolina PLLC (Anchor QEA), and Melissa Oakley and Jill Billus from EPA contractor Skeo. The review began on 10/24/2016.

Site Background

The 535-acre Superfund Site is located in a semi-rural area about eight miles east of Asheville, in the Town of Swannanoa in Buncombe County, North Carolina (Figure E-1). The Site is divided into two distinct geographical areas known as the Front Valley (FV) and Back Valley (BV) (Figure 1). A prominent ridge separates the FV and the BV. Different companies manufactured explosives, incapacitating agents and chemical intermediates at the Site between 1952 and 1994. During facility operations, manufacturing occurred primarily in the FV. Material testing and waste disposal occurred primarily in the BV. Manufacturing, testing and waste disposal occurred on about 200 acres of the 535-acre Site. This included 23 individual disposal areas which were grouped into six discrete waste disposal areas (DAs). These areas are designated as DA-10/11 and DA-23 (located in the FV) and DA-6, DA-7/8, DA-9 and the Acid Pit Area (APA) (located in the BV). Together, these DAs occupy less than 10 acres of the Site. Solid waste material and possibly solvents were reportedly incinerated in the APA. Chemical waste and spent acid were also disposed in trenches in the APA. Chemical wastes from the manufacturing of ortho-chlorobenzylidene malononitrile (CS) and agent 3-quinuclidinyl benzilate (BZ) were placed in metal 55-gallon drums and reportedly neutralized with a kill solution. These drums were buried in DA-6, DA-7/8, DA-9, and DA-10/11 along with other process wastes and solid wastes. DA-23 is a former wastewater treatment biolagoon associated with Building 113 (B113). This biolagoon was built on top of an abandoned leach field also associated with B113. The leach field was in use during the years CS and BZ were generated. B113 was the building where the majority of production/ manufacturing occurred.

The Site is not currently in use and the owner of the property, Chemtronics, Inc., has no current plans for reuse, other than potential, sustainable forestry practices. Most of the Site is heavily wooded. Current site features include concrete former building pads, ponds, fenced and capped disposal areas, remedial components, a security guard hut and a maintenance shed (Figures 1 and 2). The Site's 2016 Record of Decision (ROD) Amendment split the originally established site into the Chemtronics Superfund site and the Chemtronics property (Figures 1 and E-1). The Chemtronics Superfund site is located within the larger Chemtronics property. The Chemtronics property outside of the Chemtronics Superfund site is not considered part of the Superfund site. There are plans underway to establish a conservation easement on those portions of the Chemtronics property outside of the Chemtronics Superfund site in the future. Once established, the conservation easement area will be used for sustainable forestry and conservation practices. The site property is bordered to the north, northeast, and northwest by sparsely populated woodlands, primarily national forests or State game lands. Unincorporated residential neighborhoods are located immediately east, west, and south of the Site and include the Bee Tree Road community, Dillingham Circle, and the Old Bee Tree/Rainbow Ridge community, respectively. An industrial facility (the former RadioShack Swannanoa property), located immediately south of the Site, has recently been returned to active use and was being investigated/remediated under the North Carolina Registered Environmental Consultant Program.

Groundwater is not used for any purpose at the Site. The City of Asheville's public water supply system provides potable water for most of the area. However, some residences near the Site rely on private wells for water.

Surface water bodies on site include three ponds, Bee Tree Creek and two tributaries – Gregg Branch and Unnamed Branch (Figure 1). The Unnamed Branch drains the FV. Gregg Branch drains the BV. Both tributaries discharge to Bee Tree Creek. Groundwater at the Site is present in a three-part aquifer system consisting of the Surficial Aquifer, the Transition Zone Aquifer and the Bedrock Aquifer. Groundwater flows vertically from the Surficial Aquifer down to the deeper aquifers, and horizontally toward the southeast within all aquifers. Some groundwater discharges to Bee Tree Creek, Gregg Branch and Unnamed Branch. Soil at the Site is generally less than 3 feet deep and consists primarily of clay, silt and sand-sized particles. Saprolite underlies the soil and is of varying thickness and approaches 100 feet thick at several locations. The surface of the Site is moderately sloping to steep.

For reference, Appendix A includes a list of documents reviewed during this FYR. Appendix B includes current site status indicators. Appendix C includes a timeline of site events.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Chemtronics, Inc.		
EPA ID: NCD095459392		
Region: 4	**State:** North Carolina	**City/County:** Swannanoa/Buncombe
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	

REVIEW STATUS
Lead agency: EPA
Author name: Jon Bornholm (EPA) and Melissa Oakley (Skeo)
Author affiliation: EPA and Skeo
Review period: 10/24/2016 – 9/26/2017
Date of site inspection: 1/19/2017
Type of review: Statutory
Review number: 4
Triggering action date: 9/26/2012
Due date *(five years after triggering action date)*: 9/26/2017

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Rupture of a wastewater treatment lagoon liner in 1979 resulted in a release of wastewater at a disposal area (DA) later referred to as DA-23. In 1980, the State ordered Chemtronics, Inc. (Chemtronics) to stop discharging wastes to disposal trenches. The EPA added the Site to the Superfund program's National Priorities List (NPL) on September 8, 1983.

Under a 1985 Administrative Order on Consent (AOC), two PRPs – Chemtronics and Northrop Grumman – performed the Site's first remedial investigation and feasibility study (RI/FS) between 1985 and 1988. The RI focused on known waste disposal areas associated with past site operations, including the 23 individual disposal areas, which were grouped into six discrete waste DAs. The DAs included DA-10/11 and DA-23 in the FV and DA-6, DA-7/8, DA-9 and the APA in the BV. Together, the six DAs cover less than 10 acres of the Site. Soil contaminants identified during the RI included volatile organics such as 1,2-dichloroethane (1,2-DCA) and trichloroethylene (TCE). The human health risk assessment identified unacceptable risks associated with exposure to surface soil at DA-9. Groundwater contaminants identified by the 1988 RI included volatile organics, non-volatile organics and metals. The RI determined that concentrations of those groundwater constituents exceeded drinking water and/or groundwater quality criteria within the Surficial Aquifer and the Bedrock Aquifer.

Following a North Carolina Department of Environment and Natural Resources (NC DENR - now the NCDEQ) request in 2007 for the EPA to consolidate oversight of all site-related remediation efforts under its CERCLA authority (see the "Response Actions" section below for additional details), the EPA entered into an AOC in 2008 with the Site's three PRPs to conduct a new sitewide RI/FS. The PRPs – Chemtronics, Northrop Grumman Systems Corporation and CNA Holdings LLC – performed the sitewide RI/FS between 2009 and 2016. They completed the RI in 2015 and the FS in 2016.

Under current site conditions, the baseline risk assessment, performed as part of the 2015 RI, did not identify any current, unacceptable risks to human health associated with hazardous substances at the Site. Under potential future conditions, the RI identified unacceptable risks for on-site workers and on-

site residents. The future risk scenarios resulting in unacceptable risk included future industrial worker exposure to chemicals of concern (COCs) via direct contact with surface soil and vapors from subsurface soil, vapor intrusion, and potable/non-potable groundwater use; future maintenance worker/construction worker exposure to COCs via direct contact with groundwater; and future on-site resident exposure to COCs via direct contact with surface soil and vapors from subsurface soil, vapor intrusion, and potable use of groundwater.

Implementation of the soil remedy selected in the Site's 1988 ROD adequately addressed soil-related risks for the BV (see the "Response Actions" section below for information regarding the 1988 remedy). The 2015 RI identified two areas in the FV where soil remediation is necessary. Remaining soil contamination associated with a concrete sump previously located at the back (east) of Building 116 (B116) poses an unacceptable future risk due to vapor intrusion of volatile organic compounds (VOCs) (Table 1 and Figure 2). Remaining soil contamination associated with a former underground storage tank at Building 109-137 (B109-137) also poses an unacceptable future risk due to vapor intrusion of VOCs (Table 1 and Figure 2).

Table 1: Soil COCs Identified in the 2015 Sitewide RI

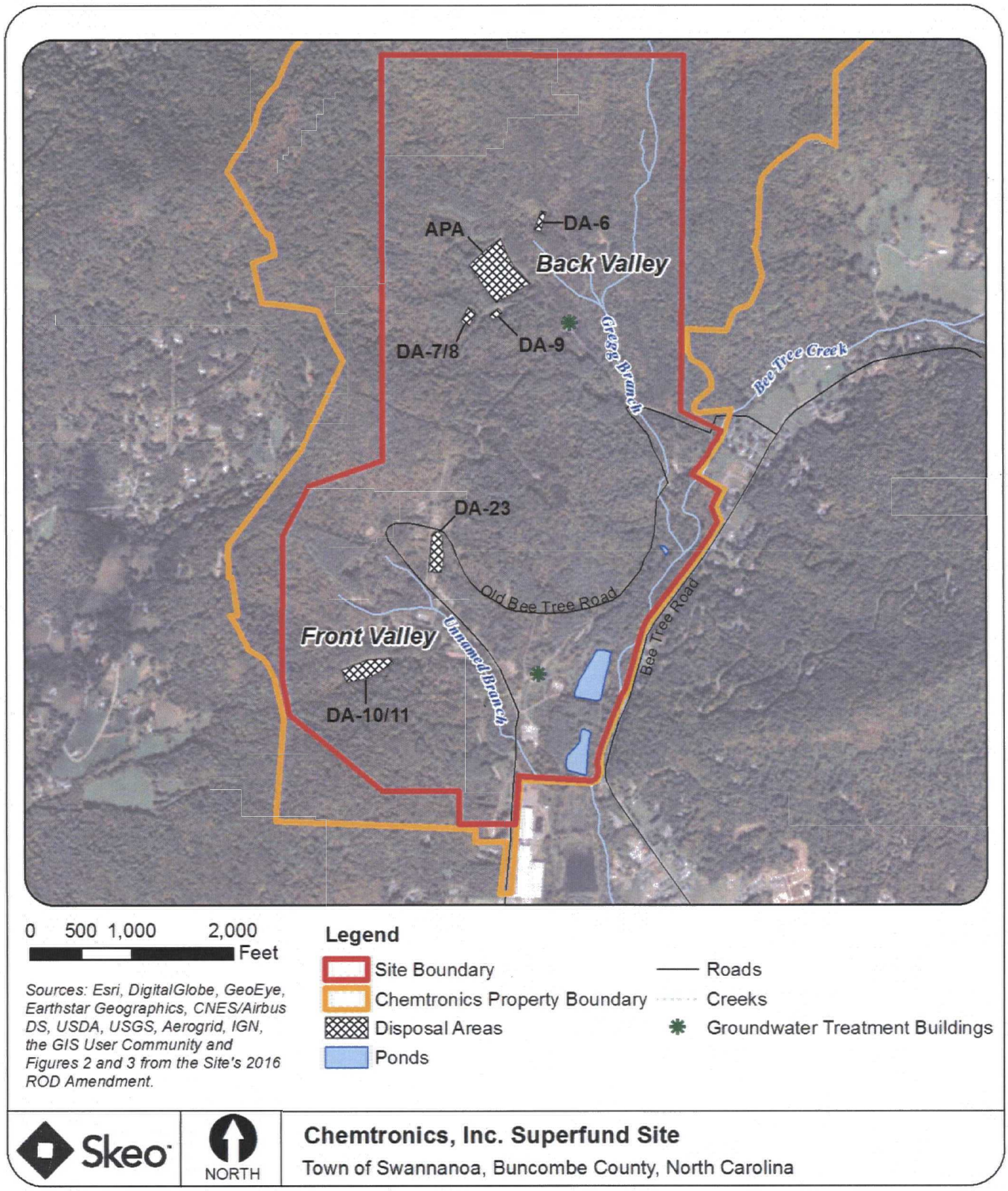
COC	Media
1,2-DCA, vinyl chloride, benzene, 1,1,2-trichloroethane, cyclohexane, methylene chloride	B116 Soil
1,2,4-trimethyl-benzene, 1,3,5-trimethyl-benzene	B109-137 Soil

The baseline risk assessment identified unacceptable future risk associated with site groundwater within all three site aquifers. The RI identified 11 areas that were considered in the FS. Following the FS, five FV locations and two BV locations were retained for remediation. Table 2 lists the groundwater areas of concern and the groundwater contaminants associated with each area. Figure 2 shows the site locations selected for remediation in the 2015 Sitewide RI.

Table 2: Groundwater Areas and COCs Identified in the 2015 Sitewide RI

Area Name	Groundwater COC	Aquifer
FV		
B104	Chloroform	Bedrock
B105 and B147	Perchlorate, RDX, TCE	Surficial and Transition Zone
B139	1,2-DCA, perchlorate, RDX, TCE, vinyl chloride	Bedrock
DA-23/B116	1,2-DCA, PCE, perchlorate, RDX, TCE	Surficial, Transition Zone and Bedrock
BV		
APA	1,2-DCA, PCE, perchlorate, RDX, tert-butyl alcohol (TBA), TCE	Surficial, Transition Zone and Bedrock
DA-9	1,2-DCA, perchlorate, RDX, TCE	Surficial, Transition Zone and Bedrock

Figure 1: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

The ecological risk assessment, performed as part of the 2015 RI, concluded that community-level risks for ecological receptors are not expected on a broad scale. However, potential risks to ecological receptors at some isolated locations at the Site could not be definitively ruled out. The ecological risk assessment states that specific monitoring requirements will be included in the sitewide remedy to ensure that site conditions do not pose unacceptable risks to ecological receptors (see the Response Actions section below for additional details).

Response Actions

In 1984, the U.S. Army's Toxic and Hazardous Materials Agency collected samples from two drums exposed at the surface of DA-10/11. The Agency suspected that the drums contained wastes from the production of chemical warfare BZ. While analysis showed no evidence of BZ in the drums, the EPA removed them in January 1985 in response to community concerns. The EPA disposed of the drums off site.

The EPA selected a remedy to address soil and groundwater contamination associated with the six DAs in a 1988 ROD. The 1988 ROD identified the following remedial action objectives (RAOs):

- Protect public health and the environment from exposure to contaminated on-site soils through inhalation, direct contact, and erosion of soils in surface waters and wetlands.
- Prevent off-site migration of groundwater contamination.
- Restore contaminated groundwater to levels protective of human health and the environment.

The selected remedy included the following components:

- Installation of multi-layer caps over DA-6, DA-7/8, DA-9, DA-10/11 and the APA.
- Establishment of vegetation over the caps and installation of a gas collection ventilation system, if necessary.
- Treatability studies for soil associated with DA-23 to determine the most appropriate soil fixation/stabilization/solidification process and mixing ratios, followed by capping.
- Installation of fencing and signs around capped areas.
- Groundwater extraction and treatment.
- Sampling of pond water and sediments, and if necessary, treatment using the groundwater treatment system or the selected soil treatment/containment process.
- Groundwater, surface water and sediment monitoring.

The EPA revised a component of the selected remedy in 1989 with a ROD Amendment. The revised remedy removed the requirement for fixation/stabilization/solidification of soil at DA-23 and selected installation of a multi-layer cap over the DA, with installation of a gas collection ventilation system if necessary.

The 1988 ROD and 1989 ROD Amendment focused on CERCLA-related wastes (the DAs) – they did not address the entire Site. In the 1980s, Chemtronics operated a manufacturing facility on site. The facility also operated as a permitted hazardous waste treatment, storage and disposal facility in accordance with Resource Conservation and Recovery Act (RCRA) regulations. Historically, there have been concurrent CERCLA and RCRA assessment and remediation projects at the Site. In 1997, Chemtronics entered into an AOC and Hazardous Solid Waste Amendments corrective action with the State of North Carolina. Site investigations identified multiple groundwater plumes associated with RCRA waste management units. Some of the plumes were co-mingled with the groundwater monitored as part of the CERCLA remedy (see the Status of Implementation section below for information regarding remedy implementation).

In March 2007, the NC DENR Hazardous Waste Section requested that the EPA consolidate oversight of all site environmental remediation activities under its CERCLA authority. In October 2008, the EPA agreed to the request and signed an AOC with the PRPs for the performance of the Site's new sitewide RI/FS.

Following the completion of the sitewide RI/FS in 2016, the EPA selected a remedy to address remaining sitewide contamination in the Site's September 2016 ROD Amendment.

The 2016 ROD Amendment identified the following RAOs for soil:

- Prevent dermal contact and inhalation by human receptors of carcinogenic and non-carcinogenic contaminants from subsurface soil at concentrations that pose an unacceptable risk.
- Prevent COC migration from impacted soil to groundwater that may result in concentrations above levels that are protective for drinking water use.

The 2016 ROD Amendment identified the following RAOs for groundwater:

- Restore impacted groundwater to levels acceptable for future beneficial use as a drinking water resource.
- Prevent exposure to groundwater with COC concentrations above levels that are protective for drinking water use.
- Prevent migration of contaminated groundwater to on-site surface water and sediments at concentrations that pose an unacceptable human health or ecological risk.
- Prevent migration of contaminated groundwater to off-site surface water and sediments at concentrations that pose an unacceptable human health or ecological risk.

The selected remedy included the following components:

- Excavation and off-site disposal at an EPA-approved landfill of contaminated soil at the following FV areas: B109-137 and B116.
- Enhanced in-situ bioremediation (EISB) with long-term groundwater monitoring and monitored natural attenuation (MNA) for contaminated groundwater for the following areas in the FV: B104, B105, B139, B147, and DA 23/B116.
- EISB with long-term groundwater monitoring and MNA for contaminated groundwater in the following areas in the BV: downgradient of DA-9 and the APA.
- Placement of institutional controls on the Superfund site portion of the Chemtronics property using the State of North Carolina Declaration of Perpetual Land Use Restrictions (DPLURs). These institutional controls will limit land uses at the Site to commercial/industrial purposes, restrict groundwater use, and prevent use of on-site groundwater for potable purposes. The DPLUR process requires the generation of a plat map that defines the Site's boundaries. NCDEQ or its successor will enforce the DPLURs.
- Maintenance of the caps and engineering controls for the six DAs required by the 1988 ROD and its associated documents.
- Performance monitoring and evaluation as outlined in the 2011 Proposed Assessment Monitoring Plan and the 2016 FS Report, which is to be finalized as part of a Performance Monitoring Plan in the Site's Remedial Design Report.
- Elimination of the requirement for pumping and treating groundwater in both valleys as specified in the 1988 ROD, abandonment of unnecessary structures associated with these pump-and-treat systems, and elimination of the trigger described in Section 6.5 – "Future Actions" – in the 1988 ROD.
- Continued evaluation of the remedy consistent with the FYR process.

The 2016 ROD Amendment based soil cleanup levels on the protection of future construction/industrial workers from direct contact and vapor inhalation. The EPA established risk-based soil cleanup levels under the assumption that the Site will remain in commercial/industrial use. The 2016 ROD Amendment based groundwater cleanup levels on North Carolina 2L standards. In cases where 2L standards are not available, cleanup levels were based on health-based limits calculated during the Site's baseline human health risk assessment. COCs and cleanup levels listed in the 2016 ROD Amendment supersede COCs and cleanup levels established by the 1988 ROD. Tables D-1 and D-2 in Appendix D include soil and groundwater COCs and cleanup levels, as established by the 2016 ROD Amendment.

The Site's ecological risk assessment states that specific monitoring requirements will be included in the sitewide remedy to ensure that site conditions do not pose unacceptable risks to ecological receptors. Section 7.2 of the 2016 ROD Amendment establishes the following monitoring requirements:

- Soil sampling for ortho-chlorobenzylidene malononitrile at one location in the on-site bear pit during the next FYR process;
- Surface water and sediment sampling for pesticides during the FYR process;
- Sampling of one surface water location downstream from the confluence of Bee Tree Creek for pesticides in the annual monitoring program; and
- Continued surface water sampling for VOCs, particularly TCE, as part of the annual monitoring programs.

Status of Implementation

Site PRPs implemented the remedy selected in the 1988 ROD and 1989 ROD Amendment between December 1991 and January 1993. Cleanup included capping and fencing all DAs and the installation and operation of two groundwater extraction and treatment systems – one in the FV and one in the BV. The FV extraction system included two extraction wells downgradient of DA-23; the treatment system included an equalization tank, air stripping and activated carbon filtration. The BV extraction system included 12 extraction wells downgradient of DA-9 and the APA; the treatment system included an equalization/setting tank, air stripping and pH adjustment. Remedy construction also included the installation of a passive gas venting system within the APA's cap. The vents have been sampled twice to determine if the disposal area beneath the cap emits gases. Gases have never been detected. The vents are no longer monitored.

Between 2004 and 2006, outside of the scope of CERCLA, the PRPs demolished all buildings and structures on site down to the building slab, except for those associated with environmental assessment and remediation efforts. The demolition included the collection and off-site disposal and/or recycling of building debris, scrap metal, asbestos-containing wastes and various hazardous and non-hazardous wastes.

Data collected during the 2015 RI confirmed the presence of groundwater plumes in the FV, including downgradient of the influence of the FV groundwater extraction system. The 2016 ROD Amendment identified that the existing FV pump and treat system had limitations and is approaching the end of its functional lifespan. This issue was also identified during the Site's 2012 FYR. In 2014, the EPA approved the shutdown of the Site's two extraction and treatment systems to allow for collection of groundwater and surface water data under non-pumping conditions for the purpose of evaluating various remedial alternatives. The systems remain off. According to the Site's September 2014 Monthly Status Report, the two treatment systems had treated 100.8 million gallons of groundwater as of September 2014.

EISB pilot-scale treatability studies are currently underway across the Site. The sitewide remedy selected by the 2016 ROD Amendment requires implementation of institutional controls for the Chemtronics Superfund site part of the larger Chemtronics parcel (parcel number 9780045253) to, at a minimum, limit land uses to commercial/industrial uses, restrict groundwater use and prevent the use of on-site groundwater for potable purposes. The DPLUR process also requires the generation of a plat map to identify the boundaries of the Superfund site. The institutional controls required by the 2016 ROD Amendment do not specifically prohibit digging at the DAs established by the 1988 ROD to prevent disturbance of the caps or unacceptable exposure to contaminated subsurface soil. However, access to the DAs is restricted by fencing and neither the property owner nor the PRP contractor perform any activities on the DA caps that could potentially impact the integrity of the caps or result in direct exposure to contaminated subsurface soil. The PRPs have submitted draft institutional control language to NCDEQ for review and approval. Following approval, the PRPs will file and record the final institutional controls with Buncombe County. Restrictions to prohibit material disturbance, excavation or removal of material at the DAs should be considered in the final institutional controls.

In 2014, the PRPs voluntarily paid to upgrade the public water supply line serving Old Bee Tree Road (south of the Site) so that it could accommodate additional connections. The PRPs also paid to connect four downgradient residents to the new water line (one connection along Old Bee Tree Road in 2014 and three connections to residents along Lauren Ridge Way in 2016). While not required by the Site's 2016 remedy, the PRPs also paid to prepare and record restrictive covenants for 11 off-site addresses (14 property parcels) located south of the Site between 2014 and 2016 (Table 4). The restrictive covenants prevent the use or extraction of groundwater from the subject properties, and required the closure of any existing wells. The PRPs paid to decommission three wells that had been used for potable water supply. The restrictive covenants listed in Table 4 have been filed and recorded with the Buncombe County Register of Deeds. The purpose of the water line extension and hookups and restrictive covenants is to eliminate the possibility of private off-site wells potentially impacting the location of site-related groundwater contamination. These voluntary actions by the PRPs aim to further eliminate the potential for future off-site exposure to groundwater contamination.

Table 3 below summarizes planned and implemented institutional controls for the Site. Table 4 below summarizes implemented institutional controls for off-site properties. Appendix J includes an example of a Restrictive Covenant filed for one of the off-site downgradient properties.

Systems Operations/Operation & Maintenance

Per the EPA's approval, PRP contractor Anchor QEA (operating as Altamont Environmental Inc. until January 2017) shut down the FV and BV groundwater extraction and treatment systems on September 25, 2014. Anchor QEA currently performs groundwater and surface water monitoring at the Site in accordance with the Site's 1997 Operations and Maintenance (O&M) Plan, the 2008 AOC, the 2011 Proposed Assessment Monitoring Plan and the November 2014 Revised Work Plan for Temporary Shutdown of the Front and Back Valley Extraction Wells and Treatment Systems. Since the shutdown of the systems, Anchor QEA has monitored groundwater and surface water semi-annually. Monitoring also includes quarterly surface water sampling, active sampling of EISB pilot test study areas and annual monitoring of an additional 18 (CERCLA) wells. Anchor QEA currently operates the FV groundwater treatment system in a limited capacity, primarily to treat purge water generated during sampling activities or extracted groundwater generated during pilot test studies. Currently, some injection and extraction wells are operated as part of pilot tests for areas identified in the 2016 ROD Amendment as needing active remediation.

In September 2015, the Metropolitan Sewerage District (MSD) of Buncombe County reduced the required monitoring frequency for each discharge pipe to once a year. Anchor QEA currently submits annual sampling results for discharge pipes 01 and 03 (in separate reports), and two monthly reports (titled Monthly MSD Sewer Discharge Billing Report and Monthly MSD Sewer Discharge Compliance Report), to the MSD. The reports verify that water discharged to the MSD meets site permit limits. Additional site O&M activities include mowing, inspection and general maintenance of capped areas, and maintenance of wells, fencing, signs and roads. Anchor QEA submitted monthly O&M status reports to the EPA in 2012, 2013 and 2014, and began submitting quarterly O&M reports to the EPA starting in 2015. No significant O&M issues have been noted since the previous FYR. Anchor QEA contracts a licensed surveyor to perform cap settlement surveys every five years. The last survey was performed in 2017. No evidence of excessive settlement was observed. The next settlement survey is scheduled to take place in 2022.

Table 3: Summary of Institutional Controls (ICs) to be Considered

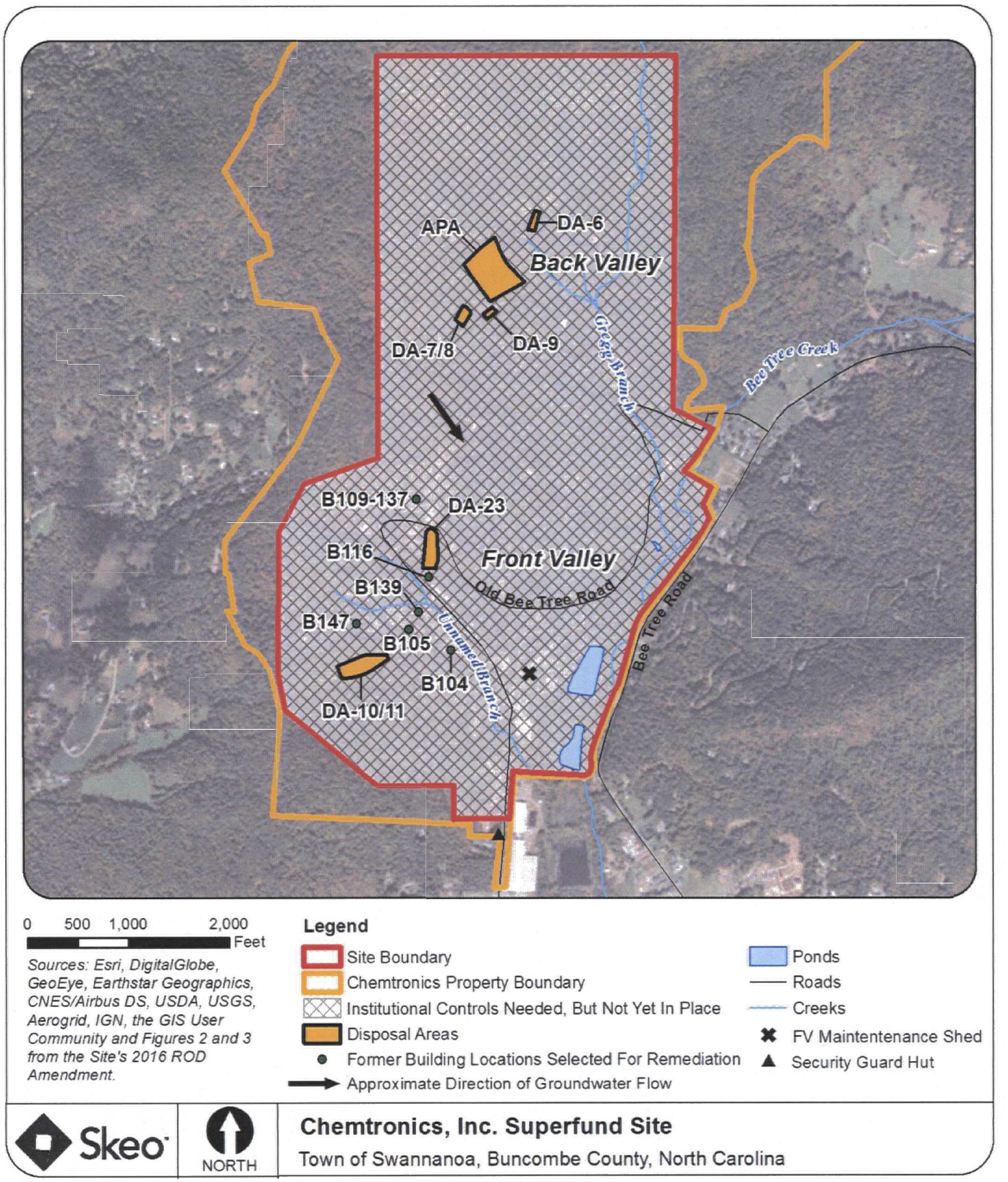
Media, Engineered Controls and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Affected Area	IC Objective	Title of IC Instrument Implemented or Planned
Soil	Yes	Yes	Superfund Site	At a minimum, restrict land use to commercial/industrial use, and, through the creation of a plat map, identify the boundaries of the Superfund site.	Draft institutional control language has been submitted to NCDEQ for review and approval.
Soil	Yes	Yes[a]	DAs located within the Superfund Site	Prohibit digging at the DAs established by the 1988 ROD to prevent disturbance of the caps and unacceptable exposure to contaminated subsurface soil.	None. Restrictions to prohibit material disturbance, excavation, or removal of material at the DAs established by the 1988 ROD should be considered in the final institutional controls.
On-Site Groundwater	Yes	Yes	Superfund Site	Prohibit the use of groundwater for potable purposes.	Draft institutional control language has been submitted to NCDEQ for review and approval.

Notes:
The 2016 ROD Amendment requires institutional controls for only the Chemtronics Superfund site part of property parcel.
[a] The 2016 ROD Amendment does not specifically require institutional controls to prohibit digging at the DAs; however, the language used in the decision document establishes the minimum institutional requirements (i.e. "at a minimum"), allowing for the requirement of additional institutional controls as needed.

Table 4: Declaration of Restrictive Covenants for Off-Site Properties					
Affected Media and Location	**ICs Needed**	**ICs Called for in the Decision Documents**	**IC Objective**	**Impacted Parcel(s)**	**Filing Date and Deed Book and Page Numbers (example: 5265/974)**
Off-Site Groundwater	No	No	Prevent the use or extraction of groundwater and require the closure of any existing wells.	9679961573	Filed 12/01/2014, 5265/974
				9679962708	Filed 12/1/2014, 5265/935
				9679961696	Filed 12/1/2014, 5265/947
				9679962661	Filed 12/1/2014, 5265/953
				9679972491	Filed 12/1/2014, 5265/941
				9679963934	Filed 12/1/2014, 5265/982
				9679972036	Filed 3/4/2014, 5189/1823
				9679972241	Filed 12/23/2014, 5272/222
				9679879763	Filed 12/1/2014, 5265/967
				9679973940	Filed 8/27/2015, 5347/1619
				9679873956	Filed 12/1/2014, 5265/959
				9679879368	Filed 11/8/2016, 5488/1832
				9679970429	Filed 11/7/2016, 5488/693
				9679970539	Filed 11/7/2016, 5488/702

Notes:
Parcel numbers above provided by Anchor QEA in March 2017.
All restrictive covenants listed above can be viewed online at the Buncombe County Register of Deeds website: http://registerofdeeds.buncombecounty.org/External/LandRecords/protected/v4/SrchBookPage.aspx.

Figure 2: Institutional Control Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Anchor QEA has established a pollinator habitat pilot project on site. The PRP contractor is experimenting with different pollinator plant species in test plots to determine if it would be possible to establish pollinator-supportive habitats as vegetative cover over the capped DAs.

As the groundwater component of the original 1988 remedy is no longer in place, it is not appropriate to compare the original estimates of O&M costs associated with the groundwater remedy to current annual O&M costs associated with groundwater monitoring. The 1989 ROD Amendment estimated annual O&M costs associated with cap maintenance of about $12,080.

Actual annual sitewide O&M costs for the current remedy from 2012 to 2016 are listed below in Table 5. The costs include those associated with routine O&M of the two pump and treat systems, compliance sampling, cap maintenance, and general Site maintenance. These costs do not include extensive pilot testing and other non-routine work associated with the development of the 2016 RI/FS.

Upon implementation of the new sitewide remedy, the 2016 ROD Amendment estimates annual O&M costs of about $510,900 associated with the FV groundwater remedial components, and estimated average annual O&M costs of about $365,000 associated with the BV groundwater remedial components. These estimates include the cost for all monitoring required by the Site's revised remedy. The 2016 ROD Amendment indicates that these estimates are for the initial remedy period and are expected to decrease over time as the extent of groundwater contamination decreases. The 2016 ROD Amendment does not include O&M cost estimates associated with the revised soil remedy (other than maintenance of the caps on the DAs), as the revised soil remedy for areas outside of the DAs will not require O&M. Following implementation of the new sitewide remedy, it is expected that new O&M requirements will be established in an updated O&M Plan.

Table 5: O&M Costs Over the FYR Period (2012-2016)

Year	Total Cost
2012	$424,000
2013	$315,000
2014	$312,000
2015	$197,000
2016	$164,000

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table 6: Protectiveness Determinations/Statements from the 2012 FYR		
OU #	**Protectiveness Determination**	**Protectiveness Statement**
Sitewide	Short-term Protective	The remedy at the Chemtronics Site protects human health and the environment in the short-term because the areas of soil contamination at the Site, where known waste disposal activity occurred, have been capped and fenced, which limits direct contact exposure, and there is no current exposure to contaminated groundwater. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: determine source of solids and develop procedure/process to eliminate/remove solids before effluent from groundwater treatment system is discharged; conduct a capture zone analysis for both groundwater extraction systems; re-evaluate the current groundwater remediation levels in light of current potential applicable or relevant and appropriate requirements (ARARs); evaluate the need for the "trigger" (i.e., contingency) in the 1988 ROD and if warranted, better describe/explain the contingency; place Perpetual Land Use Restrictions (Institutional Controls) on the property; and assess the potential for a vapor intrusion pathway.

Table 7: Status of Recommendations from the 2012 FYR					
OU #	**Issue**	**Recommendations**	**Current Status**	**Current Implementation Status Description**	**Completion Date (if applicable)**
Sitewide	Accumulation of solids in the Back Valley discharge line and in the Municipal Sewerage District (MSD) sewer downstream of the metering manhole.	Determine source of solids and develop procedure/process to eliminate/remove solids before effluent is discharged into discharge line.	Completed	The BV groundwater extraction and treatment system is no longer in operation. The remedy selected in the 2016 ROD Amendment eliminated the requirement for pumping and treating groundwater in both valleys as specified in the 1988 ROD, and required abandonment of unnecessary structures associated with the pump-and-treat systems.	9/29/2016
Sitewide	Adequacy of groundwater extraction systems.	Conduct a capture zone analysis for each groundwater extraction system and make recommendations along with a time-frame to address any identified data gaps.	Completed	In September 2014, the FV and BV groundwater treatment systems were taken out of operation to allow for the evaluation of the ongoing pilot scale treatability studies under natural hydraulic conditions. The remedy selected in the 2016 ROD Amendment eliminated the requirement for pumping and treating groundwater in both valleys. Once implemented, the revised groundwater remedy is expected to address remaining groundwater contamination at the Site.	9/29/2016
Sitewide	Adequacy of identified chemical-specific ARARs.	Re-evaluate the current groundwater remediation levels in light of current potential ARARs.	Completed	The 2016 ROD Amendment established chemical-specific groundwater ARARs based on current (September 2016) standards. These standards include the National Primary Drinking Water Standards (Maximum Contaminant Levels, or MCLs) and North Carolina 2L standards.	9/29/2016

Table 7: Status of Recommendations from the 2012 FYR					
OU #	**Issue**	**Recommendations**	**Current Status**	**Current Implementation Status Description**	**Completion Date (if applicable)**
Sitewide	Confusion about "Trigger" (i.e., contingency) language in 1988 ROD.	Evaluate the need for the "trigger" (i.e., contingency) as specified in the 1988 ROD. If deemed necessary to be incorporated into the forthcoming sitewide ROD, the contingency will be more thoroughly explained/described.	Completed	The 2016 ROD Amendment eliminated the groundwater remedy contingency "trigger" described in the 1988 ROD.	9/29/2016
Sitewide	Lack of Institutional Controls at the Site.	Place Perpetual Land Use Restrictions (Institutional Controls) on the Property in accordance to the requirements specified in the 2008 AOC.	Ongoing	The 2016 ROD Amendment required implementation of institutional controls to, at a minimum, limit land uses to commercial/industrial uses, restrict groundwater use and prevent the use of on-site groundwater for potable purposes. It also requires the creation of a plat map to identify the boundaries of the Superfund site. The PRPs have submitted draft institutional control language to NCDEQ for review and approval. Following approval, the PRPs will file and record the final institutional controls with Buncombe County. Restrictions to prohibit digging at the DAs should also be considered in the final institutional controls.	Not Applicable
Sitewide	Potential risks associated with soil vapor intrusion.	Assess the potential for a vapor intrusion pathway.	Completed	The baseline risk assessment, performed as part of the 2015 RI, evaluated risks associated with vapor intrusion from site soil. The soil component of the revised 2016 remedy addresses that exposure pathway. See the "Technical Assessment" section of this FYR Report for additional information.	9/29/2016

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available by newspaper posting in the *Asheville Times Newspaper*, on 7/11/2017. It stated that the FYR was underway and invited the public to submit any comments to EPA. A copy of the press notice is included in Appendix G. The results of the review and the report will be made available at the Site's information repository, Warren Wilson College Library, located at 701 Warren Wilson Road in Swannanoa.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. The results of these interviews are summarized below. Completed interview forms are included in Appendix I.

In general, the Site's EPA RPM has a positive impression of the Site. While the original groundwater extraction and treatment systems were marginally effective, the EPA expects that implementation of the sitewide remedy selected in the 2016 ROD Amendment will adequately address remaining contamination. The EPA addressed community questions that came up during the public comment period for the Proposed Plan in the Responsiveness Summary of the 2016 ROD Amendment. The EPA and the PRPs have also been active participants in the Swannanoa Superfund Community Advisory Group meetings by giving presentations and conducting question-and-answer sessions.

The Site's NCDEQ project manager also has a positive impression of the project, especially given the selection of the revised remedy in the new ROD Amendment. The NCDEQ has been involved with the Site throughout the development of the new RI/FS and ROD Amendment and is currently reviewing the draft institutional control language submitted by the PRPs. The NCDEQ project manager is not aware of any complaints or inquiries regarding the Site in the past five years, nor is she aware of any changes to state laws that might affect the protectiveness of the Site's remedy.

In general, the local residents interviewed have a positive impression of the current site status and feel well-informed regarding the Site. Interviewees indicated that EPA could best provide site-related information via email and web updates.

Data Review

The selection of the new remedy in the 2016 ROD Amendment and the associated establishment of new COCs and cleanup levels is expected to address any previously identified issues related to groundwater and surface water contamination at the Site. Therefore, this data review summarizes current site conditions based on information presented in the 2016 ROD Amendment and the monitoring reports routinely submitted by Anchor QEA. This data review confirms that there are no complete exposure pathways associated with surface water or groundwater at the Site. As discussed in the Basis for Taking Action section, under current site conditions there are no unacceptable risks to human health associated with site soil.

Groundwater

Site-related groundwater contamination is present within all three aquifers underlying the Site – the Surficial Aquifer, the Transition Zone Aquifer and the Bedrock Aquifer. Groundwater COCs consist primarily of VOCs, nitroaromatic compounds and perchlorate. Groundwater monitoring reports show isoconcentration contours for indicator COCs. Indicator COCs have been selected based on the frequency of constituent detections, the concentrations of constituents and the frequency of groundwater criteria exceedances. The indicator COCs selected to define the primary groundwater isoconcentration contours for the FV are TCE, tetrachloroethylene (PCE), chloroform, 1,2-DCA, research department explosives (RDX) and perchlorate. Indicator COCs selected to define the primary groundwater isoconcentration contours for the BV include TCE, tert-butyl alcohol (TBA), chloroform, 1,2-DCA, RDX and perchlorate.

According to the 2016 ROD Amendment and data included in the 2016 Annual Assessment Monitoring Report, groundwater data do not indicate off-site migration of site-related COCs at concentrations that exceed the groundwater cleanup levels established by the 2016 ROD Amendment (Table D-2). Figures in this section and Appendix K show COC plume locations for the Surficial Aquifer and the Transition Zone Aquifer, and COC concentrations within the Bedrock Aquifer as of October 2016. As shown on the plume maps, there are discrete plumes associated with the different indicator COCs throughout the different aquifers. The 2016 ROD Amendment used TCE isopleth maps as a good depiction of the extent of groundwater contamination in both valleys. Figures 3 through 6 on the following pages show

the extent of TCE in groundwater in the Surficial and Transition Zone Aquifers in both the FV and BV as of October 2016.

In general, groundwater data indicate that the most heavily contaminated site groundwater is present within the Surficial Aquifer in the BV, located primarily at and downgradient from the BV DAs. In general, COC concentrations within the FV tend to be lower than those observed in the BV. The extent of groundwater contamination within the Bedrock Aquifer covers a much smaller area than what is observed in the shallower, overlaying aquifers. While COCs within the Bedrock Aquifer exceed cleanup levels, in general, COC concentrations are much lower within the Bedrock Aquifer than in the shallower aquifers. Appendix K includes detailed information about concentrations and the extent of indicator COCs.

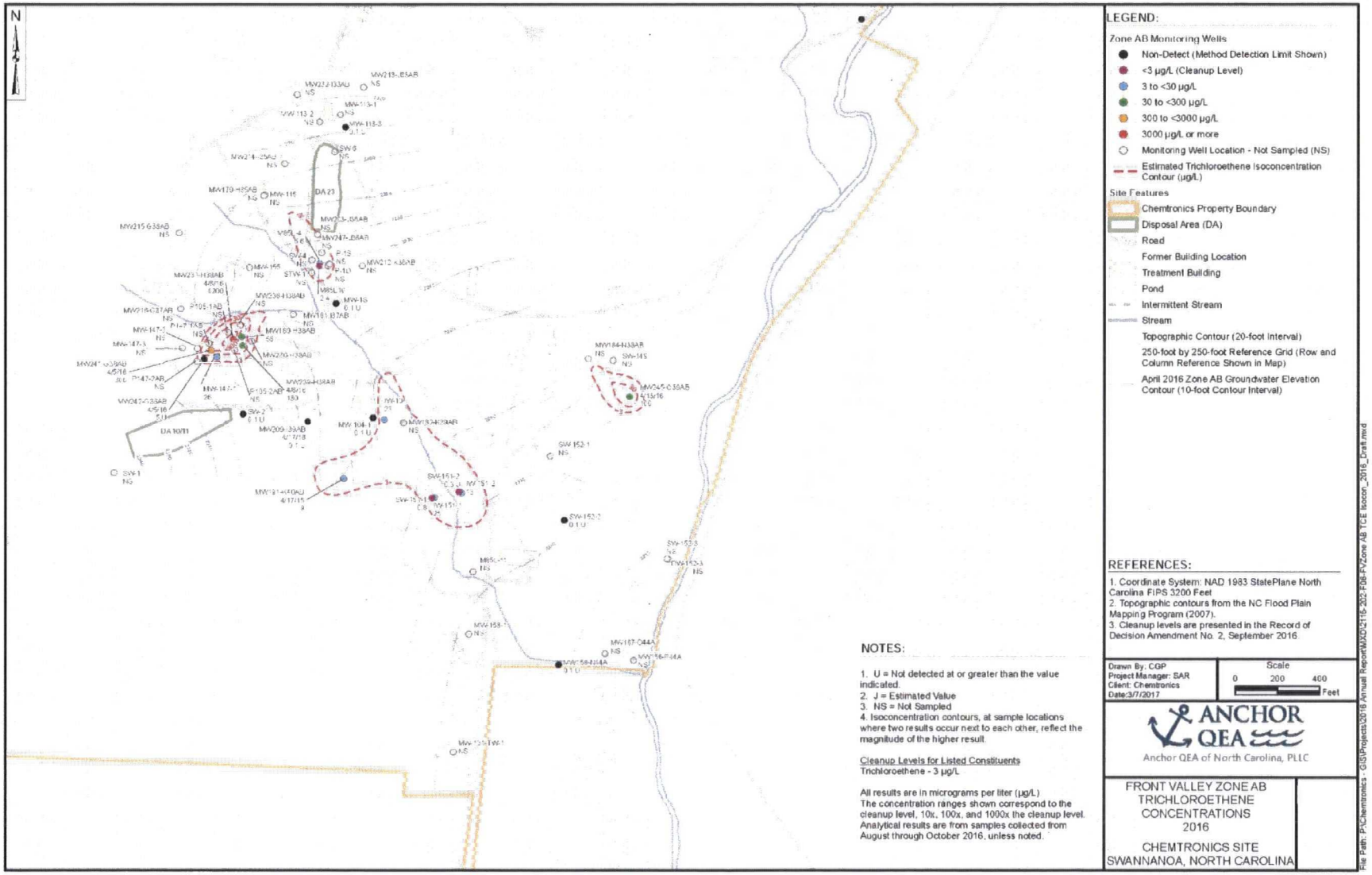
RDX within the Front Valley Transition Zone Aquifer extends in a long narrow pathway toward the Site's southeastern boundary to well MW154-O44C. In August 2015, RDX concentrations at that location exceeded the cleanup level of 0.3 micrograms per liter (µg/L) with a result of 0.5 µg/L. In September 2016, RDX was not detected at well MW154-O44C with a reported detection limit of 0.7 µg/L. However, that result does not confirm whether the COC was present at or slightly above the cleanup level of 0.3 µg/L (Figure 7). In spring 2017, MW154-O44C showed an estimated RDX concentration of 0.23 µg/L, which is below the cleanup level.[1] The most recent data show that RDX contamination appears to be confined within the site boundary. However, continued close monitoring of RDX concentrations at that location is warranted. RDX was not detected in spring 2017 at five wells located near well MW154-O44C (BW-13, MW158-N44A, MW167-O44A, MW156-P44A and MW155-P43C). The off-site property immediately south of well MW154-O44C, at 111 Old Bee Tree Road, is an industrial property. According to the City of Asheville's Water Resources Department, the property is connected to the public water supply.

In August 2015, TBA concentrations at BV Transition Zone Aquifer monitoring well MW172-T32D exceeded its cleanup level of 10 µg/L, with a result of 11 µg/L. In September 2016, at that same well, routine groundwater analysis detected a TBA concentration of 120 µg/L. Resampling efforts at the same well in October 2016 verified the elevated concentration observed in September 2016 (Figure 8). The groundwater sample collected from this well in the spring 2017 had a TBA concentration of 130 µg/L. The well is screened between 32 and 42 feet below ground surface and is located near the Site's eastern boundary at the BV (Figure 8). The well is located near the downgradient residential area. Response to the result included EPA notification, a mail-out survey to property owners within 1,500 feet to the east and south of the Site, sampling of eight off-site residential wells adjacent to the BV, and the addition of the well to an interim quarterly sampling schedule. The residential well sampling indicated that detected chemicals in these residential wells were below the North Carolina 2L groundwater standards. Anchor QEA sent letters to the owners of the eight private wells sampled, informing them of the results.

The off-site water well survey in 2010 and the above-mentioned off-site residential well sampling activities in 2016 have found no COCs attributable to the Site in off-site groundwater at concentrations that exceed the 2L standards.

[1] Spring 2017 sampling results for well MW154-O44C and the five surrounding wells were provided by Anchor QEA for inclusion in this FYR; they were not submitted as part of an Annual Assessment Monitoring Report.

Figure 3: Extent of TCE in FV Surficial Aquifer Wells in 2016[2]



[2] Figures 3 through 10 in this section are from the 2016 Annual Assessment Monitoring Report, Anchor QEA. March 31, 2017.

Figure 4: Extent of TCE in FV Transition Zone Aquifer Wells in 2016

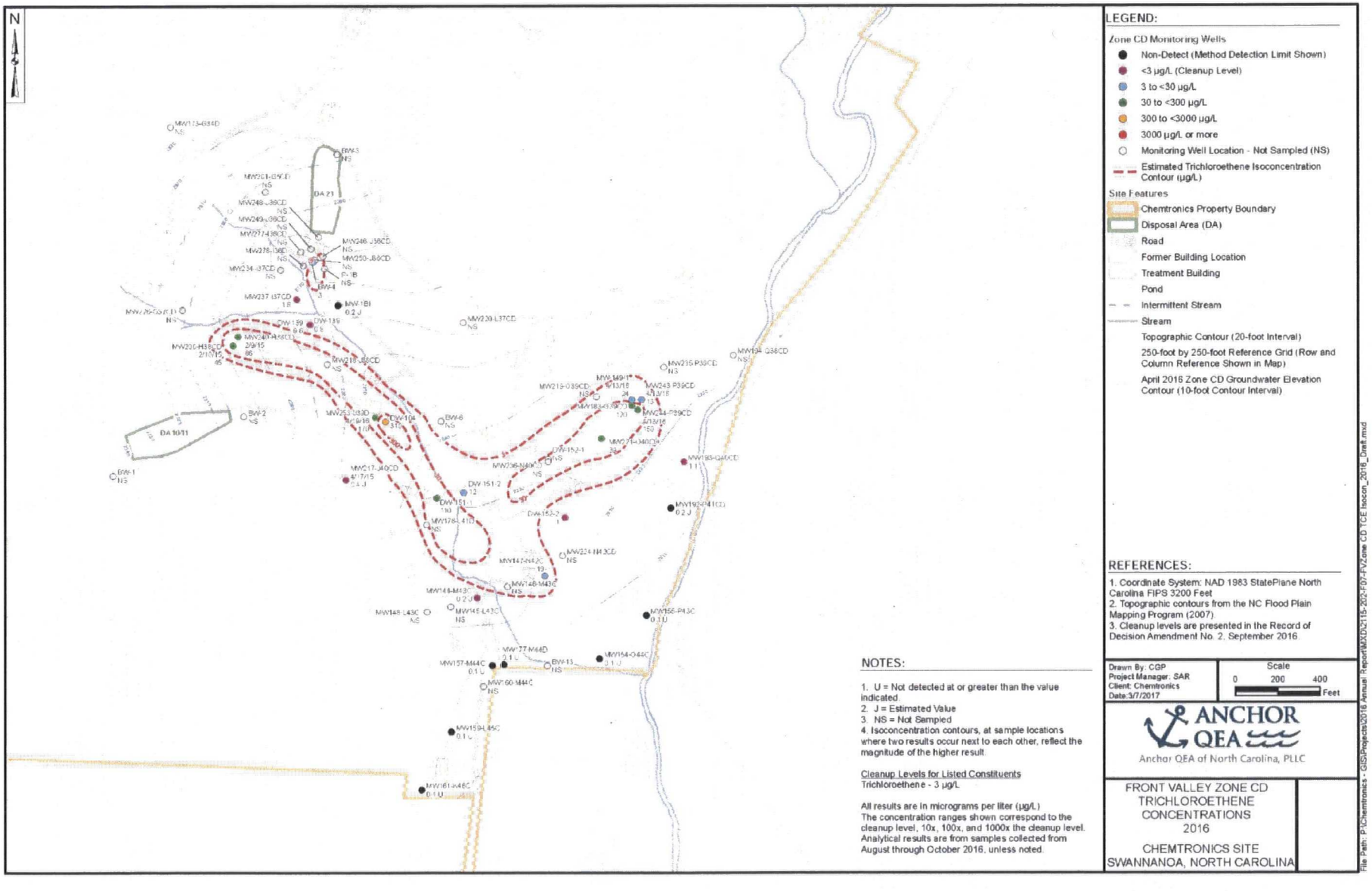


Figure 5: Extent of TCE in BV Surficial Aquifer Wells in 2016

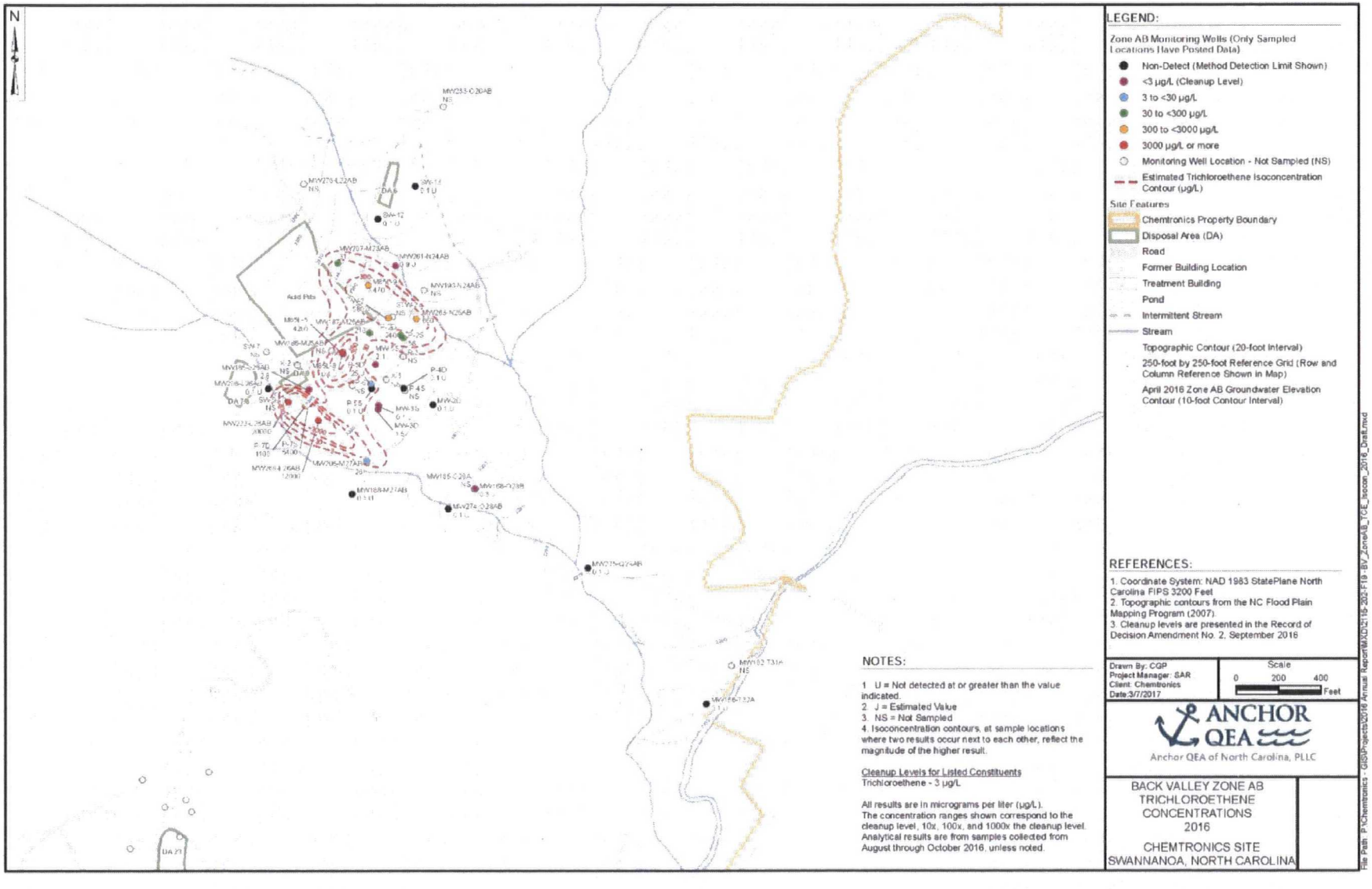
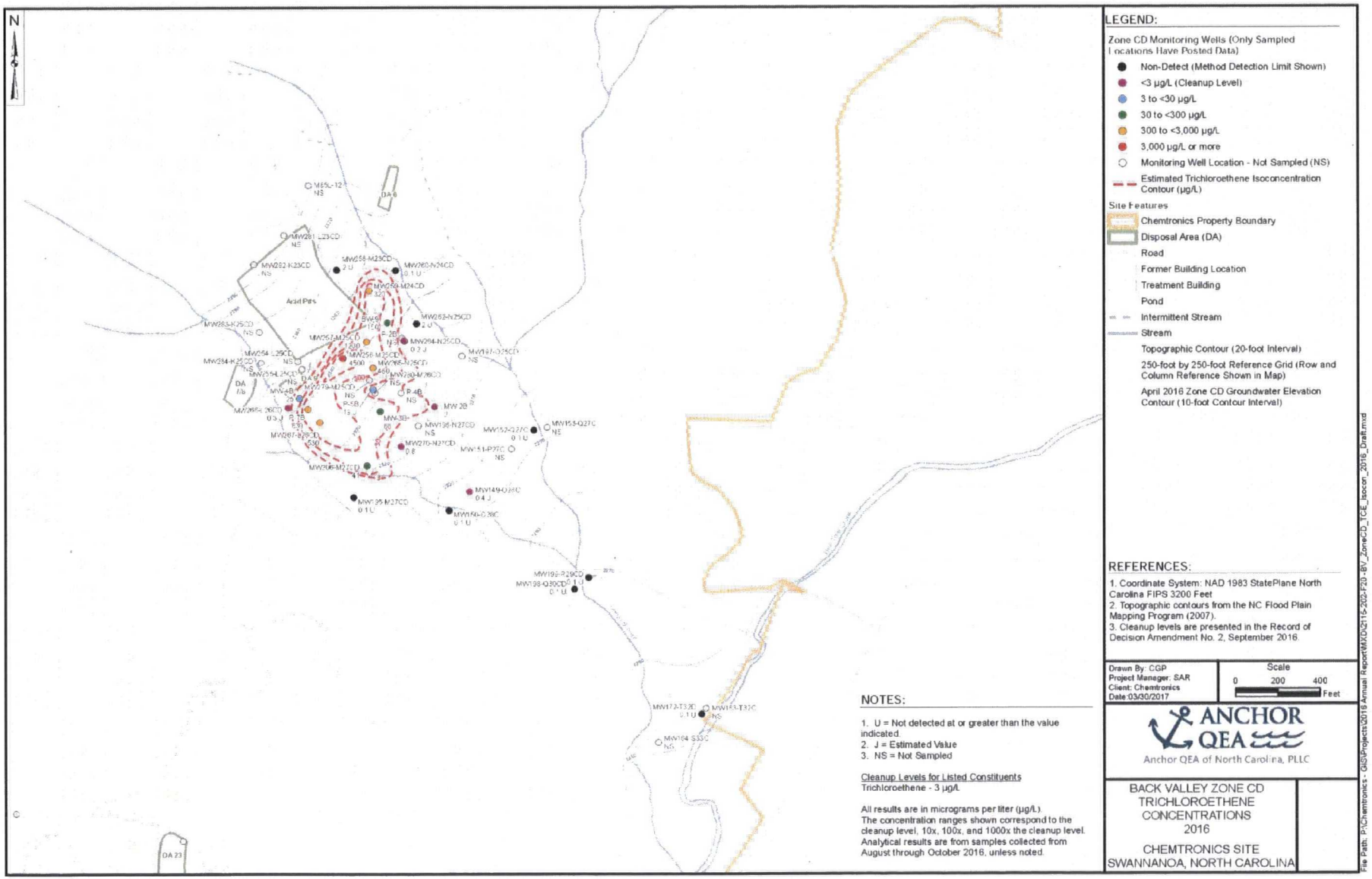


Figure 6: Extent of TCE in BV Transition Zone Aquifer Wells in 2016



Typically, the TBA plume within the BV Transition Zone Aquifer is confined to the area immediately downgradient of the APA (Figure 8). The recent cleanup level exceedances observed at the isolated location of MW172-T32D are not representative of typical site conditions. While the sampling performed in response to these atypical results confirmed that TBA concentrations in groundwater above the TBA cleanup level are not present in the off-site residential wells, continued close monitoring of that location is warranted to make sure that the COC does not migrate beyond the site boundary at that location. Additionally, a pilot test has been initiated in 2017 in the area between well BW-14 and well MW172-T32D. The results of this pilot test will be used to evaluate potential groundwater treatment options utilizing EISB. It is expected that the groundwater treatment will mitigate the potential for contaminant migration beyond the site boundary.

As part of the 2016 FS, contractor Geosyntec Consultants, Inc. confirmed that MNA is occurring at the Site using a multiple lines of evidence approach. The evaluation of both spatial and temporal trends in groundwater showed that COC concentrations in the FV and BV generally decrease with distance in each aquifer zone along the direction of groundwater flow, and that COC concentrations at most locations have declined over time throughout the BV and FV plumes. These observations are indicative of mass reduction and ongoing natural attenuation in FV and BV groundwater. For example, the concentration of TCE at Area B149 has steadily decreased due to natural attenuation, from 4,600 µg/L in October 2001 to 260 µg/L in November 2012, before the initiation of a EISB pilot test in the area. Following the initiation of the EISB pilot test in the area, the TCE concentration decreased further, to 19 µg/L as of September 2015. Based on these groundwater conditions, the revised groundwater remedy of targeted EISB and MNA is expected to address remaining site-related groundwater contamination.

Surface Water

The headwaters for the Unnamed Branch and Gregg Branch are located on the Chemtronics property. Both streams are perennial and discharge to Bee Tree Creek. TCE and perchlorate are among the most frequently detected site analytes in surface water. The results shown in Figures 9 and 10 (on pages 28 and 29) include the most recent results from each sampling point in 2016. While perchlorate concentrations and, at a lesser frequency, TCE concentrations exceed their respective North Carolina 2B surface water standards at on-site sampling locations along Gregg Branch and the Unnamed Branch, between 2012 and 2016, no site-related analytes were detected above the NC 2B standards at any of the five surface water sampling locations along Bee Tree Creek. Surface water monitoring location BTW 1-P45 is located just south of the site boundary along Bee Tree Creek (Figure 9). The lack of COC concentrations above the NC 2B standard at that farthest downgradient, off-site surface water sampling location supports the 2015 RI conclusion that transport of contaminants to off-site receptors via surface water is not a significant route of migration. However, the increased concentrations of perchlorate and RDX at sampling location BTW 1-P45 observed in August 2015 (Table 8) warrant close monitoring to make sure that COC concentrations at that location remain below the NC 2B standards. Table 8 below shows detections of COCs in surface water in Bee Tree Creek between 2012 and August 2016.

Surface water sampling point BTW 1-P45 is located downgradient of groundwater monitoring well MW154-O44C. RDX concentrations showed a slight increase in August in 2015 at MW154-O44C. The increase in RDX at surface water sampling point BTW 1-P45 in August 2015 may indicate that the elevated RDX concentrations observed in groundwater were discharging to Bee Tree Creek.

Figure 7: Extent of RDX in FV Transition Zone Aquifer in 2016

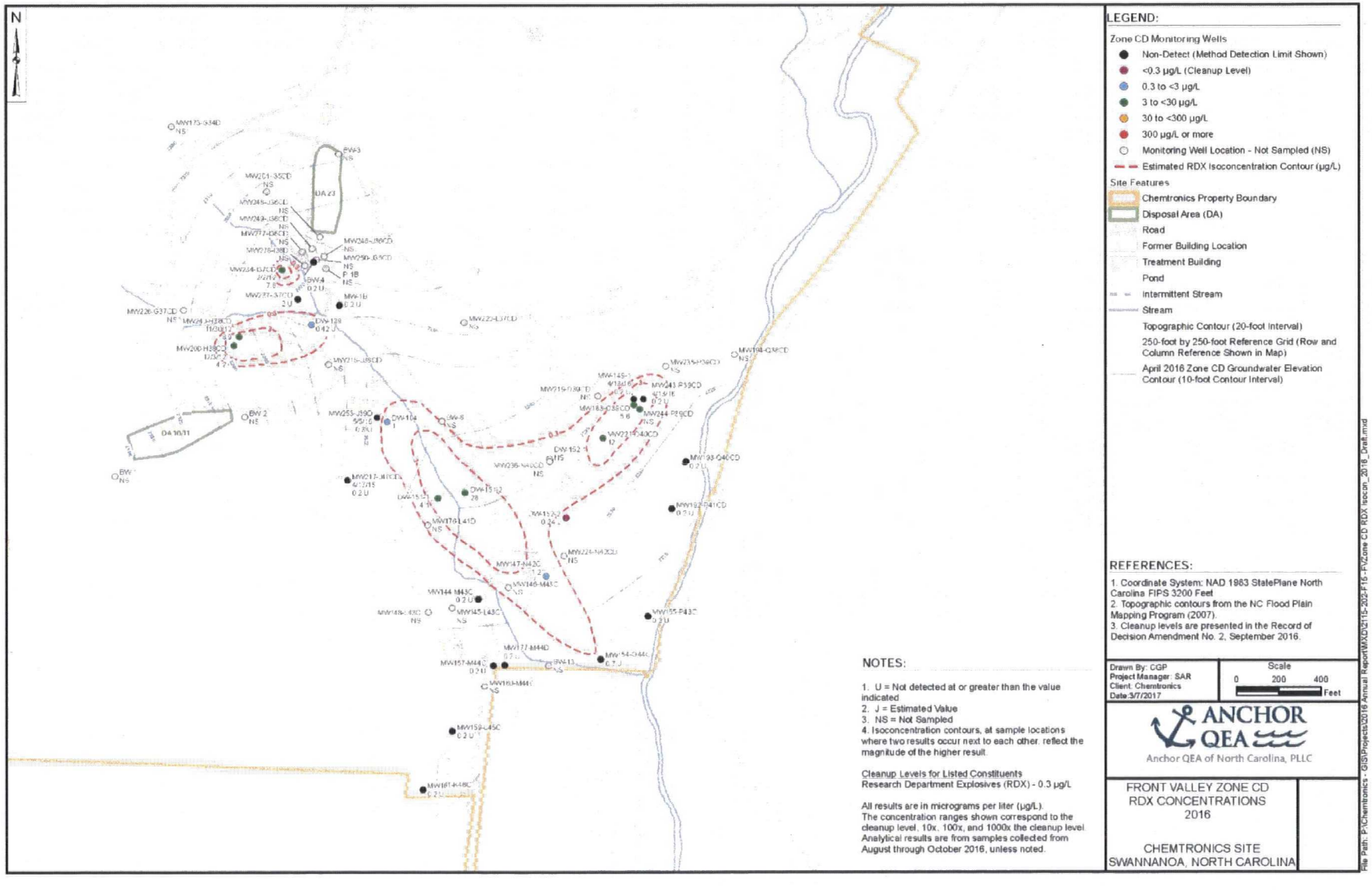


Figure 8: Extent of TBA in BV Transition Zone Aquifer in 2016

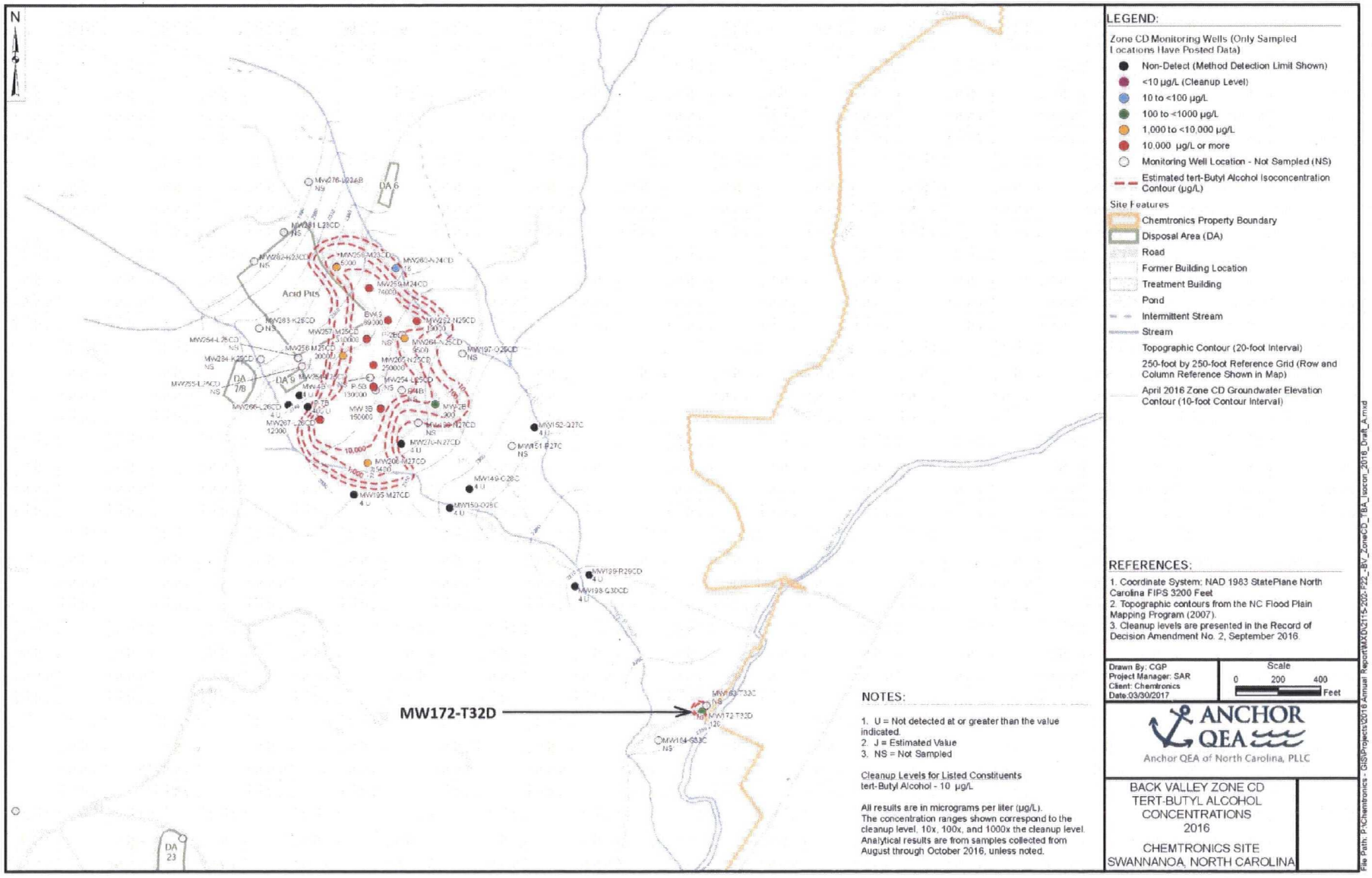


Table 8: COC Detections in Bee Tree Creek Surface Water (2012-2016)								
COC	2B Standard (µg/L)	Sampling Dates and Results (µg/L)						
		10/12/2012	10/30/2013	9/8/2014	8/20/2015	6/9/2016	8/29/2016	4/25/2017
BTW 2-S35								
Perchlorate	2.8	0.2 U	**0.69 J**	0.2 U	0.2 U	NS	0.2 U	NS
1,2-DCA	37	0.1 U	**0.2 J**	0.1 U	0.1 U	NS	0.1 U	NS
BTW 1-P44								
Perchlorate	2.8	0.2 U	**0.27 J**	0.2 U	**0.24 J**	**0.32 J**	**0.31 J**	**0.26 J**
BTW 1-P45								
Perchlorate	2.8	**0.33 J**	**0.5 J**	0.2 U	**1.9**	**0.67 J**	**0.51 J**	**1.3**
RDX	11	0.2 U	**0.25 J**	0.2 U	**2.3**	**0.77**	**0.49 J**	0.2 U
m,p-xylenes	670	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.1 J**	0.1 U

Notes:
Bold results indicate that the constituent was detected.
U = the constituent was not detected at a level greater than or equal to the level of the sample quantitation limit for the method
J = estimated result
µg/L = micrograms per liter
NS = not sampled

In August 2016, an isolated, estimated detection of 4-nitrotoluene (0.74 µg/L) was observed at surface water sampling location BTW 2A-T35. The 2B standard for that constituent is 18 µg/L. Also in August 2016, isolated, estimated detections of 1-nitronaphthalene were observed at sampling locations BTW 2-S35 (0.38 µg/L) and BTW 2A-T35 (0.52 µg/L). There is no 2B standard for 1-nitronaphthalene. These two wells are located along Bee Tree Creek.

The North Carolina 2B surface water standards are protective of human health; they are not applicable to ecological receptors. To evaluate potential risk to ecological receptors in Bee Tree Creek, the Unnamed Branch and Gregg Branch, this FYR compared concentrations of constituents detected in surface water between 2012 and 2016 to EPA Region 4 chronic freshwater screening values.[3] Screening values are not available for all detected surface water constituents, including perchlorate and TBA. Between 2012 and 2016, no constituent concentrations observed in Bee Tree Creek, the Unnamed Branch or Gregg Branch exceeded Region 4 chronic freshwater screening values. These findings indicate that surface water at the Site does not currently pose an unacceptable risk to ecological receptors.

During the RI, Anchor QEA collected surface water and sediment samples from the Unnamed Branch and Gregg Branch. Where possible, surface water and sediment samples were collected together at each sampling location. Anchor QEA collected surface water and sediment samples during low-stream-flow conditions and a high-stream-flow event. Under low-flow conditions, any detected contamination would be coming from groundwater discharging into the stream. The purpose of collecting samples under high-

[3] EPA Region 4 Surface Water Screening Values for Hazardous Waste Sites, included in EPA's 2015 Region 4 Ecological Risk Assessment Supplemental Guidance, accessed 3/14/2017: https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf.

Figure 9: Select COCs in FV Surface Water in 2016

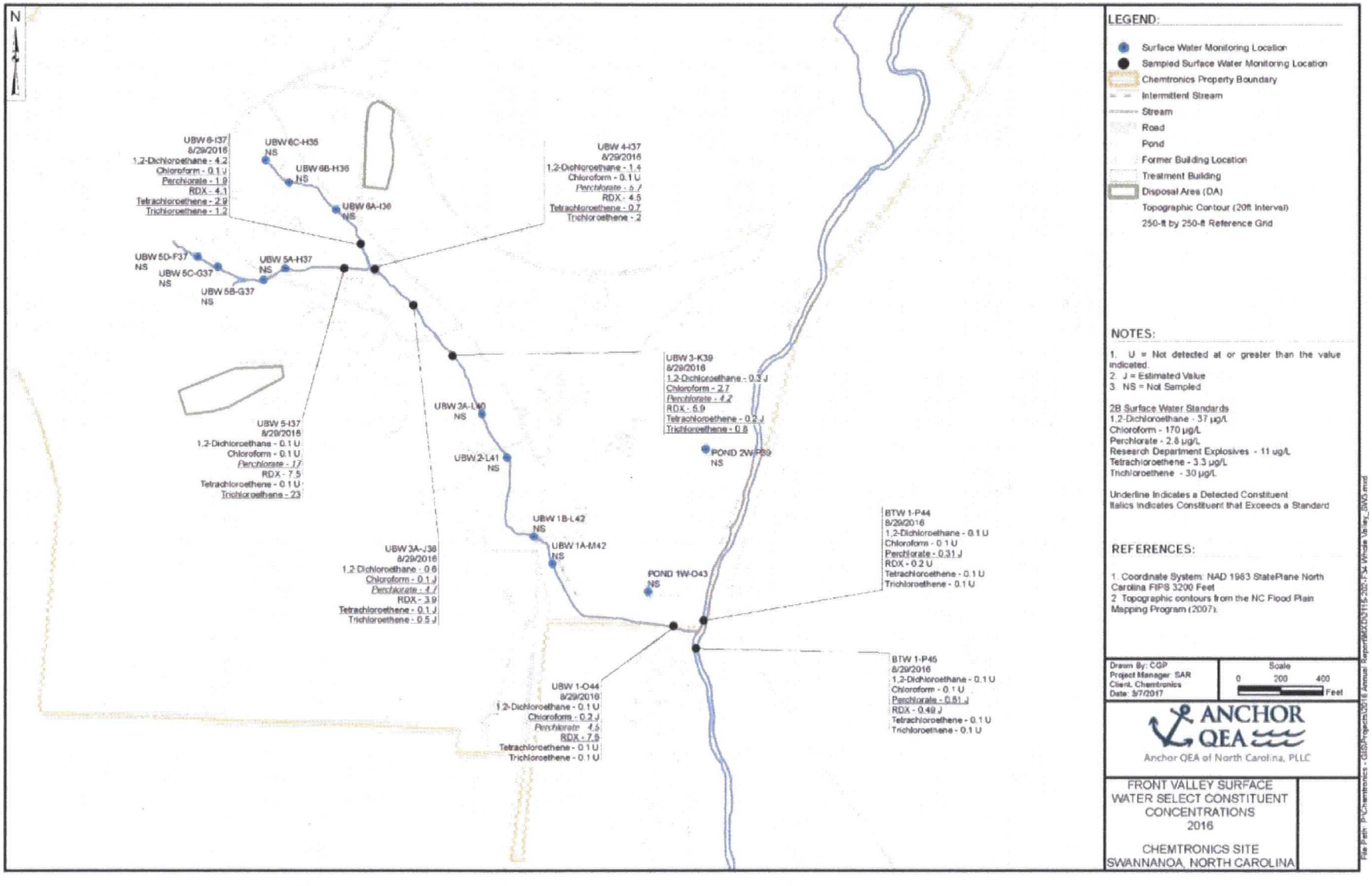
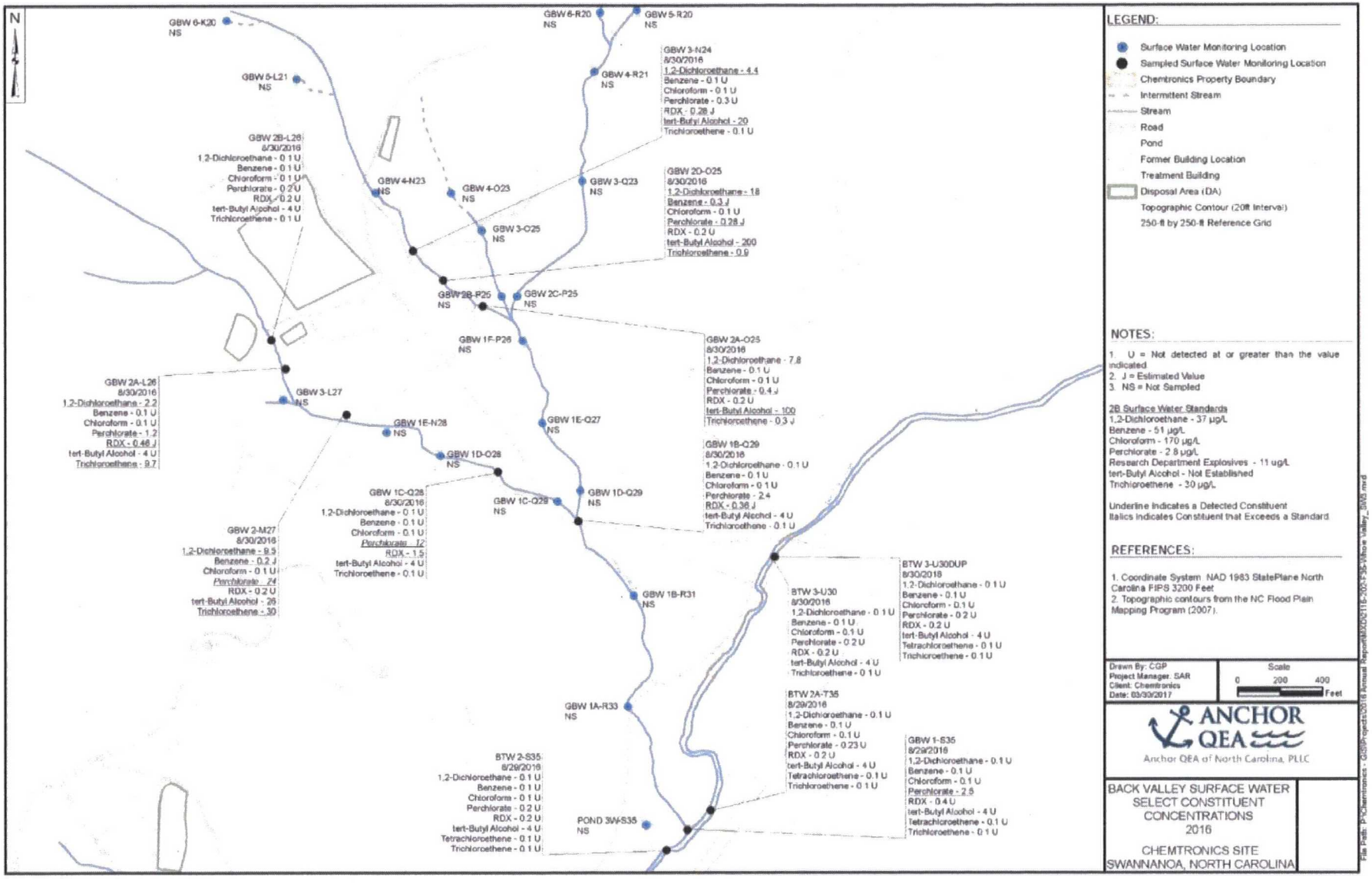


Figure 10: Select COCs in BV Surface Water in 2016



flow conditions was to determine if there were any unacceptable levels of contamination coming from surface runoff. According to the 2016 ROD Amendment, these data confirmed that neither surface water nor sediment is a source of contamination. The 2016 ROD Amendment concluded that the contaminants detected in the streams are either from the discharge of groundwater into the stream or surface runoff during storm events.

Site Inspection

The site inspection took place on 1/19/2017. In attendance were Jon Bornholm (EPA Region 4 RPM), Beth Hartzell (NCDEQ), Stuart Ryman, Robert Cork and Jonathan Ivey (Anchor QEA), and Melissa Oakley and Jill Billus (Skeo). The purpose of the inspection was to assess the protectiveness of the remedy. The site inspection checklist is included in Appendix F. Site inspection photographs are included in Appendix H.

The site inspection began at the FV maintenance shed with a safety and site information briefing. It included a tour of the following FV areas: Bee Tree Creek, the Unnamed Branch that drains to Bee Tree Creek, site ponds, signage, and disposal areas DA-10/11 and DA-23. It also included a tour of areas established in the 2016 ROD Amendment as needing active remediation, including Areas B104, B105, B109, B116 and B147. The site inspection included a tour of the following BV areas: Gregg Branch and surface water monitoring locations, disposal areas DA-6, DA-7/8, DA-9 and the APA, and the area downgradient of DA-9 and the APA, established in the 2016 ROD Amendment as needing active remediation.

Six-foot chain linked fences clearly marked with warning signage and secured with locked gates surround each of the six disposal areas. All fences were in good condition. The caps on the six disposal areas appeared to be in good condition, with no evidence of subsidence, cracking or burrowing within the caps observed. Vegetation on all capped areas appeared to be well-established, healthy and well-maintained. Site inspection participants observed a small area under the fence surrounding DA-10/11 where an animal has dug under the fence to access the capped area. However, no evidence of digging was observed on the actual cap. All monitoring wells were secured with locks and clearly labeled and appeared to be in good condition. All injection and extraction wells observed in pilot test areas were also secured and clearly labeled and appeared to be in good condition.

Site inspection participants also observed the inactive BV groundwater treatment system building, the metering manhole where samples of treated water are collected for analysis before the water is discharged to the MSD, the FV groundwater treatment system building, a pollinator habitat pilot project plot, and the off-site residential area along Old Bee Tree Road. The system components of the FV groundwater treatment system were clearly labeled and appeared to be in good condition. The groundwater treatment system building remains locked when not in use.

A PRP-led pollinator habitat pilot project near the main site entrance is currently exploring the possibility of establishing pollinator species on top of the disposal area caps. The pilot project test plot was partially covered with plastic sheeting to help prepare the soil for the next planting.

Access to parts of the Site are restricted by fencing and a secured front and back gate. The front gate and on-site access is monitored by a security guard stationed in a guard hut at the site entrance. The front gate is clearly posted with warning signage. Signs to deter trespassing and hunting are posted across the Site. No issues were observed during the site inspection that could potentially affect the protectiveness of the remedy.

Following the site inspection, EPA and Skeo staff visited the Site's local information repository, Warren Wilson College Library, located at 701 Warren Wilson Road in Swannanoa. A records review verified that a large collection of older printed site-related documents is available for public viewing. All site-related documents dated 2006 and later, including the 2012 FYR and the 2016 ROD Amendment, are available in disk form for public viewing.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:
The review of relevant documents, ARARs and risk assumptions and the site inspection indicate that once implemented, the new sitewide remedy selected in the 2016 ROD Amendment is expected to function as designed and address remaining site-related contamination. The soil component of the 1988 ROD is functioning as designed. There are no complete exposure pathways to contaminated media at the Site.

The capping and fencing of the DAs addressed soil that posed unacceptable risks to human health. Locked gates, fences and security personnel prevent unauthorized site entry. While performed outside of the scope of CERCLA, the demolition and off-site disposal of site structures and associated wastes further eliminated the potential for unacceptable risks to human health posed by the Site. While in operation, the FV and BV groundwater extraction and treatment systems prevented off-site migration of groundwater contamination and, to a certain extent, reduced COC concentrations in site groundwater.

Site groundwater is not used for any purpose. According to the 2016 ROD Amendment and the 2016 Annual Assessment Monitoring Report, groundwater data do not indicate off-site migration of site-related COCs at concentrations that exceed applicable groundwater criteria. In August 2015, RDX was present slightly above its cleanup level within the FV Transition Zone Aquifer near the Site's southeastern boundary (at well MW154-O44C). However, in spring of 2017, RDX at that same location was below the cleanup level of 0.3 µg/L. The most recent data show that RDX contamination appears to be confined within the site boundary. However, continued close monitoring of RDX concentrations at that location is warranted. It should be noted that the off-site property immediately south of well MW154-O44C, at 111 Old Bee Tree Road, is industrial and connected to the public water supply. Also, BV well MW172-T32D, which is located just inside of the Site's southeastern boundary, showed exceedances of the TBA cleanup level of 10 µg/L in 2015 and 2016. The sampling performed in response to these atypical results confirmed that TBA is not present in the residential wells located beyond the site boundary. However, continued close monitoring of that location is warranted to make sure that the COC does not migrate beyond the site boundary at that location. If TBA concentrations continue to increase at that location, sampling may be needed at locations downgradient of the well, beyond the site boundary, to fully delineate the extent of TBA in groundwater near well MW172-T32D. A pilot test was initiated between well BW-14 and well MW172-T32D. This results of this pilot test will be used to evaluate the potential for treating this contaminated groundwater utilizing EISB. It is expected that the groundwater treatment will mitigate the potential for contaminant migration beyond the site boundary.

Surface water data collected between 2012 and 2016 support the 2015 RI conclusion that transport of contaminants to off-site receptors via surface water is not a significant route of migration. In August 2015, an increase in perchlorate and RDX concentrations was observed at the farthest downstream

surface water sampling location (BTW 1-P45) in Bee Tree Creek. However, concentrations decreased at that location in 2016. The increase of RDX concentrations in surface water downgradient of well MW154-O44C (at BTW 1-P45) in August 2015 may indicate that the elevated RDX concentrations observed in groundwater at well MW154-O44C at that time were discharging to Bee Tree Creek. While the COC concentrations at that location remain below their respective North Carolina 2B standards, close monitoring is needed to make sure that COC concentrations remain below applicable standards at that location.

The 2016 ROD Amendment requires implementation of institutional controls to, at a minimum, limit land uses to commercial/industrial uses, restrict groundwater use and prevent the use of on-site groundwater for potable purposes. It also requires the creation of a plat map to identify the boundaries of the Superfund site. The PRPs have submitted draft institutional control language to NCDEQ for review and approval. Following approval, the PRPs will file and record the final institutional controls with Buncombe County.

The institutional controls required by the 2016 ROD Amendment do not specifically prohibit digging at the DAs established by the 1988 ROD. However, access to the DAs is restricted by fencing and neither the property owner nor the PRP contractor perform any activities on the DA caps that could potentially impact the integrity of the caps or result in direct exposure to contaminated subsurface soil. Restrictions to prohibit material disturbance, excavation or removal of material at the DAs should be considered in the final institutional controls.

While not required by the Site's 2016 remedy, the PRPs paid to extend the public water supply line to areas southeast and south of the Site and established restrictive covenants with several off-site property owners located downgradient of the Site between 2014 and 2016. The restrictive covenants prevent the use or extraction of groundwater from the subject properties, and require the closure of any existing wells. These actions further reduce the potential for future off-site exposure to groundwater contamination. They also help reduce the potential for off-site water wells to impact migration of groundwater contamination on site.

O&M activities are adequate and ensure the continued protectiveness of the remedy. Anchor QEA performs groundwater and surface water monitoring as required, cap settlement surveys indicate no evidence of cap subsidence at any of the DAs, and routine cap inspections and maintenance ensure the continued integrity of the DA caps. Upon implementation of the new sitewide remedy, it is expected that new O&M requirements will be established in an updated O&M Plan.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

Reviews of ARARs and toxicity changes as they might relate to the validity of cleanup goals were not needed during this FYR. Based on site information gathered during the 2015 RI, the September 2016 ROD Amendment identified new COCs based on current site conditions and established new cleanup levels based on current standards. The 2016 ROD Amendment established National Primary Drinking Water Standards (MCLs) and North Carolina 2L standards as chemical-specific groundwater ARARs and the North Carolina 2B standards as surface water ARARs.

The 2015 RI evaluated risks associated with vapor intrusion from site soil and groundwater. The 2015 RI identified two areas in the FV in need of additional soil remediation due to an unacceptable future risk associated with vapor intrusion of VOCs. The 2016 ROD Amendment established new risk-based soil cleanup levels for those two FV areas to specifically address the potential for future vapor intrusion. The 2015 RI also identified an unacceptable future risk due to vapor intrusion associated with site groundwater. The 2016 ROD Amendment established groundwater cleanup levels to address this future potential risk.

Shallow groundwater at parts of the Site is currently contaminated with concentrations of VOCs above the newly established cleanup levels. However, there are no routinely occupied enclosed structures on site, so there is no complete vapor intrusion exposure pathway under current conditions. The FV maintenance shed is located immediately northwest of building 152, just west of the pond (Figure 2). The security guard hut is located along the Site's southern boundary (Figure 2). Based on the current extent of groundwater contamination within the Surficial Aquifer, VOC-impacted groundwater is not present beneath, or within 100 lateral feet of the FV maintenance shed or the guard hut. Therefore, vapor intrusion does not pose a risk to workers in the shed or security personnel who use the guard hut. VOC contamination in shallow groundwater is not present within 100 lateral feet of downgradient residents; therefore, vapor intrusion does not pose a risk to off-site receptors.

Exposure assumptions at the Site remain valid. The EPA based the original 1988 soil cleanup goals and the new 2016 soil cleanup levels on commercial/industrial site use. The Site remains vacant and the PRPs have submitted draft institutional control language to NCDEQ for review and approval that will restrict site land uses to commercial/industrial use.

The ecological risk assessment, performed as part of the 2015 RI, concluded that community-level risks for ecological receptors are not expected on a broad scale. However, potential risks to ecological receptors at some isolated site locations could not be definitively ruled out. Section 7.2 of the 2016 ROD Amendment establishes specific monitoring requirements to ensure that site conditions do not pose unacceptable risks to ecological receptors. The 2016 ROD Amendment indicates that performance monitoring requirements will be finalized as part of the Performance Monitoring Plan during the remedial design. To evaluate potential risk to ecological receptors in Bee Tree Creek, the Unnamed Branch and Gregg Branch, this FYR compared concentrations of constituents detected in surface water between 2012 and 2015 to EPA Region 4 chronic freshwater screening values. Between 2012 and 2016, no constituent concentrations observed in Bee Tree Creek, the Unnamed Branch or Gregg Branch exceeded R4 chronic freshwater screening values. These findings indicate that surface water at the Site does not currently pose an unacceptable risk to ecological receptors.

The EPA has identified 1,4-dioxane as an emerging COC at Superfund sites. 1,4-Dioxane is a solvent used primarily in manufacturing operations. It is highly soluble in water, does not readily bind to soils and readily leaches to groundwater. It is also resistant to naturally occurring biodegradation processes. Due to these properties, a 1,4-dioxane plume is often much larger (and further downgradient) than the associated solvent/VOC plume. This FYR reviewed information regarding previous 1,4-dioxane sampling at the Site to determine if the constituent warrants additional consideration. During Phase I, II, and III of the Site's 2015 RI, the PRP contractor analyzed 512 soil samples and 63 groundwater samples for 1,4-dioxane. The constituent was not detected in any of those samples. Additional non-RI sampling efforts performed in 2003, 2004, 2007 and 2008, included analysis for 1,4-dioxane from both on-site locations and off-site domestic wells. The constituent was not detected in any of those samples. Based on this information, 1,4-dioxane has not been selected as a site COC and has been determined not to pose a risk to human health or the environment at the Site.

It is anticipated that the implementation of the new sitewide remedy will meet the RAOs established in the 2016 ROD Amendment.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
None.

Issues and Recommendations Identified in the FYR:

OU(s): **OU1 (Sitewide)**	**Issue Category: Institutional Controls**			
	Issue: The 2016 ROD Amendment requires implementation of institutional controls to, at a minimum, limit land uses to commercial/industrial uses, restrict groundwater use and prevent the use of on-site groundwater for potable purposes. The institutional controls have not yet been finalized.			
	Recommendation: Finalize institutional controls and record final institutional control documents with the Buncombe County Register of Deeds Office. The final institutional controls should prohibit material disturbance, excavation, or removal of material, and any other activities at the DAs that could potentially impact the integrity of the caps or result in unacceptable exposure to contaminated subsurface soil without the prior written permission of EPA and/or NC DEQ.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/NCDEQ	9/26/2018

Issues and Recommendations Identified in the FYR:

OU(s): OU1 (Sitewide)	Issue Category: Monitoring			
	Issue: BV well MW172-T32D, which is located along the Site's southeastern boundary, recently showed exceedances of the TBA cleanup level of 10 µg/L. Due to the close proximity of well MW172-T32D to a residential area on the other side of Bee Tree Creek, there is a potential for TBA to migrate beyond Bee Tree Creek at concentrations above the cleanup level. However, it should be noted that the PRPs sampled eight private wells in this residential area in 2017 and TBA was not detected at any of those private wells.			
	Recommendation: Continue to closely monitor TBA concentrations at MW172-T32D and surrounding monitoring wells. Implement the work plan submitted by the PRPs to EPA/NCDEQ in May 2017 to conduct an EISB pilot scale treatability study in the vicinity of monitoring well BW-14, which is located upgradient of well MW172-T32D. This treatability study will be similar in size and scope to the other treatability studies initiated by the PRPs during the RI/FS process. Implement work plan upon EPA approval.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/NCDEQ	9/26/2020

OTHER FINDINGS

In addition, the following recommendations were identified during the FYR. They do not affect current and/or future protectiveness:

- Figures currently included with routine monitoring reports typically show well locations and analytical results in relation to the larger Chemtronics property boundary. In order to more easily determine the extent of groundwater contamination as it relates to the boundaries of the Superfund site, the Site's boundaries should be added to future monitoring report figures.
- Concentrations of perchlorate and RDX in surface water in Bee Tree Creek at sampling location BTW 1-P45 increased in August 2015. While concentrations of those COCs at that location are below their respective North Carolina 2B standards, continue to closely monitor COC concentrations at that farthest downgradient surface water sampling location to make sure that COC concentrations do not increase to levels above the North Carolina 2B standards.
- Include the monitoring requirements established in Section 7.2 of the 2016 ROD Amendment in the Site's forthcoming Performance Monitoring Plan to ensure that site conditions do not pose unacceptable risks to ecological receptors.
- In September 2016, RDX was not detected at well MW154-O44C, however the laboratory method detection limit (0.7 µg/L) was higher than the RDX cleanup level of 0.3 µg/L. Work with the analytical laboratory to ensure that method detection limits are able to achieve site cleanup levels.

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement
Protectiveness Determination: Will be Protective
Protectiveness Statement: The sitewide remedy is expected to be protective of human health and the environment upon completion of the implementation of the 2016 ROD Amendment. In the interim, exposure pathways that could result in unacceptable risks are being controlled. The capping and fencing of the DAs addressed soil that posed unacceptable risks to human health, and site groundwater is not used for any purpose. A review of monitoring data and current site conditions confirm that there are no complete exposure pathways associated with surface water, groundwater or soil at the Site. However, in addition to the implementation of the new sitewide remedy selected by the 2016 ROD Amendment, the following actions are needed for the remedy to be protective over the long term: • Finalize institutional controls and record final institutional control documents with the Buncombe County Register of Deeds Office. The final institutional controls should prohibit material disturbance, excavation, or removal of material, and any other activities at the DAs that could potentially impact the integrity of the caps or result in unacceptable exposure to contaminated subsurface soil without the prior written permission of EPA and/or NCDEQ. • Continue to closely monitor TBA concentrations at MW172-T32D and surrounding monitoring wells. Implement the work plan submitted by the PRPs to EPA/NCDEQ in May 2017 to conduct an EISB pilot scale treatability study in the vicinity of monitoring well BW-14, which is located upgradient of well MW172-T32D. This treatability study will be similar in size and scope to the other treatability studies initiated by the PRPs during the RI/FS process. Implement work plan upon EPA approval.

VIII. NEXT REVIEW

The next FYR report for the Chemtronics, Inc. Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

2012 Annual Assessment Monitoring Report, Chemtronics Site, Swannanoa, Buncombe County, North Carolina. Prepared by Altamont Environmental, Inc. for Chemtronics, Inc., Northrop Grumman Systems Corporation and CNA Holdings LLC. May 13, 2013.

2013 Annual Assessment Monitoring Report, Chemtronics Site, Swannanoa, Buncombe County, North Carolina. Prepared by Altamont Environmental, Inc. for Chemtronics, Inc., Northrop Grumman Systems Corporation and CNA Holdings LLC. May 28, 2014.

2014 Annual Assessment Monitoring Report, Chemtronics Site, Swannanoa, Buncombe County, North Carolina. Prepared by Altamont Environmental, Inc. for Chemtronics, Inc., Northrop Grumman Systems Corporation and CNA Holdings LLC. April 8, 2015.

2015 Annual Assessment Monitoring Report, Chemtronics Site, Swannanoa, Buncombe County, North Carolina. Prepared by Altamont Environmental, Inc. for Chemtronics, Inc., Northrop Grumman Systems Corporation and CNA Holdings LLC. April 4, 2016.

2016 Annual Assessment Monitoring Report, Chemtronics Site, Swannanoa, Buncombe County, North Carolina. Prepared by Anchor QEA for Chemtronics, Inc., Northrop Grumman Systems Corporation and CNA Holdings LLC. March 31, 2017.

Chemtronics CERCLA Site Quarterly Status Report for March through May 2015. Altamont Environmental, Inc. June 10, 2015.

Chemtronics CERCLA Site Quarterly Status Report for June through August 2015. Altamont Environmental, Inc. September 10, 2015.

Chemtronics CERCLA Site Quarterly Status Report for January through March 2016. Altamont Environmental, Inc. April 10, 2016.

Chemtronics CERCLA Site Quarterly Status Report for July through September 2016. Altamont Environmental, Inc. October 10, 2016.

Chemtronics CERCLA Site Quarterly Status Report for October through December 2016. Anchor QEA of North Carolina, PLLC. January 10, 2017.

Front Valley and Back Valley Extraction Well and Treatment System Temporary Shutdown Report. Prepared by Altamont Environmental, Inc. for Chemtronics, Inc., Northrop Grumman Systems Corporation and CNA Holdings LLC. January 15, 2016.

Monitoring Report for Temporary Shutdown of the Front and Back Valley Extraction Wells and Treatment Systems. Prepared by Altamont Environmental, Inc. for Chemtronics, Inc., Northrop Grumman Systems Corporation and CNA Holdings LLC. June 15, 2015.

Monthly MSD Sewer Discharge Compliance Report – July 2015, Chemtronics CERCLA Site, Swannanoa, North Carolina. August 7, 2015.

Record of Decision Amendment, Chemtronics Superfund Site, Swannanoa, Buncombe County, North Carolina. U.S. Environmental Protection Agency. September 29, 2016.

Superfund Record of Decision: Chemtronics, NC. United States Environmental Protection Agency. April 5, 1988.

Superfund Record of Decision Amendment: Chemtronics, NC. United States Environmental Protection Agency. April 26, 1989.

Third Five-Year Review Report, Chemtronics Superfund Site, Swannanoa, Buncombe County, North Carolina. U.S. Environmental Protection Agency. September 26, 2012.

APPENDIX B – CURRENT SITE STATUS

Environmental Indicators
- *Current human exposures at the Site are under control.* - *There are insufficient data to determine if current groundwater migration is under control.*

Are Necessary Institutional Controls in Place?
☐ All ☐ Some ☒ None

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?
☐ Yes ☒ No

Has the Site Been Put into Reuse?
☐ Yes ☒ No

APPENDIX C – SITE CHRONOLOGY

Table C-1: Site Chronology

Event	Date
Industrial operations began at the Site	1952
State ordered Chemtronics to stop discharges to all disposal trenches	1980
The EPA added the Site to the NPL	September 8, 1983
U.S. Army's Toxic and Hazardous Materials Agency collected samples from two drums exposed at surface of DA 10/11	1984
PRPs began the Site's RI/FS	January 2, 1985
PRPs, Chemtronics and Northrop Grumman Systems Corporation entered AOC to perform Site's RI/FS	October 21, 1985
PRPs completed Site's RI/FS. The EPA signed Site's ROD	April 5, 1988
EPA issues Unilateral Administrative Order to the PRPs, Chemtronics, Northrop Grumman Systems Corporation and CNA Holdings, Inc., to perform remedial action	March 22, 1989
PRPs began Site's remedial design	March 23, 1989
The EPA signed ROD Amendment	April 26, 1989
PRPs completed Site's remedial design and began remedial action	June 10, 1991
PRPs completed Site's remedial action. The EPA issued Site's Preliminary Close-Out Report	March 25, 1993
PRP contractor RUST Environmental finalized Site's O&M Manual	December 1997
The EPA completed Site's first FYR Report	September 27, 2002
PRPs completed Holistic Site Management Plan to provide direction regarding future investigation and remediation efforts	January 2003
North Carolina Division of Natural Resources Hazardous Waste Section requested that the EPA consolidate oversight of all site environmental remediation activities under CERCLA authority	March 9, 2007
The EPA completed Site's second FYR Report	September 27, 2007
PRPs Chemtronics, Northrop Grumman Systems Corporation and CNA Holdings, Inc. entered AOC to perform the sitewide RI/FS and started sitewide RI/FS	October 25, 2008
PRPs completed Building Demolition and Waste Removal Report documenting non-CERCLA building demolition and waste removal performed between 2004 and 2006	2009
PRPs voluntarily upgrade public water supply line serving Old Bee Tree Road and connect one resident.	2014
The EPA completed Site's third FYR Report	September 26, 2012
PRPs shut down FV and BV groundwater extraction and treatment systems to allow for collection of data under non-pumping conditions	September 25, 2014
PRPs completed sitewide RI	December 21, 2015
PRPs voluntarily connect three residents along Lauren Ridge Way to public water supply line.	2016

Event	Date
PRPs completed sitewide FS, including implementation of pilot tests at B104, B105, B139, B147, B149, DA-23/B116, and downgradient of DA-9 and the APA.	July 11, 2016
The EPA approved the FS	July 25, 2016
The EPA signed ROD Amendment	September 29, 2016

APPENDIX D – SOIL AND GROUNDWATER COCS AND CLEANUP LEVELS ESTABLISHED IN THE 2016 ROD AMENDMENT

Table D-1: Soil COC Cleanup Levels Established in the 2016 ROD Amendment

TABLE 14 CLEANUP LEVELS FOR CHEMICALS OF CONCERN IN SOIL					
Chemicals of Concern (COCs) Associated with Soil at Area B109-B137, Chemtronics Superfund Site, Swannanoa, NC					
Chemical Group	**Chemical**	**Cleanup Level (µg/kg)**	**Source of Cleanup Level**	**Associated Routine Worker Vapor Intrusion Risk at this Level**	**Associated Routine Worker Vapor Intrusion HQ at this Level**
Volatile Organic Compounds	Naphthalene	7,600	Max detect; HI for respiratory system	1.9×10^{-5}	0.52
	1,2,4-Trimethyl-benzene	12,000	HI for blood	N/A	0.57
	1,3,5-Trimethyl-benzene	8,300	HI for blood	N/A	0.37
	Xylenes (total)	7,600	Max detect; HI for nervous system	N/A	0.29
Chemicals of Concern (COCs) Associated with Soil at Area B116, Chemtronics Superfund Site, Swannanoa, NC					
Volatile Organic Compounds	Benzene	6,300	Max detect; HI for immune system	3.6×10^{-5}	0.43
	Cyclohexane	1,300,000	HI for developmental effects	NA*	0.45
	1,2-Dichloroethane	1,500	HI for nervous system	3.0×10^{-5}	0.45
	Methylene chloride	4,800	Max detect	3.5×10^{-8}	0.016
	1,1,2-Trichloroethane	2,900	Max detect	3.4×10^{-5}	NA*
	Vinyl chloride	4,000	Max detect; HI for liver	1.3×10^{-5}	0.082

Key
N/A – COC is not a carcinogen
NA* – COC has no inhalation toxicity value of the relevant (cancer or noncancer) type.
Cleanup levels include the segregation of HQs by target organ/effect. The cleanup level is defined so that the total HI for a given target organ (including the HQ for all COCs with that target organ and the combined HQ of all non-COC chemicals) is no greater than 1.

Table D-2: Groundwater COC Cleanup Levels Established in the 2016 ROD Amendment

TABLE 15 CLEANUP LEVELS FOR CHEMICALS OF CONCERN IN GROUNDWATER					
Chemical Group	**Chemical**	**NC 2L**	**Health-Based Limit**	**Cleanup Level**	**Source of Cleanup Level**
Volatile Organic Compounds	Acetone	6,000 µg/L	--	6,000 µg/L	NC 2L
	Benzene	1 µg/L	--	1 µg/L	NC 2L
	Bromoform (THM –Trihalomethane)	4 µg/L	--	4 µg/L	NC 2L
	Chloroform (THM)	70 µg/L	--	70 µg/L	NC 2L
	Carbon Tetrachloride	0.3 µg/L		0.3 µg/L	NC 2L
	Dibromochloromethane (THM) #	0.4 µg/L	--	0.4 µg/L	NC 2L
	1,2-Dichloroethane	0.4 µg/L	--	0.4 µg/L	NC 2L
	cis-1,2-Dichloroethene	70 µg/L	--	70 µg/L	NC 2L
	1,2-Dichloropropane	0.6 µg/L	--	0.6 µg/L	NC 2L
	Methyl acetate #	--	7,000 µg/L	7,000 µg/L	HB-NC
	Methyl-tert-butyl ether	20 µg/L	--	20 µg/L	NC 2L
	Methylene chloride	5 µg/L	--	5 µg/L	NC 2L
	t-Butyl alcohol	10 µg/L *	--	10 µg/L *	NC 2L (IMAC)
	Tetrachloroethylene	0.7 µg/L	--	0.7 µg/L	NC 2L
	Tetrahydrofuran	--	6000 µg/L	6,000 µg/L	HB-NC
	1,1,2-Trichloroethane	0.6 µg/L *	--	0.6 µg/L *	NC 2L (IMAC)
	Trichloroethylene	3 µg/L	--	3 µg/L	NC 2L
	Vinyl chloride	0.03 µg/L	--	0.03 µg/L	NC 2L
	2,4-Dinitrophenol	--	10 µg/L	10 µg/L	HB-NC
	1,2-Diphenylhydrazine #	--	0.04 µg/L	0.04 µg/L	HB-C
	Benzophenone #	--	30 µg/L	30 µg/L	HB-NC
	N-nitrosodimethylamine	0.0007 µg/L	--	0.0007 µg/L	NC 2L
	BZ (3-Quinuclidinyl benzilate)	--	0.8 µg/L	0.8 µg/L	HB-NC
PCB	PCBs (total) #	0.09 µg/L *	--	0.09 µg/L *	NC 2L (IMAC)
Nonhalogenated Organics	1,2-Diaminoethane	--	600 µg/L	600 µg/L	HB-NC
	Methanol	4,000 µg/L	--	4,000 µg/L	NC 2L
Nitroaromatics	2-Amino-4,6-dinitrotoluene	--	0.05 µg/L	0.05 µg/L	HB-C
	4-Amino-2,6-dinitrotoluene	---	0.05 µg/L	0.05 µg/L	HB-C
	1,3-Dinitrobenzene	--	0.7 µg/L	0.7 µg/L	HB-NC
	2,4-Dinitrotoluene	0.1 µg/L		0.1 µg/L	NC 2L (IMAC)
	2,6-Dinitrotoluene	--	0.1 µg/L	0.1 µg/L	HB-C
	RDX	--	0.3 µg/L	0.3 µg/L	HB-C
	3-Nitrotoluene	--	7 µg/L	7 µg/L	HB-NC
	2-Nitrotoluene	--	0.2 µg/L	0.2 µg/L	HB-C
	4-Nitrotoluene #	--	2 µg/L	2 µg/L	HB-C
	PETN	--	10 µg/L	10 µg/L	HB-NC
	Nitroglycerin	--	0.7 µg/L	0.7 µg/L	HB-NC
	2,4,6-Trinitrotoluene	--	1 µg/L	1 µg/L	HB-C
	Perchlorate	2 µg/L *		2 µg/L *	NC 2L (IMAC)

TABLE 15 CLEANUP LEVELS FOR CHEMICALS OF CONCERN IN GROUNDWATER

Notes:

Where available for a compound, the promulgated NC 2L standards are, in all instances, equal to or lower (i.e., more protective) than MCLs.

Health-based limits are provided if promulgated NC 2L standards are not available. Health-based limits were calculated during the baseline risk assessment. Health-based limits have been rounded to one significant figure to represent the level of precision.

Cleanup levels are based upon the North Carolina health-based NC 2L standards or health-based (HB) limits calculated using the formulas specified under the NC 2L regulations at 15 NCAC 02L.0202(d)(I) and (2) for those COCs without a NC 2L standard. Note that the COCs for which a NC 2L standard is not available also do not have Federal MCLs.

HB-C: Health-based limit that is based on a target cancer risk of 1×10^{-6}.

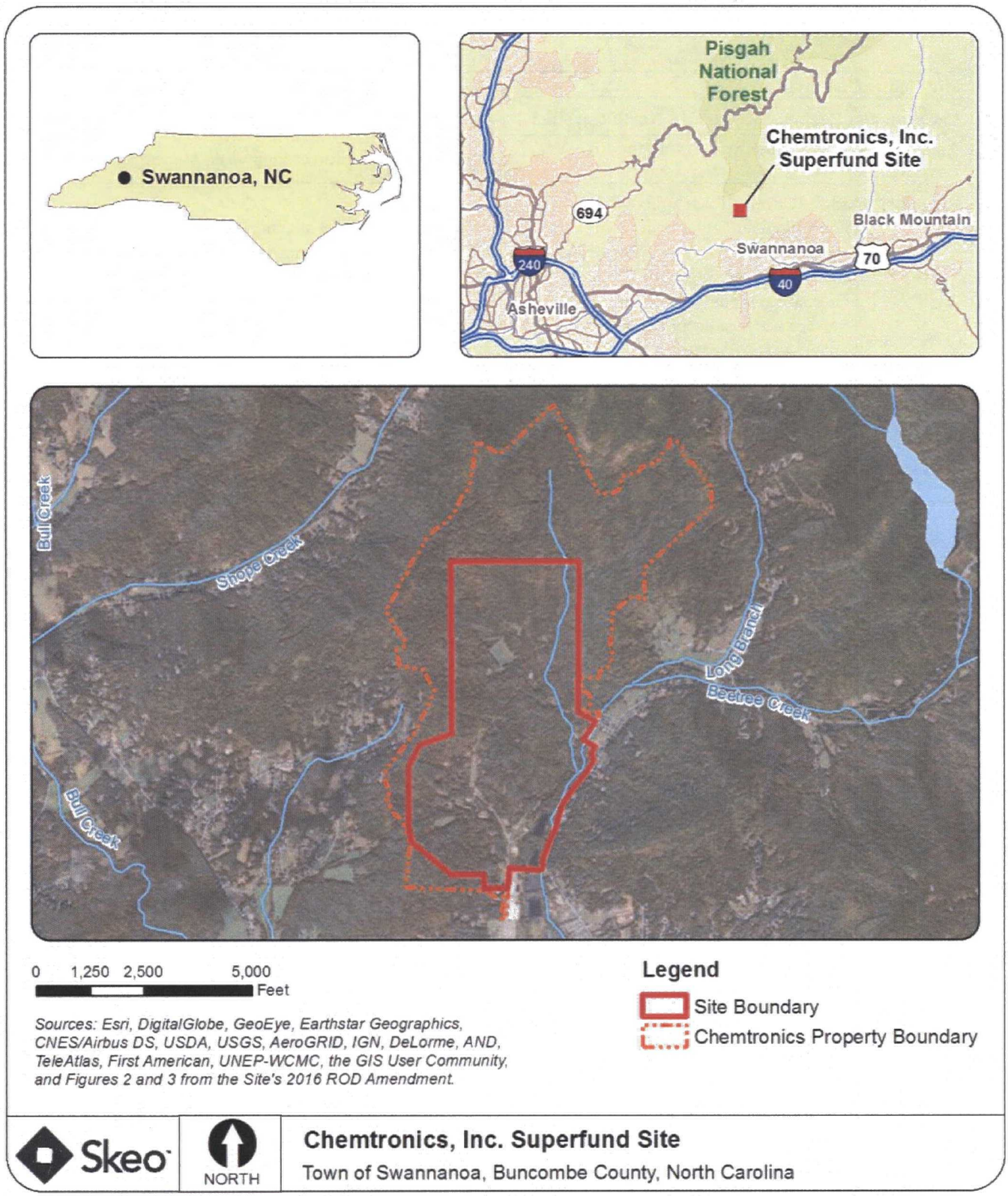
HB-NC: Health-based limit that is based on non-cancer effects at a target hazard quotient of 1.

* Value is an Interim Maximum Allowable Concentration (IMAC) established under 15A NCAC 02L .0202.

\# A COC only under the residential potable groudwater exposure scenario. COC may be removed from list once institutional controls are in place limiting groundwater exposure to industrial workers

APPENDIX E – SITE VICINITY MAP

Figure E-1: Site Vicinity Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

APPENDIX F – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Chemtronics, Inc.	**Date of Inspection:** 01/19/2017
Location and Region: Swannanoa, North Carolina 4	**EPA ID: NCD095459392**
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** Sunny and 60 degrees

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☒ Other: The original groundwater remedy, as established by the Site's 1988 ROD, included the extraction and treatment of contaminated groundwater and the capping of six former disposal areas. The revised remedy, as established by the 2016 ROD Amendment, includes enhanced in-situ bioremediation, long-term monitoring and MNA to address groundwater contamination at specific site areas; excavation and off-site disposal of contaminated soil at two FV locations; and institutional controls to restrict site land uses to commercial/industrial use only and to prohibit the use of site groundwater.

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☒ by email Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency NCDEQ
   Contact Beth Hartzell (Name) | Project Manager (Title) | 03/20/2017 (Date) | 919-707-8335 (Phone No.)
   Problems/suggestions ☐ Report attached: Interview question responses can be found in Appendix I and summarized in Section IV.

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☐ Report attached: Interview question responses can be found in Appendix I and are summarized in Section IV.

Jon Bornholm, EPA RPM

Residents and Swannanoa Superfund Community Advisory Group Members

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks: PRP contractor maintains hard copies of the Site's O&M Plan and site-related maintenance logs and inspection forms on site in the FV maintenance shed. As-build drawings can be found in remedial design documents.

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A

☒ Contingency plan/emergency response plan ☒ Readily available ☒ Up to date ☐ N/A

Remarks: PRP contractor maintains hard copies of the Site's site-specific health and safety plan and emergency response plan on site in the FV maintenance shed. The Site's health and safety plan was last updated in August 2015.

3. **O&M and OSHA Training Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: PRP contractor maintains hard copies of O&M and OSHA training records and certifications on site in the FV maintenance shed.

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☒ Effluent discharge	☒ Readily available	☒ Up to date	☐ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: The Site discharges any treated water from the FV groundwater treatment system to the MSD under an active MSD permit (permit #G-006-13).

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☒ Readily available ☐ Up to date ☐ N/A

Remarks: PRP contractor performs cap settlement surveys every five years. The last survey took place in 2017. No evidence of excessive settlement was observed. The next settlement survey is scheduled

to take place in 2022.

7. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: Since the shutdown of the Site's groundwater extraction and treatment system in 2014, groundwater and surface water has been monitored semi-annually. Monitoring also includes quarterly surface water sampling, active sampling of pilot test areas, and annual monitoring of an additional 18 wells, as required by the Site's current O&M Plan. All monitoring records are readily available and are submitted to the EPA for review.

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☐ N/A
☒ Water (effluent)	☒ Readily available	☒ Up to date	☐ N/A

Remarks: PRP contractor submits discharge compliance records to the MSD as required.

10. **Daily Access/Security Logs** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: Daily access/security logs are maintained at the security guard hut at the site entrance. All individuals who enter the Site are required to sign in at the guard gate.

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house	☐ Contractor for state
☐ PRP in-house	☒ Contractor for PRP
☐ Federal facility in-house	☐ Contractor for Federal facility

☒ PRP contractor, Anchor QEA of North Carolina PLLC, performs all site-related O&M activities.

2. **O&M Cost Records**

☒ Readily available	☒ Up to date
☐ Funding mechanism/agreement in place	☐ Unavailable

Original O&M cost estimate: See the Systems Operations/Operation & Maintenance section in the main FYR for detail regarding the original O&M cost estimates. ☒ Breakdown attached

Total annual cost by year for review period if available

Year: 2012	Total cost: $424,000
Year: 2013	Total cost: $315,000
Year: 2014	Total cost: $312,000
Year: 2015	Total cost: $197,000
Year: 2016	Total cost: $164,000

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☒ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: All site fencing appears to be in good condition. Gates are secured with locks.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: The front gate and on-site access are monitored by a security guard stationed in a guard hut at the site entrance. The front gate is clearly posted with warning signage. Signs to deter trespassing and hunting are posted throughout the Site. The Site is manned by security personnel 24 hours a day. Security personnel perform routine site security inspections.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Not applicable.

Frequency: _____

Responsible party/agency: The PRP is responsible for implementing institutional controls.

Contact			
Name	Title	Date	Phone no.
_____	_____	_____	_____

Reporting is up to date	☐ Yes	☐ No	☒ N/A
Reports are verified by the lead agency	☐ Yes	☐ No	☒ N/A
Specific requirements in deed or decision documents have been met	☐ Yes	☒ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: The 2016 ROD Amendment requires the implementation of institutional controls to restrict site land uses to commercial/industrial uses only and to prevent the potable use of site groundwater. The PRP has submitted proposed restrictive covenant language to NCDEQ for review and approval. Following approval of the institutional control language, the restrictions will be finalized and recorded with Buncombe County. While not required by any site decision documents, the PRP paid to prepare and record restrictive covenants with several off-site property owners located east of the Site. The restrictive covenants prevent the use or extraction of groundwater from the subject properties, and require the closure of any existing wells. The purpose of the restrictive covenants is to prevent the possibility of private off-site wells to potentially impact the location of Site-related groundwater contamination. These voluntary actions by the PRP aim to further eliminate the potential for future off-site exposure to groundwater contamination. The institutional controls required by the 2016 ROD Amendment do not specifically prohibit digging at the DAs established by the 1988 ROD. However, access to the DAs is restricted by fencing and neither the property owner nor the PRP contractor perform any activities on the DA caps that could potentially impact the integrity of the caps or result in direct exposure to contaminated subsurface soil. Restrictions to prohibit digging at the DAs should be considered in the final institutional controls.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: During the previous five years, vandalism has not taken place at the Site. Trespassing occurs rarely. Routine security patrols and signage help deter trespassing.

2. **Land Use Changes On Site** ☐ N/A

Remarks: The site property remains vacant. However, since the previous FYR, the PRP contractor has begun a pollinator habitat pilot project near the main site entrance to explore the possibility of establishing pollinator species on top of the disposal area caps.

3. **Land Use Changes Off Site** ☒ N/A

Remarks: While there has been some growth of the surrounding residential areas, off-site land use has remained the same since the previous FYR. There are plans underway to establish a conservation easement area on the Chemtronics property that is not part of the designated Superfund site in the future. Once established, the conservation easement area will be used for sustainable forestry practices.

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: Site roads seem adequate. They are inspected and maintained as part of routine site O&M activities.

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☒ Settlement not evident

Area extent: _____ Depth: _____

Remarks: Settlement was not observed on any of the six disposal area caps.

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident

Lengths: _____ Widths: _____ Depths: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident

Area extent: _____ Depth: _____

Remarks: _____

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established

☒ No signs of stress ☐ Trees/shrubs (indicate size and locations on a diagram)

Remarks: Vegetation on all capped areas appeared to be well-established, healthy and well-maintained. Site inspection participants observed a small area under the fence surrounding DA-10/11 where an animal has dug under the fence to access the capped area. However, no evidence of digging was observed on the actual cap.

6. **Alternative Cover** (e.g., armored rock, concrete) ☒ N/A

Remarks: _____

7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Area extent: _____
	☐ Ponding	☐ Location shown on site map	Area extent: _____
	☐ Seeps	☐ Location shown on site map	Area extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Area extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Area extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☒ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☒ N/A
	(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type:_____		Area extent: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
	Area extent: _____		Depth: _____

Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions

☐ Location shown on site map Area extent: _____

Size: _____

Remarks: _____

6. **Excessive Vegetative Growth** Type: _____

☐ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Area extent: _____

Remarks: _____

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☒ Passive

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☒ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: There are passive gas vents located in the APA cap. The vents have been sampled twice to determine if the disposal area beneath the cap emits gases. Gases have never been detected. The vents are no longer monitored.

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: With the exception of two wells located on the outer edge of DA-23, monitoring wells are not located within the surface of the capped waste disposal areas.

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☒ Routinely surveyed ☐ N/A

Remarks: PRP contractor performs cap settlement surveys every five years. The last survey took place in 2017. No evidence of excessive settlement was observed. The next settlement survey is scheduled to take place in 2022.

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☒ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: Per the EPA's approval, the original FV and BV groundwater extraction and treatment systems are no longer in operation. Currently, injection and extraction wells are operated as part of pilot tests for areas identified in the 2016 ROD Amendment as needing active remediation.

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☒ Air stripping ☒ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☒ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☒ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: PRP contractor currently operates the FV groundwater treatment system in a limited capacity, primarily to treat purge water generated during sampling activities. The two on-site groundwater treatment systems are no longer used to treat groundwater from the groundwater extraction systems.

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☒ Good condition ☒ Proper secondary containment ☐ Needs maintenance

Remarks: The tanks and storage vessels in the FV groundwater treatment system buildings are clearly labeled and appear to be in good condition. The floor of the building is coated and designed to serve as secondary containment for the system.

4. **Discharge Structure and Appurtenances**

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair

☒ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: Site groundwater is no longer being extracted and treated. See below, under Section E, for well condition information related to MNA.

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: All monitoring wells were secured with locks, clearly labeled and appeared to be in good condition.

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The remedy selected in the Site's 1988 ROD included groundwater extraction and treatment and capping of disposal areas. The placement of caps over the six disposal areas identified in the 1988 ROD has effectively eliminated the potential for exposure to soil contamination. The groundwater on site is not used; therefore, there is no complete direct exposure pathway for site groundwater. Off-site residents located along Bee Tree Road have been connected to the public water supply and restrictive covenants are in place to prevent future use of groundwater for those properties. The revised remedy, as selected in the 2016 ROD Amendment, includes EISB and MNA to address groundwater contamination at selected FV and BV areas; excavation and off-site disposal of contaminated soil from two FV locations; institutional controls to restrict site land uses to commercial/industrial uses only and to prevent the use of groundwater on site; maintenance of the caps and engineering controls for the six DAs as required by the 1988 ROD; and performance monitoring. The 2016 sitewide remedy has not yet been implemented, but is expected to address remaining site contamination and to be protective of human health and the environment once implemented.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

No issues were observed related to O&M implementation. The capped areas, fencing, signage, roads and equipment associated with remedial activities seem to be well-maintained. Site monitoring is performed in accordance with all site-related monitoring requirements. Section 7.2 of the 2016 ROD Amendment establishes specific monitoring requirements to ensure that site conditions do not pose unacceptable risks to ecological receptors. The 2016 ROD Amendment indicates that performance monitoring requirements will be finalized as part of the Performance Monitoring Plan during the remedial design.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

There have been no issues or observations that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Opportunities for optimization have not been identified.

APPENDIX G – PRESS NOTICE

COMMUNITY CALENDAR

STAFF REPORTS

GET LISTED: Share your events at CITIZEN-TIMES.com/events at least two weeks in advance of publication.

July 11

Concerts on the Quad: Featuring Joe Lasher Jr. at 7 p.m. at UNC Asheville. Free. 828-251-6674 or unca.edu/concerts.

Transition Asheville Social: 6:30-8 p.m., St. Mary's Episcopal Church, 337 Charlotte St., Asheville. Topic is Laudato Si: A Conversation about Pope Francis Encyclical led by Karen Richardson Dunn.

Pottery camp for kids: July 11-15, Transylvania Community Arts Council, 349 S. Caldwell St., Brevard. 9 a.m.-noon for ages 6-10 and 1:30-4:30 p.m. for ages 10-15. $225. Learn and practice basic hand-building skills. 828-884-2787.

Organic Cultivation & Gardening: July 11-14, 10 a.m.-5 p.m., Earthaven Ecovillage, 5 Consensus Circle, Black Mountain. Learn to cultivate food and generate living systems as a foundational part of sustaining health, well-being, and life on our planet. $705. http://thepermaculturesschool.org/permaculture-school-2016-workshops/.

Local Cribbage Group: 6 p.m. Mondays, Atlanta Bread Company, 633 Merrimon Ave., Asheville. Learn to play cribbage. All levels and ages welcome. Relaxed group. Mostly noncompetitive. Contact Donald Dahms at 404-580-2941 or Asheville.mountain.peggers@gmail.com.

July 12

Just Brass: 7:30 p.m., Brevard Music Center, 349 Andante Lane, Brevard. A brass-travanganza with faculty and students. $25, lawn $15. www.brevardmusic.org.

Shag lessons and dancing: Every Tuesday at 550 Tavern & Grille, 550 Airport Road, Fletcher. Free lesson 6:30-7 p.m. No partner needed. Rotating DJ's 7-10 p.m. $5 cover charge. 828-298-9382 or www.mountainshagclub.com.

Mountain High Republican Women's Club luncheon meeting: 11:30 a.m., Wildcat Cliffs Country Club, Cashiers. Featured speaker is Supreme Court Justice Bob Edmunds. For reservations, information and to join, call 828-743-1658 or email mtnrepublicanwomen@yahoo.com.

Basic Dog Training class: 7-8 p.m. Tuesdays, Pampered Pets Inn & Spa, 1318 Eliada Home Road, Asheville. Led by Appalachian Tails Dog Training. This course lasts for six sessions. Can be joined any Tuesday with no need to wait for start dates. $135. 828-338-9962 or www.avldogs.com.

Learn about composting: 5:30 p.m., Canton Branch Library, 11 Pennsylvania Ave., Canton. Gardening talk to learn to use kitchen scraps, leaves and lawn waste to create gardener's gold that will enrich your soil. Free. 828-648-2924.

July 13

Junior Forester Program: 10:30 a.m.-12:30 p.m., Cradle of Forestry, U.S. 276 S., Pisgah Forest. Every Wednesday to Aug. 10. Nature-oriented program for ages 8-12. Explores topics related to orienteering, forestry and forest health. $4 per child, $2.50 for accompanying adults. 828-877-3130 or http://www.cradleofforestry.com/events.

Waterfalls & Wine tours: Noon-4 p.m. Wednesdays until Aug. 31. Meet in parking lot at 190 E. Main St., Brevard. Pisgah Field School will guide you to off the beaten path waterfalls. End the trip in downtown Brevard with a private wine tasting at Broad Street Wines. $50. 828-884-3443 or http://pisgahfield.com.

Poetry open mic: 8 p.m., The Altamont Theatre, 18 Church St., Asheville. Noble Kava pop up kava bar and poetry open mic hosted by Caleb Beissert. Age 18 and older. Free. 617-501-1983 or www.thealtamontheatre.com.

Salsa, Sabor y Salud!: 10 a.m.-noon Wednesdays until Aug. 3, YWCA, 185 S. French Broad Ave., Asheville. Latino families, learn to eat more healthy and participate in fun physical activity. This program is led solely in the Spanish language. To sign up, call Leah Berger-Singer at 828-254-7206, ext. 212. Also free gym membership each week you attend.

July 14

Arden Rotary Club: 7:30 a.m., Fletcher YMCA, 2775 Hendersonville Road, Fletcher. Meets every Thursday. www.ardenrotaryclub.org.

COURTESY KEVIN ADAMS

Enjoy a Literary Lunch about finding the best waterfalls and wildflowers in WNC with Kevin Adams, outdoor author and photographer on July 14 at Henderson County Public Library, 301 N. Washington St., Hendersonville. The event is free. 828-697-4725.

Literary Lunch with Kevin Adams, outdoor author and photographer: Henderson County Public Library, 301 N. Washington St., Hendersonville. About finding the best waterfalls and wildflowers in WNC. Free. 828-697-4725.

Asheville Rotary Club: Noon-1:30 p.m., Renaissance Hotel, 31 Woodfin St., downtown. N.C. Board of Transportation member David Brown will discuss the I-26 Connector project. http://www.rotaryasheville.org.

Yappy Hour: 6-8 p.m., Moe's Original BBQ in Woodfin. $5 donation. Bring your pup and mingle with fellow dog lovers. www.ashevillehumane.org.

Plumbing Skill Share: 6-7:30 p.m., Living Web Farms, 176 Kimzey Road, Mills River. We will cover preparation and sweating of copper pipe with silver solder, where and why to use different types of copper. Other options include use of PEX and oxygen-barrier PEX, PVC/CPVC, NPT iron and brass, and SharkBite products. We can also discuss polybutylene pipe, tubing, and flare-fitting. $10 suggested donation. 828-891-4497 or http://livingwebfarms.org/workshops/skill-share-plumbing/.

Buncombe County Senior Democrats: 6-8 p.m., Buncombe County Democratic Party headquarters, 951 Old Fairview Road, Asheville. To discuss political issues pertinent to seniors. 828-505-0691.

July 15

Music On Main Street and car show: 7-9 p.m. Fridays to Aug. 19, Visitors Center, 201 S. Main St., Hendersonville. Hendersonville Antique Car Club will showcase vintage and antique cars. Free. http://visithendersonvillenc.org/music_on_main.htm.

In Sights: An Evening of Mind Reading: July 15-16, 7:30 p.m., North Carolina Stage Company, 15 Stage Lane, Asheville. Michael Spremulli takes the art of personality profiling to another dimension. He credits his heightened intuitive abilities to being born with a severely diminished sense of vision. $10-$24. 828-239-0263 or www.ncstage.org/productions/sights-evening-mind-reading/.

Georgia Mountain Fair: July 15-23, Georgia Mountain Fairgrounds, 1311 Music Hall Road, Hiawassee, Geaorgia. $12, free ages 12 and younger, $33 three-day pass, $90 nine days. Free parking. Music included in ticket price. Midway rides additional charge-$20 wristband. 706-896-4191 or www.georgiamountainfairgrounds.com.

July 16

Square dance: 6 p.m., Whitmire Activity Center, 301 Lily Pond Road, Hendersonville. Hosted by Southern Lights Square and Round Dance Club. Find us on Facebook. Summer workshops ng held 7-9 p.m. every Tuesday at the Salvation Army Gym, North Grove Street.

Glance reunion: Noon at Beaverdam Community Center, 1620 North Canton Road, Canton. Bring a dish to share. https://www.facebook.com/events/1056031264468238/.

Officers search for missing Candler teen

DALE NEAL
DNEAL@CITIZEN-TIMES.COM

Hayson Tapp

ASHEVILLE - Buncombe COunty sheriff's deputies are seeking information to locate a Candler teenager who has been missing since Friday.

Hayson Blaine Tapp, 13, of Candler, is a 5-foot 8-inch, 130-pound white male, with brown hair and brown eyes. Hayson was last seen wearing a blue jersey-type T-shirt with an "A" on the upper left chest, dark blue checkered pajama-type pants with a white pinstripe and brown worn work boots. Hayson was last seen leaving his residence on Starnes Cove Road on Friday and may be in the Enka-Candler area, according to a release on the sheriff's office Facebook page.

Anyone who has seen Hayson or has any information regarding his whereabouts, please notify the Buncombe County Sheriff's Office at 828-255-5050.

Asheville police arrest man on burglary charges

DALE NEAL
DNEAL@CITIZEN-TIMES.COM

ASHEVILLE - Police have charged an Asheville man with breaking into a building, damaging the interior and stealing furniture, toys and other items, warrants show.

Jodie Lee Cummings, 39, of Rock Hill Circle, was charged with breaking and entering a building on Rock Hill Road on Saturday, stealing assorted furniture, antiques, electronics and other items, according to warrants filed at the Buncombe County Magistrate's Court. He was also charged with damage to property, including a kitchen sink, cabinets, walls and doors. He was being held in the Buncombe County Detention Facility with a secured bond set at $20,000.

Cummings is scheduled to make his first appearance Monday in Buncombe County District Court.

Black Mountain man arrested on meth charges

DALE NEAL
DNEAL@CITIZEN-TIMES.COM

SWANNANOA - Buncombe County sheriff's deputies arrested a Black Mountain man Saturday on drug charges, warrants show.

Maxwell Sherman Morris

Maxwell Sherman Adai Morris, 24, of Willowbrook Drive, was arrested in the 100 block of U.S. 70 and and charged with possession of methamphetamine and other Schedule II drugs, according to the Buncombe County Sheriff's Department.

He was being held in the Buncombe County Detention Facility with a secured bond set at $50,000 on all charges. He was scheduled to make his first appearance Monday in Buncombe County District Court.

In other drug arrests:

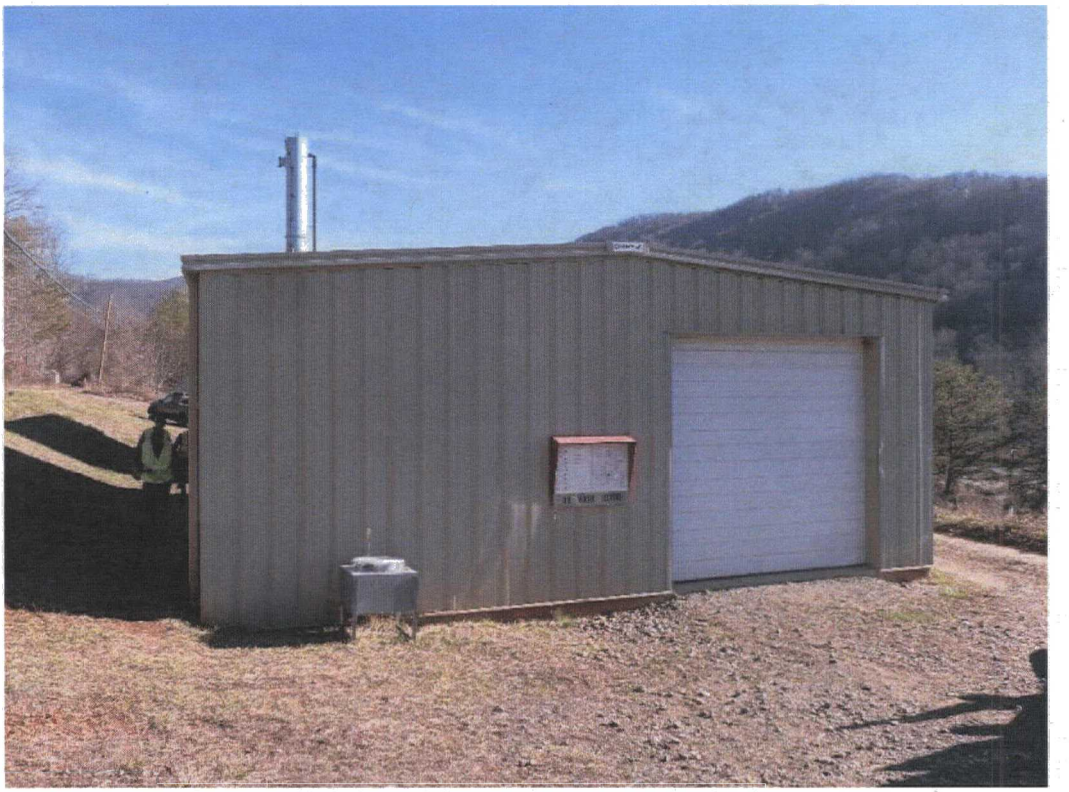
» Tamika Nicole Carmady, 24, of Onteora Boulevard, Asheville, was charged with possession of methamphetamine, a glass meth pipe and plastic baggies. She was being held under $5,000 secured bond.

» Jessica Earlene West, 24, of Old Shoals Road, Arden, was charged with possession of methamphetamine and a glass meth pipe. She was being held with bond set at $4,000.

APPENDIX H – SITE INSPECTION PHOTOS

A locking gate, marked clearly with warning signage, restricts access to the Site.

Upon site entry, all visitors must sign in with the security guard at this hut at the front gate.



Exterior of the FV maintenance shed.

PRP contractor Anchor QEA maintains training records, O&M inspection records and manuals, monitoring reports, and the site-specific health and safety plan on site at the FV maintenance shed.

FV groundwater monitoring well MW-202, secured with a lock, clearly labeled and in good condition.

Examples of signs posted across the Site.

Area B104: pilot study location and one of the FV areas selected in the 2016 ROD Amendment for active remediation.

A locking gate and tall fence topped with barbed wire restrict access to FV disposal area DA-10/11. Warning signage is clearly posted on the fence that surrounds the cap.

The fence that surrounds DA-10/11 appeared to be in good condition.

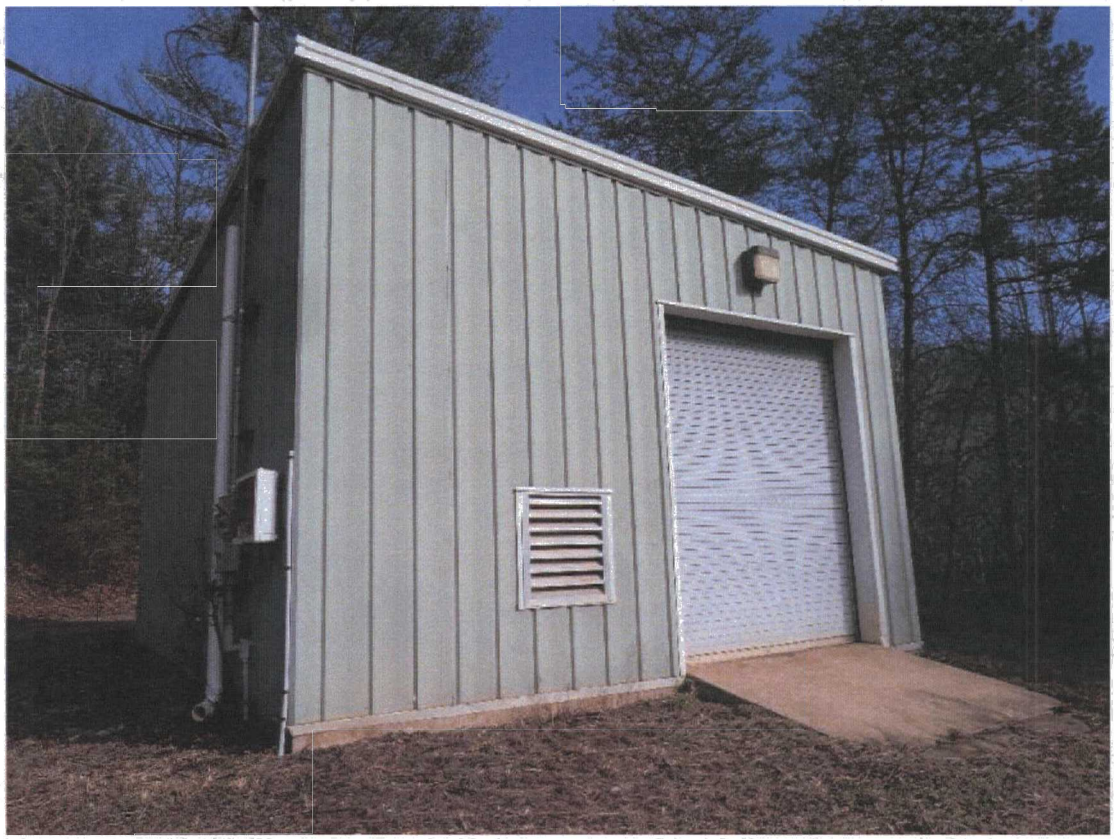
Small dug-out area under the fence that surrounds DA-10-11. Animals sometimes dig under the fence, but do not dig on the surface of the cap.

A locking gate and tall fence topped with barbed wire restrict access to FV disposal area DA-23. Warning signage is clearly posted on the fence that surrounds the cap. The APA, DA-6, DA-7/8 and DA-9 were also observed during the site inspection. Each of those DAs are also surrounded by tall fences, secured with locked gates and clearly marked with warning and DA identification signs.

The surface of the cap covering DA-23. The caps covering the APA, DA-6, DA-7/8 and DA-9 were also observed and found to be in good condition.

Area B109, shown above, is one of the FV areas selected in the 2016 ROD Amendment for active soil remediation.

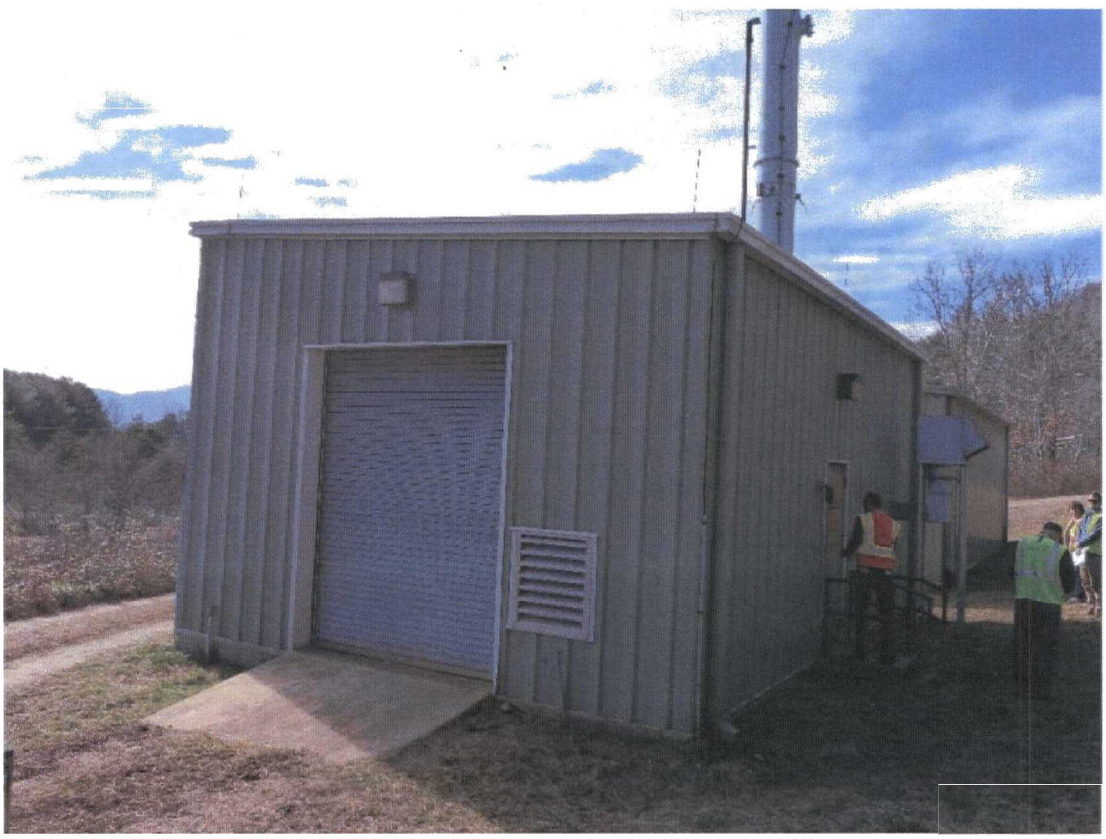
The area shown above is downgradient of the APA in the BV. It is one of the BV areas selected in the 2016 ROD Amendment for active groundwater remediation.



The BV groundwater treatment system is no longer in operation.

Surface water sampling location in Gregg Branch Creek.

Bee Tree Creek along the eastern edge of the Site, near MW172-T32D.



The FV groundwater treatment system building.

Groundwater treatment system components inside the FV groundwater treatment system building.

Pollinator habitat test plot near the site entrance.

APPENDIX I – INTERVIEW FORMS

Chemtronics, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: Chemtronics, Inc. **EPA ID No.:** NCD095459392

Interviewer Name: _____ **Affiliation:** _____
Subject Name: Jon Bornholm **Affiliation:** EPA RPM
Subject Contact Information: bornholm.jon@epa.gov
Time: _____ **Date:** 1/27/2017
Interview Location: _____

Interview Format (underline one): **In Person** **Phone** **Mail** **Other: Email**

Interview Category: **EPA Remedial Project Manager**

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   The effectiveness of the pump-and-treat systems, one in each valley, required by the 1988 ROD was moderate. The following capped disposal areas have not adversely impacted groundwater quality: DA 6, DA 7/8 and DA 10/11. Contaminants continue to migrate/leach into the groundwater from the other three capped DAs: DA 9/ DA 23 and the APA. The site-wide RI/FS successfully led to the issuance of the 2016 ROD Amendment No. 2. The site-wide RI/FS identified some additional groundwater contamination in areas of the Site that were not investigated as part of the earlier RI/FS. As part of the site-wide RI/FS, numerous EISB pilot-scale treatability studies were initiated – five studies in the FV and one study in the BV. The PRPs are continuing four of the EISB pilot-scale treatability studies in the FV as well as the one BV study. The fifth EISB study in the FV successfully treated the levels and is now being monitored.

   PRPs are maintaining the property and there is a 24-hour, seven-day-a-week guard on site. Since the pump-and-treat systems were shut down in 2014, site personnel conduct the following activities: EISB study monitoring, routine maintenance of capped areas/roads and annual monitoring. The 2016 ROD Amendment No. 2 split the Chemtronics property into the Chemtronics Superfund site portion (the Site) and the Chemtronics property portion. All known contamination in the soil and groundwater are contained within the Site's boundaries, which encompasses 535 acres. The Chemtronics property portion encompasses 530 acres. Chemtronics, the owner of the property, has been working with the Southern Appalachian Highlands Conservancy to place a conservation easement on the property. Land use restrictions will also be placed on the Site through the State's DPLUR process. Model DPLUR language was included in the 2008 AOC negotiated between the EPA and the PRPs.

2. What have been the effects of the Site on the surrounding community, if any?

   None that I have been made aware of.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?

The following concerns/questions were expressed by the community during the 60-day public comment period on the Proposed Plan:

- *Past disposal practices/disposal areas.*
- *Past manufacturing activities.*
- *Areas of concern/contamination.*
- *Size/stability of identified plumes and defining extent of contamination.*
- *Length of remedial action/monitoring.*
- *Institutional controls/site boundary/redevelopment of Site and/or property.*
- *Truck traffic/wear and tear on roads.*

These were addressed in the Responsiveness Summary of the 2016 ROD Amendment #2.

The EPA and the PRPs have been active participants in Swannanoa Superfund Community Advisory Group meetings by giving presentations and conducting question-and-answer sessions.

4. What is your assessment of the current performance of the remedy in place at the Site?

   As stated above, the pump-and-treat systems were marginally successful. Data collected on the EISB studies shows that EISB should successfully treat the contaminants in the groundwater. The primary drawback of this technology is the length of time to achieve cleanup levels. The RI/FS estimated a timeframe of 30 to 70 years to achieve RAOs (i.e., groundwater cleanup levels) for all areas being addressed.

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

   The 1988 ROD did not require institutional controls. The 2008 AOC and the 2016 ROD Amendment #2 require placement of DPLURs on the Superfund portion of the Site.

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.

   Refer to question #3 above.

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   No.

8. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?

   Yes.

Site Name: Chemtronics, Inc. **EPA ID No.:** NCD095459392

Interviewer Name: _____ **Affiliation:** _____
Subject Name: Beth Hartzell **Affiliation:** Project Manager, NCDEQ
Subject Contact Information: beth.hartzell@ncdenr.gov
Time: _____ **Date:** 3/20/2017
Interview Location: _____

Interview Format (underline one): In Person Phone Mail Other: Email

Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   The project seems to be progressing smoothly, especially with the signing of the ROD Amendment #2.

2. What is your assessment of the current performance of the remedy in place at the Site?

   The remedy chosen under the ROD Amendment #2 looks like a very good remedy. The remedial design has not been completed.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

   No.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

   Working on the RI, FS and ROD. The result is the ROD Amendment.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?

   No.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

   The State is currently reviewing the land use restriction language that will be put in place at the site as a result of the ROD Amendment.

7. Are you aware of any changes in projected land use(s) at the Site?

   No.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   No.

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?

   Yes.

Chemtronics Superfund Site **Five-Year Review Interview Form**

Site Name:	Chemtronics	**EPA ID No.:**	
Interviewer Name:		**Affiliation:**	
Subject Name:	[redacted]	**Affiliation:**	w/in Smile Radius of Site CAG Member
Subject Contact Information:	[redacted]		
Time:		**Date:**	02/10/17
Interview Location:			

Interview Format (circle one): In Person Phone (Mail) Other:

Interview Category: Residents

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? Yes

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? The Pump+Treat (while effective) was slow. I'm encouraged by the data shown on BioRemediation.

3. What have been the effects of this Site on the surrounding community, if any? Mixed. For people living in the area, it was a Mysterous Site. The CAG Meetings + EPA updates are welcome + makes the property less mysterious.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? I don't live close enough to the Property to know.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? Yes
   How can EPA best provide site-related information in the future? I'm a member of the Suwannee Superfund CAG + EPA has regularly Attended meetings + been responsive via email.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used? No.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project? Not Currently.

Chemtronics Superfund Site **Five-Year Review Interview Form**

Site Name: Chemtronics **EPA ID No.:**

Interviewer Name: _____ **Affiliation:** _____

Subject Name: [redacted] **Affiliation:** _____

Subject Contact Information: _____

Time: 1:00 **Date:** 2-10-2017

Interview Location: [redacted]

Interview Format (circle one): In Person Phone (Mail) Other:

Interview Category: Residents

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?
   yes
2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   As per the information shared at CAG meetings, I feel *
3. What have been the effects of this Site on the surrounding community, if any?
   Some wells have been affected. The land of the site*
4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   Bears were living in abandoned small buildings and**
5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?
   yes at CAG meetings and a few letters to resident
6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?
   no
7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   Continue the good work to keep everyone as safe as possible — and prevent this type of pollution in U.S. and World in the future.

*at least the (first) half is no longer usable for any purpose except studing the effects of pollution and experimenting on ways to contain the pollution.

** foraging in the neighboring community. Once these buildings were destroyed, the number of bears in the neighboring community dropped drastically — basically none.

the work being done to stabalize and clean the site is good. I understand, however, that the site will be stabalized, hopefully contained, and, thus, never totally cleaned up and usable. the back half of the property that has no pollutants on it, is in process of being conserved. and, thus, always a wooded area with no buildings, or cleared for farming. I feel this is a good decision for this portion of the land. Trees are essential for a variety of reasons which are commonly known.

Chemtronics Superfund Site **Five-Year Review Interview Form**

Site Name: **Chemtronics** **EPA ID No.:**

Interviewer Name: _____ **Affiliation:** MOUNTAIN XPRESS NEWSPAPER

Subject Name: [redacted] **Affiliation:** _____

Subject Contact Information: COMMUNITY SURVEY

Time: 7:20 pm **Date:** 2/9/17

Interview Location: [redacted]

Interview Format (circle one): In Person Phone (Mail) Other:

Interview Category: Residents

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? YES
2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? SLOW BUT SURE, FROM WHAT I GATHER.
3. What have been the effects of this Site on the surrounding community, if any? SOME CONCERN. COMMUNITY SHOULD TAKE A MORE ACTIVE INTEREST IN THE SITE.
4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? N/A
5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? YES. EMAIL AND WEB UPDATES WOULD BE GOOD!
6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used? N/A
7. Do you have any comments, suggestions or recommendations regarding any aspects of the project? THANK YOU FOR THE FLOW OF INFORMATION. PLEASE KEEP ME IN THE LOOP!

- MHUNT@MOUNTAINX.COM
828-251-1333, EXT. 138

Chemtronics Superfund Site **Five-Year Review Interview Form**

Site Name: Chemtronics **EPA ID No.:**

Interviewer Name: _____ **Affiliation:** _____

Subject Name: _____ **Affiliation:** _____

Subject Contact Information: _____

Time: _____ **Date:** _____

Interview Location: _____

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:**

Interview Category: **Residents**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? yes
2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? a long project that has kept the risk inside the property.
3. What have been the effects of this Site on the surrounding community, if any? fear, uncertainty, a long blight on the valley.
4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? Not that I know of.
5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? Keep doing what they're doing.
6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used? No
7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

Keep it up.
The community cares, and is watching!

Site Name: Chemtronics, Inc. **EPA ID No.:** NCD095459392

Interviewer Name: _____ **Affiliation:** _____
Subject Name: _____ **Affiliation:** Swannanoa Superfund Community Advisory Group

Subject Contact Information: _____
Time: _____ **Date:** 5/16/2017
Interview Location: _____

Interview Format (underline one): **In Person** **Phone** **Mail** **Other: Email**

Interview Category: **Questions submitted to EPA by members of the Swannanoa Superfund Community Advisory Group**

1. Page 5 of the FYR (draft) indicates at the bottom paragraph that "the site is not currently in use and there are no current plans for reuse." My question is: at previous CAG meetings, the PRP's representatives have indicated they might want to do something with the land (i.e. sell timber), is that just speculation/hope instead of "a plan?"

   The Agency does not know if the conservation easement with the Southern Appalachian Highlands Conservancy will allow for light timbering. The Agency is not a participant in this agreement. The Agency does anticipate that the language in the forthcoming North Carolina's DPLUR (Declaration of Perpetual Land Use Restrictions) will include language that allows Chemtronics, Inc. to conduct some type of light timbering on the Superfund portion of their property.

2. At last week's CAG meeting, Jon, you offered speculation on why a contaminate was spreading when in previous years it was not. The speculation was that now that the pump and treat has been discontinued the contaminate is now in an anatomical condition and is moving with ground water. My question is: can pump and treat be resumed in that area?

   Instead of turning on the pump and treat system in the Back Valley which may have a negative impact on the ongoing pilot scale treatability study downgradient of the Acid Pit Area and Disposal Area 9, the PRPs are planning to implement another pilot scale treatability study in the vicinity of BW-14 to address this newly detected groundwater contamination. BW-14 is located approximately 500 feet from the property boundary. EPA and NCDEQ is currently reviewing the plans for implementing this pilot scale treatability study. The PRPs are hoping to begin work on this study in June/July of this year (2017).

APPENDIX J – EXAMPLE OF OFF-SITE RESTRICTIVE COVENANT

Workflow No. 0000384209-0001

Doc ID: 030871820007 Type: CRP
Recorded: 11/08/2016 at 04:09:12 PM
Fee Amt: $26.00 Page 1 of 7
Workflow# 0000384209-0001
Buncombe County, NC
Drew Reisinger Register of Deeds
BK 5488 PG 1832-1838

Prepared by and return to: Jillian W. Ballard of Roberts & Stevens, P.A., Post Office Box 7647, Asheville, NC 28802 (Box 39)

STATE OF NORTH CAROLINA

COUNTY OF BUNCOMBE

DECLARATION OF RESTRICTIVE COVENANTS

THIS DECLARATION OF RESTRICTIVE COVENANTS (hereinafter referred to as the "Declaration"), made this 2 day of August, 2016, by and between [redacted], ***unmarried*** *(hereinafter referred to as* [redacted] or "Owner"), and **CHEMTRONICS, INC., CNA HOLDINGS LLC,** and **NORTHOP GRUMMAN SYSTEMS CORPORATION** (hereinafter referred to as "Performing Parties"). The Owner and Performing Parties may collectively be referred to as the "Parties" or individually as a "Party".

WITNESSETH:

WHEREAS, Meador is the owner of that property described in a deed recorded in Book 3994 at Page 730, Buncombe County Registry, with Buncombe County Tax Identification Number 9679-87-9368-00000; and,

WHEREAS, Performing Parties are managing environmental response actions at that property described in a deed recorded in Book 1206 at Page 121, Buncombe County Registry, with Buncombe County Tax Identification Number 9780-04-5253-00000 which is in close proximity to the Property; and,

WHEREAS, Performing Parties have requested Owner restrict his property described above (hereinafter collectively the "Restricted Property"), prohibiting the use of groundwater located thereon, and Owner has agreed as set forth herein.

NOW, THEREFORE, Owner hereby declares that the Restricted Property, as defined above, shall be held, conveyed, encumbered, leased, rented, used, occupied and improved subject to the following restrictive covenant:

1. **Restriction on Groundwater**. Owner shall not use, extract, or otherwise access any groundwater located on the Restricted Property for any purpose. The Restricted Property is served by a water supply line running along Old Bee Tree Road, and therefore wells are not

2

required or permitted on the Restricted Property. Any existing wells shall be closed and prohibited from any further usage.

2. **Binding**. This Declaration is to be a covenant and restriction running with the Restricted Property and shall be binding upon Owner, his heirs, assigns, and successors in interest, and all parties, firms and corporations, claiming by, through or under him or otherwise acquiring any right, title or interest in and to the Restricted Property or any part or parts thereof.

3. **Waiver**. No provision contained in this Agreement shall be deemed to have been waived, abandoned, or abrogated by reason of failure to enforce them on the part of any person as to the same or similar future violations, no matter how often the failure to enforce is repeated.

4. **Amendment**. This Declaration may be modified or amended by a properly recorded and executed instrument signed by all the Parties hereto.

5. **Enforcement**. If Owner shall violate, or attempt to violate, any provision contained herein, it shall be lawful for any Performing Party to prosecute any proceeding at law or in equity against the person or persons violating or attempting to violate any such provision, and to either enjoin such breach and/or to recover damages for such violation, including all costs, expenses, and reasonable attorney's fees incurred in prosecuting said action.

6. **Severability**. Invalidation of any provision contained herein by judgment or Court order shall in no way affect any of the other provisions which shall remain in full force and effect.

IN WITNESS WHEREOF, the undersigned have executed this instrument as of the day and year first above written.

OWNER:

[redacted] (SEAL)

[redacted]

* *

3

STATE OF North Carolina
COUNTY OF Buncombe

I, Jillian Ballard, a Notary Public of the County and State aforesaid, certify that [redacted] personally appeared before me this day and acknowledged the execution of the foregoing instrument.

WITNESS my hand and official stamp or seal this 2nd day of August, 2016.

[SEAL]

JILLIAN W. BALLARD NOTARY PUBLIC BUNCOMBE COUNTY, N.C.

J. W. B

NOTARY PUBLIC

My Commission Expires:

May 5, 2019

CHEMTRONICS, INC.

By: _____

Print Name: Tim McKeon

Title: Director

RECEIVED
LEGAL
DATE 9/14

* *

STATE OF Texas
COUNTY OF Harris

I, Valorie Casey, a Notary Public of the County and State aforesaid, certify that Timothy McKeon, who is the Director of **Chemtronics, Inc., a North Carolina corporation,** personally appeared before me this day and acknowledged the execution of the foregoing instrument on behalf of the company.

WITNESS my hand and official stamp or seal this 13 day of September, 2016.

[SEAL]

VALORIE CASEY
Notary Public, State of Texas
My Commission Expires
October 16, 2018

_____
NOTARY PUBLIC

My Commission Expires:

10-16-18

R&S 1553074_1

5

CNA HOLDINGS LLC

By: _____

Print Name: James R. Peacock III

Title: Secretary

* *

STATE OF Texas
COUNTY OF Dallas

I, Kathleen C. Talley, a Notary Public of the County and State aforesaid, certify that James R. Peacock III, who is the Secretary of **CNA *Holdings* LLC**, personally appeared before me this day and acknowledged the execution of the foregoing instrument on behalf of the company.

WITNESS my hand and official stamp or seal this 24 day of October, 2016.

[SEAL]

KATHLEEN C. TALLEY
Notary ID #823497-5
Notary Public, State of Texas
My Commission Expires
May 30, 2018

My Commission Expires:

_____
NOTARY PUBLIC

R&S 1553074_1

6

NORTHOP GRUMMAN SYSTEMS CORPORATION

By: _____

Print Name: JOSEPH P. KWAN

Title: CORPORATE DIRECTOR, ENVIRONMENTAL REMEDIATION

* *

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public of the County and State aforesaid, certify that _____, who is the _____ of **Northrop Grumman Systems Corporation**, personally appeared before me this day and acknowledged the execution of the foregoing instrument on behalf of the company.

WITNESS my hand and official stamp or seal this _____day of _____, 2016.

[SEAL]

See attachment.
NOTARY PUBLIC

My Commission Expires:

_____

R&S 1553074_1

7

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Sacramento)

On October 24 2016 before me, Juan Mei Van, Notary Public
Date *Here Insert Name and Title of the Officer*

personally appeared Joseph P. Kwan
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

JUAN MEI VAN
Commission # 2030440
Notary Public - California
Sacramento County
My Comm. Expires Jun 22, 2017

Signature _____
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document
Title or Type of Document: Declaration of Restrictive Covenants
Document Date: August 2, 2016 Number of Pages: 10
Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name:	Signer's Name:
☐ Corporate Officer — Title(s):	☐ Corporate Officer — Title(s):
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other:	☐ Other:
Signer Is Representing:	Signer Is Representing:

APPENDIX K – DETAILED DATA REVIEW

This appendix supplements the data review found in Section IV of this FYR. Specific groundwater COCs are discussed in detail below. The COC-specific sections below discuss contamination in the Surficial Aquifer Zone and Transition Aquifer Zone; the Bedrock Aquifer Zone is discussed separately at the end of this appendix. The plume maps that accompany this data review section are from the Site's 2016 Annual Assessment Monitoring Report. The plume maps refer to the Surficial Aquifer System as Zone AB, to the Transition Aquifer System as Zone CD and to the Bedrock Aquifer System as Zone EF.

TCE

The highest TCE concentrations observed within the Surficial Aquifer Zone are present in the BV, downgradient of DA-9 and the APA, around wells MW-268 and MW-223 (Figure 19 in this appendix). The groundwater cleanup goal for TCE is 3 µg/L. In August 2015, MW-268 had a TCE concentration of 62,000 µg/L and MW-223 had a TCE concentration of 27,000 µg/L. In September 2016, MW-268 had a TCE concentration of 12,000 µg/L and MW-223 had a TCE concentration of 20,000 µg/L (Figure 19 in this appendix). TCE concentrations in that same area, within the deeper Transition Aquifer Zone are significantly lower. For example, in 2016, Transition Aquifer Zone well MW-256 had a TCE concentration of 4,500 µg/L (Figure 20 in this appendix).

PCE

Within the Surficial Aquifer Zone in the FV, the highest PCE concentrations are typically observed around well MW113-2, which had a PCE concentration of 80 µg/L in 2015. The well was not sampled in 2016. The PCE plume within the FV Transition Aquifer Zone has migrated farther downgradient (southeast) than the overlaying shallow plume (Figure 8 in this appendix). PCE is not considered an indicator COC for the BV.

Chloroform

Chloroform concentrations are highest within the Surficial Aquifer Zone in the BV. The highest chloroform concentrations are found around well M85L-9, immediately east of the APA and south of DA-6. The cleanup goal for chloroform is 70 µg/L. In September 2016, well M85L-9 had a chloroform concentration of 10,000 µg/L (Figure 23 in this appendix). Chloroform concentrations at that same area within the deeper Transition Aquifer Zone are significantly lower than concentrations in the overlaying Surficial Aquifer Zone. For example, in September 2016, Transition Aquifer Zone well MW-259 had a chloroform concentration of 1,000 µg/L (Figure 24 in this appendix).

Chloroform concentrations within the Surficial Aquifer Zone in the FV typically do not exceed the cleanup goal of 70 µg/L (Figure 10 in this appendix). Chloroform within the Transition Aquifer Zone exceeds the cleanup goal along a narrow area between wells MW-253 and MW-147. The highest chloroform concentration observed in April 2016 was 170 µg/L at well MW-253 (Figure 11 in this appendix).

1,2-DCA

1,2-DCA concentrations are highest within the Surficial Aquifer Zone in the BV, immediately east of the APA. The cleanup goal for 1,2-DCA is 0.4 µg/L. In August 2016, well M85L-9 showed a 1,2-DCA concentration of 20,000 µg/L (Figure 25 in this appendix). The 1,2-DCA plume in the underlying Transition Aquifer Zone occupies the same approximate footprint as the shallow plume, with concentrations relatively consistent with those found in the Surficial Aquifer Zone (Figure 26 in this appendix).

1,2-DCA concentrations within the FV are much lower than those observed in the BV. The highest 1,2-DCA concentrations are found within the Transition Aquifer Zone near well BW-4, south of DA-23. In August 2016, well BW-4 showed a 1,2-DCA concentration of 2,200 µg/L (Figure 13 in this appendix).

TBA

Significant concentrations of TBA are found in both the Surficial Aquifer Zone and Transition Aquifer Zone. The highest concentrations of TBA are found within the Transition Aquifer Zone in the BV, immediately downgradient of the APA (Figure 22 in this appendix). The TBA cleanup goal is 10 µg/L. In September 2016, Transition Aquifer Zone BV well MW-257 showed a TBA concentration of 310,000 µg/L. TBA concentrations at that same area within the Surficial Aquifer Zone are typically much lower than those observed in the Transition Zone Aquifer (Figure 21 in this appendix).

In August 2015, TBA concentrations at monitoring well MW172-T32D exceeded its cleanup goal of 10 µg/L, with a result of 11 µg/L. In September 2016, at that same well, routine groundwater analysis detected a concentration of TBA that exceeded the cleanup goal by more than 10 times (120 µg/L). The well is screened between 32 and 42 feet below ground surface and is located near the Site's eastern boundary at the BV (Figure 22 in this appendix). The well is located near the downgradient residential area. Response to the result included EPA notification, a mail-out survey to property owners within 1,500 feet to the east and south of the Site, sampling of eight off-site residential wells adjacent to the BV, and the addition of the well to an interim quarterly sampling schedule. The residential well sampling indicated that detected chemicals in these residential wells were below the North Carolina 2L groundwater standards. Anchor QEA sent letters to the owners of the eight private wells sampled, informing them of the results. Additionally, a pilot test has been planned for the area near well BW-14 (which is upgradient of well MW172-T32D) and further downgradient of the property boundary that will evaluate potential groundwater treatment options utilizing EISB. It is expected that the groundwater treatment will mitigate the potential for contaminant migration beyond the site boundary.

The off-site water well survey in 2010 and the above-mentioned off-site water well sampling activities in 2016 have found no COCs attributable to the Site in off-site groundwater at concentrations that exceed the 2L standard.

Typically, the TBA plume within the BV Transition Aquifer Zone is confined to the area immediately downgradient of the APA (Figure 22 in this appendix). The recent cleanup goal exceedances observed at the isolated location of MW172-T32D are not representative of typical site conditions. While the sampling performed in response to these atypical results confirmed that TBA concentrations in groundwater above the TBA cleanup goal are not present in the off-site residential wells, continued close monitoring of that location is warranted to make sure that the COC does not migrate beyond the site boundary at that location.

TBA is not considered an indicator COC for the FV.

RDX

The highest RDX concentrations are found within the Surficial Aquifer Zone in the BV, downgradient (southeast) of DA-9 (Figure 29 in this appendix). The RDX cleanup goal is 0.3 µg/L. In September 2016, well P-7D showed an RDX concentration of 82 µg/L. RDX concentrations at the same area, within the deeper Transition Aquifer Zone are much lower. For example, in September 2016, RDX was not detected at Transition Aquifer Zone well P-7B (Figure 30 in this appendix).

High RDX concentrations are also present within the Surficial Aquifer Zone in the FV, with the highest concentrations observed north of DA-23 (Figure 14 in this appendix). In 2012, well MW113-1 showed an RDX concentration of 120 µg/L. RDX concentrations within the underlying Transition Aquifer Zone in the FV are much lower than those found in the Surficial Aquifer Zone. For example, in 2016, the highest RDX concentration observed within the Transition Aquifer Zone in the FV was 28 µg/L at well DW151-2 (Figure 15 in this appendix).

However, RDX within the FV Transition Aquifer Zone extends in a long narrow pathway toward the Site's southeastern boundary to well MW154-O44C. In August 2015, RDX concentrations at that location slightly exceeded the cleanup level with a result of 0.5 µg/L. In September 2016, RDX was not detected at well MW154-O44C with a reported detection limit of 0.7 µg/L. However, that result does not confirm whether the COC was present at or slightly above the cleanup level of 0.3 µg/L (Figure 15 in this appendix). In spring of 2017, MW154-O44C showed an estimated RDX concentration of 0.23 µg/L, which is below the cleanup level.[4] The most recent data show that RDX contamination appears to be confined within the site boundary. However, continued close monitoring of RDX concentrations at that location is warranted. RDX was not detected in spring 2017 at five wells located near well MW154-O44C (BW-13, MW158-N44A, MW167-O44A, MW156-P44A, and MW155-P43C). The off-site property immediately south of well MW154-O44C, at 111 Old Bee Tree Road, is an industrial property. According to the City of Asheville's Water Resources Department, the property is connected to the public water supply.

Perchlorate

The highest perchlorate concentrations are found within both the Surficial and Transition Aquifer Zones in the BV, immediately downgradient (southeast) of the APA and DA-9 (Figures 31 and 32 in this appendix). The cleanup goal for perchlorate is 2 µg/L. In September 2016, Surficial Aquifer Zone BV well P-7D showed a perchlorate concentration of 6,200 µg/L, and Transition Aquifer Zone BV well MW-265 showed a perchlorate concentration of 6,700 µg/L.

Perchlorate concentrations in the FV routinely exceed the cleanup goal, but are significantly lower than concentrations found in the BV. For example, in 2016, the highest perchlorate concentration observed within the Surficial Aquifer Zone in the FV was 240 µg/L at well IW151-2 (Figure 16 in this appendix).

Bedrock Aquifer Zone

The extent of groundwater contamination within the Bedrock Aquifer Zone covers a much smaller area than what is observed in the shallower, overlaying aquifers. While COCs within the Bedrock Aquifer Zone exceed cleanup levels, in general, COC concentrations are much lower within the Bedrock Aquifer Zone than in the shallower aquifer zones (Figures 18 and 33 in this appendix). The highest VOC concentrations within the Bedrock Aquifer Zone are observed south of the BV DAs, around wells MW269-M26EF, MW272-M27EF, MW272-M27F, MW273-O26EF, and MW273-O26F (Figure 33 in this appendix). For example, in 2016, BV Bedrock Aquifer Zone well MW272-M27F showed a 1,2-DCA result of 4,000 µg/L and a TBA result of 46,000 µg/L. VOCs also exceed cleanup levels in the FV within the Bedrock Aquifer Zone, but at typically lower concentrations than those found in the BV.

According to Figure 30, included in the 2015 Annual Assessment Monitoring Report, between 2007 and 2015, exceedances of the perchlorate and RDX cleanup levels within the Bedrock Aquifer Zone have been observed at FV wells MW252-J39EF, MW251-K39EF and MW176-L41E and BV well BW-11. In

[4] Spring 2017 sampling results for well MW-154-O44C and the five surrounding wells were provided by Anchor QEA for inclusion in this FYR; they were not submitted as part of an Annual Assessment Monitoring Report.

2016, 1,2-DCA concentrations at wells BW-5 (2,900 µg/L) and MW-1BD (4.8 µg/L) exceeded the 1,2-DCA cleanup level of 0.4 µg/L. Those two wells are located between DA-23 and DA-10/11. Also in 2016, TCE (7.5 µg/L) and PCE (2.4 µg/L) concentrations at well MW229-L41EF exceeded their respective cleanup levels of 3 µg/L and 0.7 µg/L (Figure 18 in this appendix).