AMENDMENT TO THE OPERABLE UNIT TWO RECORD OF DECISION FOR THE OLEAN WELL FIELD SUPERFUND SITE RELATED TO THE AVX PROPERTY

City of Olean, Cattaraugus County, New York

United States Environmental Protection Agency
Region 2
New York, New York
September 2015

DECLARATION FOR AMENDMENT TO OPERABLE UNIT TWO RECORD OF DECISION

SITE NAME AND LOCATION

Olean Well Field Superfund Site
City of Olean, Cattaraugus County, New York

Superfund Site Identification Number: NYD980528657
Operable Unit 02

STATEMENT OF BASIS AND PURPOSE

This decision document comprises an amendment to the September 1996 operable unit two Record of Decision (OU2 ROD) for the area identified herein as the AVX Property at the Olean Well Field Superfund site (Site). By this document, the U.S. Environmental Protection Agency (EPA) selects a modified interim remedy to contain soil and groundwater contamination at the AVX Property. This remedy is being chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. Sections 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the amended OU2 remedy for the AVX Property. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the amended OU2 remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the proposed amended remedy in accordance with CERCLA Section 121(f), 42 U.S.C. Section 9621(f), and it concurs with the amended remedy (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response actions selected in this OU2 ROD Amendment, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response actions in this OU2 ROD Amendment actively address soil and groundwater contamination at the AVX Property. For purposes of this OU2 ROD Amendment, the AVX Property includes the 18.5 acres of real property owned by the AVX Corporation, a portion of which is used to conduct electronic component manufacturing, which is located at 1695 Seneca Avenue, Olean, New York.

The major components of the amended remedy for the AVX Property include the following:

- Historical Source Area[1] (Soil and Till Unit Groundwater): Maintenance of an exposure barrier utilizing existing surface covers (the building and paved areas in the northern portion of

[1] For purposes of this OU2 ROD Amendment and the February 4, 2015, FS Report for the AVX Property, the Historical

the Historical Source Area and the vegetative cover in the drainage swale area) to minimize leaching of volatile organic compounds (VOCs) from soil to groundwater and serve as a direct contact exposure barrier.

• Downgradient Till Unit (Groundwater): Construction and operation of a hydraulic trench containment system involving a gravel trench coupled with active groundwater recovery and treatment to prevent migration of groundwater downgradient of the AVX Property.

• City Aquifer (Groundwater): Hydraulic pumping containment utilizing and maintaining an existing AVX Property production well (PW-1) as an active groundwater recovery system at a pumping rate that prevents further migration of contaminated groundwater within the City Aquifer. An air stripper or carbon adsorption system or combination thereof will be added to the extraction system, as necessary to meet surface water discharge requirements.

• Implementation of institutional controls, including soil and groundwater use restrictions, to ensure the remedy remains protective.

• Development of a Site Management Plan (SMP) to provide for the proper management of the interim remedy post-construction, and to include long-term groundwater monitoring, periodic reviews and certifications. Until a final remedy is selected, the SMP will provide for the proper management of any contaminated unsaturated soil at the AVX Property and the evaluation of the potential for vapor intrusion at the existing building on the AVX Property and/or for any buildings constructed in the future, and mitigation, if necessary, in compliance with the SMP. The SMP will also provide for the proper implementation, management and maintenance of institutional controls. A change in the current use of the building in the future will trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy.

• Implementation of a long-term groundwater monitoring program as part of the SMP to verify the effectiveness of the interim remedy, and to track and monitor changes in the groundwater contamination over time at the AVX Property. The long-term groundwater monitoring program will consist of a comprehensive monitoring network made up of existing monitoring wells and additional monitoring wells and piezometers on and off the AVX Property, within not only the City Aquifer but also within the till unit, and also monitoring to further evaluate geochemical conditions.

DECLARATION OF STATUTORY DETERMINATIONS

The selected amended remedy satisfies the statutory requirements of CERCLA § 121(b), 42 U.S.C. § 9621(b), as follows: This interim action is protective of human health and the environment in the short term and is intended to provide adequate protection until a final remedy for the AVX Property is implemented; complies with those federal and state requirements that are applicable or relevant and appropriate for this limited-scope action; and is cost-effective. Although this interim action is not intended to fully address the statutory mandate for permanence and treatment to the

Source Area generally consists of soil contamination and groundwater contamination in the Till Unit beneath the manufacturing building and the land at the southeast corner of the building immediately proximate thereto, including the shallow north-south trending drainage swale that begins to the south of the building.

maximum extent practicable, this interim action does utilize treatment and thus supports that statutory mandate. Because this action does not constitute the final remedy for the AVX Property, the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be addressed by the final response action. Subsequent actions will fully address the threats posed by conditions at the AVX Property at the Site.

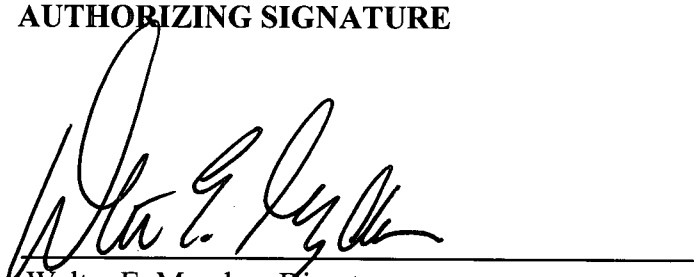
The selected interim remedy will result in hazardous substances, pollutants, or contaminants at levels that will not allow for unrestricted use and unlimited exposure until performance standards are attained, and as such, use and exposure must be limited until standards are met. Statutory reviews, pursuant to Section 121(c) of CERCLA, will be conducted no less often than once every five years after the start of construction to ensure that the remedy is, or will be, protective of human health and environment. Because the selected remedy is an interim action, review of this remedy and the Site will be ongoing until the EPA develops the final remedy for the AVX Property.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this OU2 ROD Amendment. Additional information can be found in the Administrative Record for this Site.

- A discussion of the current nature and extent of soil and groundwater contamination is included in Section 5;
- Chemicals of concern and their respective concentrations may be found in Section 7 "Summary of Site Risks" and Table 1 in Appendix II;
- Potential adverse effects associated with exposure to Site contaminants may be found in Section 7, "Summary of Site Risks;"
- A discussion of remediation goals for chemicals of concern may be found in Section 8 "Remedial Action Objectives" and in Table 6 in Appendix II;
- Current and reasonably-anticipated future land use assumptions are discussed in Section 6 "Current and Potential Future Land and Resource Uses;"
- Estimated capital, annual operation and maintenance, and total present-worth costs are discussed in Section 9 "Summary of Remedial Alternatives;" and
- Key Factors in the detailed analyses of remedial alternatives (*e.g.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria) may be found in Section 10 "Comparative Analysis of Alternatives" and Section 13 "Statutory Determinations."

AUTHORIZING SIGNATURE



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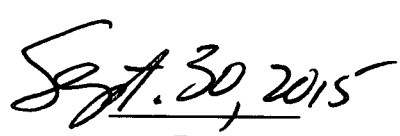

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DECISION SUMMARY

1. SITE NAME, LOCATION, AND DESCRIPTION

The Olean Well Field Superfund site (Site) is located in the eastern portion of the City of Olean and western and northwestern portions of the towns of Olean and Portville in Cattaraugus County, New York. The Site is characterized by contaminated groundwater encompassing an area approximately 800 acres underlying the City of Olean, the Town of Olean, and the Town of Portville, and by contaminated soil at certain locations in the City and Town of Olean. The Site is approximately 65 miles southeast of Buffalo, New York, and seven miles north of the New York/Pennsylvania border. The Allegheny River, a principal tributary of the Ohio River, and two of its tributaries, the Olean and Haskell Creeks, flow west-northwest through the southern portion of the Site. A Site location map is provided as **Figure 1** in **Appendix I**.

EPA has divided the Site into separate phases, or operable units, for remediation purposes. Operable Unit 1 (OU1) addresses the drinking water supply for the City and Town of Olean. OU2 addresses the sources of volatile organic compound (VOC) contamination to groundwater. Investigations conducted to date identified four source areas of VOC contamination to groundwater at the Site: Alcas Cutlery Corporation (Alcas) (currently owned and operated by Cutco Corporation and located at 1116 East State Street, Olean, New York); Loohn's Dry Cleaners and Launderers (Loohn's) (currently a vacant lot located at 1713 East State Street, Olean, New York); McGraw-Edison Company (McGraw) (currently operated by Cooper Power Systems, LLC, owned by Cooper Power Systems, Inc., and located at 1648 Dugan Road, Olean, New York); and AVX Corporation (AVX) (currently owned by AVX and located at 1695 Seneca Avenue, Olean, New York). OU3 addresses groundwater contamination relating to the Alcas source area that migrated beyond the Alcas facility to Parcel B, which is located south of the Alcas facility. OU4 addresses VOC contamination in groundwater located downgradient of the AVX Property and south of the Conrail railroad tracks; the EPA is presently conducting a remedial investigation and feasibility study (RI/FS) for OU4. The AVX Property includes the 18.5 acres of real property owned by the AVX Corporation, a portion of which is used to conduct electronic component manufacturing.

This Record of Decision (ROD) Amendment for OU2 (OU2 ROD Amendment) addresses soil and groundwater contamination at the AVX Property. A map of the AVX Property is provided as **Figure 2** in **Appendix I**.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

Three municipal water supply wells (18M, 37M and 38M) at the Site (see **Figure 1**) were constructed and completed in the late 1970s to provide water for the City and the Town of Olean, New York. The supply wells draw water from the City Aquifer. Prior to the construction of these municipal wells, city water was supplied by a surface-water treatment facility which drew water from the Olean Creek. In 1981, these supply wells were found to contain trichloroethene (TCE) and other VOCs at concentrations exceeding federal maximum contaminant levels (MCLs) and drinking water standards set by the New York State Department of Health (NYSDOH). As a result, these wells were closed and the surface water treatment facility operations were reactivated

to provide water to residents.

EPA subsequently evaluated the Site for inclusion on the National Priorities List (NPL) of known or threatened releases of hazardous substances. As a result of this evaluation, the Site was included on the National Interim Priorities List, by publication in the Federal Register on October 23, 1981, and was included on the first NPL on September 9, 1983.

Between 1981 and 1985, several separate federal-, state- and potentially responsible party (PRP) - led investigations were conducted to identify the sources of contamination to the municipal wells and evaluate the nature and extent of groundwater contamination at the Site.

Following the discovery by the Cattaraugus County Department of Health and the NYSDOH that a number of private wells in the City and Town of Olean, all of which received groundwater from the upper aquifer overlying the till unit, were also contaminated with TCE, the EPA performed an initial removal action[1] in January 1982. This action involved the installation of carbon adsorption filters on 16 contaminated private wells and periodic monitoring of those wells. In June 1984, the EPA conducted a second removal action which included the replacement of one of the carbon filters installed as part of the initial removal action, installation of carbon units on ten additional contaminated private wells, and monitoring. In March 1985, the EPA conducted a third removal action which consisted of the installation of carbon filter systems on two additional homes.

The results of the various investigations were documented in the ROD for OU1 issued by the EPA on September 24, 1985. The ROD for OU1 called for the following: 1) installation of an air stripper to treat the contaminated groundwater from municipal water supply wells 18M, 37M and 38M; 2) extension of the City of Olean's public water supply line into the Town of Olean to connect approximately 93 residences served by private wells; 3) inspection of an industrial sewer; 4) recommendations for institutional controls to restrict the withdrawal of contaminated groundwater; 5) institution of a Site Monitoring Plan; and 6) performance of a supplemental RI/FS to evaluate source control measures at all facilities that were contributing to the groundwater contamination.

On February 7, 1986, the EPA issued an administrative order unilaterally under Section 106(a) of CERCLA, 42 U.S.C. §9606, (OU1 UAO) to AVX, McGraw-Edison Company, Cooper Industries, Inc. (parent corporation of McGraw-Edison Company), Alcas, Aluminum Company of America (which at the time owned a percentage share of Alcas and has since changed its name to Alcoa Inc.), and W.R. Case and Sons Cutlery Company (Case) (which at the time owned the remaining percentage share of Alcas), requiring them to implement the remedy selected in the OU1 ROD.

All of the PRPs, with the exception of Case, performed the actions pursuant to the OU1 UAO. Case subsequently filed for bankruptcy. The trustee in that bankruptcy entered into a consent decree with the United States which required the bankruptcy estate to pay a portion of the EPA's past costs and a penalty for Case's failure to comply with the OU1 UAO.

Pursuant to the OU1 UAO, the extension of the City of Olean's water line was completed in 1988. In 1989, the private well users were connected to the water line extension. Although residents

[1] Removal actions are often used to take early action in response to releases or threats of releases of hazardous substances.

impacted by the Site were offered connection to the public water supply pursuant to the OU1 ROD, to date, some residents continue to use private wells as a source of potable water. Also in 1989, the industrial sewer at the McGraw property was inspected and repaired. In February 1990, construction of the air strippers was completed and the municipal well water supply service was reactivated. The current total pumping rate for the municipal wells is approximately 3 million gallons per day. Since the air strippers began operating, sampling indicates that the system effectively removes Site contaminants from the groundwater pumped from the City Aquifer to meet State and Federal drinking water standards prior to distribution to the public.

On November 13, 1989, the EPA issued an additional administrative order to Alcas. The order required Alcas to excavate approximately 10 cubic yards of contaminated soil from an area at the Alcas property where TCE had previously been used as a weed killer. This work was completed in 1989.

On June 25, 1991, an administrative order on consent was entered into between the EPA and AVX, McGraw-Edison, Cooper Industries, Alcas, and Alcoa, Inc. for performance of a supplemental RI/FS. The supplemental RI/FS was a mixed work project. Pursuant to this administrative order, the PRPs were required to investigate their respective properties. In addition, the EPA conducted studies on 10 additional properties. The results from the investigations conducted by the EPA were provided to the PRPs for incorporation into the supplemental RI/FS. In addition to the AVX, Alcas and McGraw-Edison properties, the supplemental RI/FS identified the Loohn's property as an additional source area.

Based on the results of the supplemental RI/FS, the EPA issued a ROD for OU2 on September 30, 1996. The major components of the selected remedy for the AVX Property included the following:

- Excavation and removal of contaminated soil;
- Off-Site low temperature desorption of soil contaminants, if necessary;
- Upgradient and downgradient groundwater monitoring;
- Implementation of groundwater treatment, if excavation and removal of the contaminated soil did not adequately improve the quality of the City Aquifer and if the property continued to affect the groundwater entering the municipal wells; and
- Implementation of groundwater use restrictions.

The major components of the selected remedy for OU2 for the Alcas property included the following:

- Vacuum-Enhanced Recovery (VER) of VOCs from contaminated soil;
- Upgradient and downgradient groundwater monitoring; and
- Implementation of groundwater use restrictions.

The major components of the selected remedy for the Loohn's property included the following:

- VER or Soil Vapor Extraction with Air Sparging (SVE/AS). If design studies indicated VER and SVE/AS were impracticable due to the influence of the Allegheny River, the source area would be excavated;
- Upgradient and downgradient groundwater monitoring;
- Implementation of groundwater treatment if VER and SVE/AS or excavation do not adequately improve the quality of the City Aquifer, and if the Loohn's property continued to affect the groundwater entering the municipal wells; and
- Implementation of groundwater use restrictions.

The major components of the selected remedy for the McGraw property included the following:

- Groundwater treatment;
- Upgradient and downgradient groundwater monitoring; and
- Implementation of groundwater use restrictions.

Implementation of the OU2 ROD

On March 17, 1998, three consent decrees were entered by the United States District Court for the Western District of New York. Each Consent Decree required either McGraw-Edison and Cooper Industries, Alcas and Alcoa, or AVX to perform the remedial design and remedial actions for their respective properties as specified in the OU2 ROD. The remedial action for the Loohn's property was performed by the EPA.

McGraw-Edison - Cooper Industries:

Construction of a groundwater pump and treatment system for the contaminated upper groundwater aquifer at the McGraw-Edison property was initiated in 1999. In July 2001, operation of the groundwater treatment system commenced. The treatment system consists of two extraction wells with an average combined pumping rate of 20 gallons per minute (gpm) from the impacted upper groundwater bearing zone, a shallow tray air-stripper to remove VOCs from the extracted groundwater and a reinjection well to return treated water to the City Aquifer.

Loohn's Dry Cleaners and Launderers:

In the absence of a viable PRP, the EPA funded the implementation of the components of the selected remedy at the Loohn's property. A remedial design study was completed in 1998 by the EPA and based on this study, the EPA elected to implement the soil excavation option of the selected OU2 remedy in lieu of VER or SVE/AS.

In 2000, the EPA initiated the soil excavation activities and approximately 3,000 cubic yards of soil contaminated with tetrachloroethylene (PCE) and other VOCs were excavated and disposed of off Site. After soil excavation activities commenced, additional data collected at the property revealed that the quantity of soil requiring excavation significantly exceeded the estimated design quantity. As a result, an additional 4,000 cubic yards of contaminated soil, was excavated and, along with the debris from the demolished remains of an old building on the property, disposed of off Site.

Sampling of the groundwater monitoring wells at the Loohn's property have continued to reveal elevated concentrations of VOCs in groundwater. During the most recent sampling conducted in April 2015, TCE and PCE were detected at concentrations of 96 micrograms per liter (µg/L) and 960 µg/L, respectively. The EPA is in the process of determining the scope of further investigations at the Loohn's property.

Alcas:

In 1999, the PRPs associated with the Alcas property initiated a series of property-specific pre-design investigations that involved further characterization studies necessary to design the VER component of the selected remedy. Based upon the initial results of these studies, the PRPs determined that geological conditions in the till unitare heterogeneous and also that the source of groundwater contamination was not from the shallow soil at the rear of the property as identified in the OU2 ROD, but rather the data suggested that the main source of contamination was beneath the main manufacturing building. Based on this new information, Alcas conducted further investigations in 2001 to support its belief that a residual dense non-aqueous phase liquid (DNAPL[2]) source is located at the property under the main manufacturing building.

On September 30, 2014, the EPA issued a decision document containing an OU2 ROD Amendment and OU3 ROD the major components of which call for *in-situ* chemical oxidation (ISCO) using persulfate and excavation of certain contaminated soil at the Alcas property and enhanced *in-situ* anaerobic bioremediation (EAB) at Parcel B, respectively. The EPA expects remedial design activities for the implementation of these remedies will begin in 2016.

AVX:

In 1996, during excavation activities related to the expansion of the AVX manufacturing building, a solvent underground storage tank (UST), which was supposed to have been properly closed and filled with cement, was discovered to contain liquid. The UST was excavated and removed by AVX Corporation in 1999 prior to construction and expansion of the receiving/storage area portion of the manufacturing building. AVX initiated the excavation of contaminated soil pursuant to the 1996 ROD at its property in July 2000. Approximately 5,055 tons of contaminated soil was excavated to a depth of approximately 10 feet below grade surface and transported off Site for disposal before work was halted. AVX could not excavate all of the contaminated soil because the material extended beyond the area identified as contaminated in the OU2 ROD to beneath the southeast corner of the manufacturing building, which was fully occupied with AVX's manufacturing operations. Further excavation had the potential to impact the structural integrity of the occupied building. As a result, the excavation area was backfilled pending further study. Further evaluations, discussed below, revealed significant unknown contamination extending under the building and that additional excavation and removal of all contaminated soil would result in significant disruption to and/or shutdown of the on-going operations.

[2] A dense non-aqueous phase liquid or DNAPL is a liquid that is both denser than water and is immiscible or has low solubility in water.

3. COMMUNITY PARTICIPATION

On June 15, 2015, the EPA released the Proposed Plan for the modified remedy for the AVX Property to the public for comment. The EPA assembled supporting documentation, which comprises the administrative record, and has made it available to the public at the information repositories maintained at the Olean Public Library located at Second and Laurens Streets, Olean, New York, and the EPA Region 2 Office in New York City.

Notice of the June 15, 2015 start of the public comment period and the availability of the above-referenced documents was published in *The Olean Times Herald* on June 15, 2015. A copy of the public notice published in *The Olean Times Herald* can be found in **Appendix V**. The EPA accepted public comments on the Proposed Plan from June 15, 2015 through July 15, 2015.

On June 23, 2015, the EPA held a public meeting at the Jamestown Community College, Cattaraugus County Campus, in the Cutco Theatre, located at 260 North Union Street, Olean, New York, to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for the AVX Property, including the preferred proposed remedial alternatives, and to respond to questions and comments from the attendees. Responses to comments received at the public meeting and in writing during the public comment period are included in the Responsiveness Summary (See **Appendix V**). No comments received during the comment period expressed disagreement with the EPA's preferred alternatives.

4. SCOPE AND ROLE OF RESPONSE ACTION AT AVX PROPERTY

This OU2 ROD Amendment addresses the remediation of the AVX Property at the Site, encompassing soil and groundwater contamination impacting the underlying aquifers at the AVX Property. Section 300.5 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Section 300.5, defines an OU as a discrete action that comprises an incremental step toward comprehensively addressing a site's problems. A discrete portion of a remedial response eliminates or mitigates a release, a threat of release, or pathway of exposure. Cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with the site. The EPA also uses interim actions to address areas or contaminated media, such as soil or groundwater, that ultimately may be included in the final record of decision for a site. Interim actions are used, for example, to institute temporary measures to stabilize a site or operable unit and/or prevent further migration of contaminants or further environmental degradation until such time as a final remedial decision is made.

The EPA has designated four OUs for the Olean Well Field site. OU1 addresses the drinking water supply for the City and Town of Olean and the extension of the public water supply to residents utilizing private wells. OU2 addresses the sources of VOC contamination to groundwater, specifically: Alcas, Loohn's, McGraw and AVX. OU3 addresses groundwater contamination at Parcel B located south of the Alcas facility. OU4 addresses VOC contamination in groundwater located downgradient of the AVX Property and south of the Conrail rail road tracks.

The 1996 OU2 ROD noted that the contaminated soil at the AVX source area would be excavated and treated via thermal desorption if necessary. The ROD also required the implementation of

groundwater treatment, if excavation and removal of the contaminated soil did not adequately improve the quality of the City Aquifer and if the AVX Property continued to affect the groundwater entering the municipal wells. This ROD Amendment eliminates, in the interim, this groundwater treatment system.

Additional multi-phase investigations performed by AVX, after the issuance of the OU2 ROD, and after the soil excavation was halted, revealed significant, additional soil and groundwater contamination, as well as additional hydrogeologic information, which showed that the 1996 OU2 selected remedy for the AVX Property is not protective of human health and the environment because contaminated soil at elevated concentrations extended further beneath the manufacturing building than was known at the time of the OU2 ROD. The contaminated soil acts as a continuing source of groundwater contamination that could migrate. The extent of the contamination revealed by the multi-phase investigation was not known at the time the OU2 ROD was issued. In addition, the removal of the contaminated soil that was performed did not adequately improve the quality of the City Aquifer. As a result, modification to the AVX Property component of the OU2 ROD is necessary.

The selected remedy in this OU2 ROD Amendment is an interim action. The primary objectives of this interim action are to minimize, contain and/or eliminate the migration of contaminants in soil and groundwater at the AVX Property and to minimize any potential future health and environmental impacts from the AVX Property until such time as a final remedy is implemented. This interim remedy will be consistent with, and will not preclude, implementation of a final remedy at the AVX Property. Currently, groundwater restoration is one of the EPA's goals for the Site. This OU2 interim amended remedy will neither be inconsistent with, nor preclude, implementation of a final remedy for the AVX Property.

5. SUMMARY OF AVX PROPERTY CHARACTERISTICS

5.1 Site Geology/Hydrogeology

The Olean Well Field is underlain by approximately 300 feet of unconsolidated glacial deposits. Previous groundwater investigations in the Olean Well Field have shown that the upper 100 feet of glacial deposits can be divided into five lithologic units based on color, texture, grain size and mode of deposition. These lithologic units have been grouped in topographically descending order into four hydrogeologic units referred to as the upper aquifer, upper aquitard, lower aquifer, and lower aquitard.

The upper aquifer is comprised of glaciofluvial coarse sands and sandy gravels, recent fluvial deposits of fine sands, and silts with some clay. The upper aquifer is not continuous at the Olean Well Field Site. The thickest portion of the upper aquifer (approximately 41 feet) is found along the Allegheny River. The upper aquifer thins to the north, pinching out just south of the AVX Property. The upper aquifer is recharged by the infiltration of precipitation. Groundwater in the upper aquifer is generally encountered at a depth of approximately 12 to 15 feet below land surface and flow is toward the Allegheny River.

The upper aquitard, referred to as the till unit, is located above the lower aquifer. This unit is a low-permeability lodgement till composed of greater than 50 percent silt and clay. This unit is

heterogeneous and can contain some sandier layers that generally have limited lateral extents. The thickness of the upper aquitard at the Olean Well Field Site ranges from as little as six feet in the south to over 30 feet in the north, near the AVX Property. In the northern portion of the Site this unit is present at the surface and consists of surficial till. For the purposes of evaluating remedial alternatives, the till unit at the AVX Property is being addressed in two areas; the Historical Source Area[3] and the Downgradient Till Unit (located downgradient of the Historical Source Area).

The lower aquifer, also referred to as the City Aquifer, consists of glacial outwash deposits of sand, silt, and gravel. The thickness of the lower aquifer is approximately 70 feet in the northern portion of the Site and thins to approximately 30 feet south of the Allegheny River to the south. The lower aquifer is the main source of drinking water for the City and Town of Olean. In addition, several industrial facilities in the area utilize wells completed in the lower aquifer for manufacturing activities. The regional groundwater flow within the City Aquifer near the AVX property is generally in a west-southwest direction.

Recharge to the lower aquifer (City Aquifer) at the Olean Well Field site is via leakage from the upper aquifer through the upper aquitard (till unit) or directly through the till unit where the upper aquifer is not present. The magnitude of this leakage is variable over the Olean Well Field site and is dependent on the thickness and permeability of the till (upper aquitard) and relative groundwater level differences between the upper aquifer (or till) and lower aquifer.

Underlying the City Aquifer, the lower aquitard has been described as silt, clay, and fine to very fine sand deposited in a pre-glacial environment.

Groundwater level data and potentiometric surface maps indicate that lines of equal elevation for the upper aquifer generally parallel the Allegheny River. This indicates that groundwater flow is towards the river from both sides of the river valley. Natural flow conditions in the lower or City Aquifer within the vicinity of the Site have been altered by the pumping of the municipal wells, in operation since 1985, and an AVX production well, in operation since 1959.

5.2 Unknown Conditions or Information Related to AVX Property

Following the backfilling of the excavated soil at the AVX Property, the EPA directed AVX to conduct soil and groundwater sampling activities at the AVX Property and properties to the south as part of a multi-phase investigation to assess the conditions at these properties. Results from these studies indicate that significant, previously unknown VOC contamination is present in both soil and groundwater 1) beneath the southeastern portion of the AVX manufacturing building; 2) in the undeveloped wooded area of the AVX Property to the south of the manufacturing building which includes the north-south trending drainage swale that begins to the south of the building; and 3) beyond the southern AVX Property boundary downgradient of the manufacturing building (i.e., south of the Conrail rail road tracks). The extent of this contamination in these three areas

[3] For purposes of this OU2 ROD Amendment and the February 4, 2015 FS Report for the AVX Property, the Historical Source Area generally consists of soil contamination and groundwater contamination in the Till Unit beneath the manufacturing building and the land at the southeast corner of the building immediately proximate thereto, including the shallow north-south trending drainage swale that begins to the south of the building.

was not known at the time the OU2 ROD was issued, nor anticipated based on the remedial investigation conducted to support the 1996 OU2 ROD. The EPA has designated the previously unknown contamination area south of the AVX Property (number 3 above) as OU4 and is presently conducting the OU4 RI/FS.

5.3 Soil and Groundwater Investigation Summary

Results of multiple (post-OU2 ROD) investigations, which included direct-push sampling, installation and sampling of monitoring wells, and direct-sensing technologies (e.g., membrane interface probes), have demonstrated that groundwater in the till unit is contaminated with VOCs beneath the AVX manufacturing building and in the undeveloped area between the building and the southern property boundary. Investigation results also show that the City Aquifer has been affected, but at much lower concentrations than in the shallow (till) stratigraphic unit.

VOC contamination in soil and groundwater consists primarily of TCE, 1,1,1-trichlorethane (1,1,1-TCA), PCE, and the breakdown products *cis*-1,2-dichloroethene (*cis*-1,2-DCE), vinyl chloride, 1,1-dichloroethane (1,1-DCA), with elevated concentrations of other VOCs, including 1,2-dichloroethane (1,2-DCA), toluene, xylenes, chloroethane, and acetone.

As set forth in the January 29, 2013 Feasibility Study Investigation (FSI) Report, high concentrations of VOCs have been observed in soil (up to 1,614 milligrams/kilogram (mg/kg) of total VOCs) and groundwater (up to 325,000 µg/L of total VOCs) beneath the southeast corner of the manufacturing building by a maintenance shop and a former solvent underground storage tank (both along the eastern edge of the manufacturing building), and in areas immediately to the south and north of the manufacturing building. Minimal detections of VOC contamination were detected in soil south of the fenced area (i.e., chain link fenced area in **Figure 2**)) of the AVX Property. High concentrations of VOCs have also been observed in groundwater (up to 379,987 µg/L of total VOCs) in the drainage swale area. Sampling data indicates that a significant amount of VOC contamination in groundwater has migrated downgradient from the Historical Source Area within the swale to the southern undeveloped area of the AVX Property.

A groundwater plume of VOC contamination in the till unit originates from the Historical Source Area and extends through the undeveloped area to at least the southern property boundary. Total VOC concentrations in the most highly contaminated parts of the plume commonly range between 10,000 to 50,000 µg/L. Overall groundwater flow in the silt-dominated till unit is slow. However, flow is faster in sand beds within the till unit. Although the sandier layers have limited lateral extents, they serve as preferred pathways for horizontal contaminated groundwater migration.

Groundwater sampled from monitoring well AVX-17S, installed after the OU2 ROD was issued, which is located about 100 feet north of the southern boundary of the AVX Property, contained relatively elevated concentrations of VOCs (33,000 µg/L in 2005), which led to several additional phases of investigation to delineate the extent of VOCs in the area south of the AVX Property. Groundwater in well AVX-19S, also installed after the OU2 ROD was issued and located at the southern boundary of the AVX Property, contains significantly elevated levels of TCE and 1,1,1-TCA, as well as daughter/breakdown products, *cis*-1,2-DCE and 1,1-DCA.

Some natural attenuation of chlorinated organics through biodegradation is occurring in

groundwater within the till unit, as demonstrated by observed geochemical conditions, generally decreasing concentrations of parent VOCs (TCE, PCE, 1,1,1-TCA), and increasing concentrations of their daughter products (*cis*-1,2-DCE, vinyl chloride, 1,1-DCA). However, based on the data collected to date, the biodegradation process is not considered complete nor consistent throughout the area.

Although the till unit has very low vertical permeability, some VOC contamination has moved vertically downward into the City Aquifer, most notably in wells AVX-4D (939 µg/L total VOCs in 2005) and AVX-19D (346 µg/L total VOCs in 2012). Concentrations of chlorinated VOCs in the City Aquifer beneath the manufacturing building are commonly several orders of magnitude lower than what is detected in groundwater within the overlying till unit. AVX has operated a production well (PW-1) at the AVX Property that is screened in the City Aquifer and has used groundwater as noncontact cooling water in its manufacturing processes for the past 55 years.

5.4 Vapor Intrusion Investigation Summary (Entire Site)

VOC vapors released from contaminated groundwater and/or soil have the potential to move through the soil and seep through cracks in basements, foundations, sewer lines and other openings. The EPA investigates the soil vapor intrusion pathway at homes and buildings situated at Superfund sites when the potential for vapor intrusion exists. While not directly related to the actions investigated as part of this ROD Amendment, the EPA is taking this opportunity to update the public on the status of vapor intrusion investigations performed at the entire Site.

In April 2009, the EPA initially conducted vapor intrusion sampling at 36 residences and commercial buildings near each of the four source areas identified in the OU2 ROD at the Site. Although EPA initially targeted additional properties near each of the source areas for vapor intrusion sampling based on their proximity to the underlying groundwater contamination, permission to perform the sampling was not received from all of the property owners. Where permission was granted, the EPA drilled through the subslabs in the basements and installed ports in order to sample the soil vapor under the buildings. Sampling devices called Summa canisters were attached to these ports to collect air at a slow flow rate over a 24-hour period. Summa canisters were also placed in indoor areas in each structure in order to evaluate if soil vapor is entering each building, and outside several residences to determine if there were any outdoor sources that may impact indoor air. The Summa canisters were then collected and sent to a laboratory for analysis.

The analytical results of the April 2009 vapor intrusion sampling indicated that nine homes and one commercial building had concentrations of VOCs at or above the EPA Region 2 screening levels in subslab vapor gases. However, all locations tested showed no concentrations of vapor intrusion gases in the indoor air of these locations above the EPA health-based levels.

In 2010 and 2011, the EPA retested properties that allowed access (seven homes and one commercial establishment) for the presence of vapor intrusion gases in both the subslab and indoor air. The data gathered revealed a declining trend in concentrations of vapor gases in the subslab of retested homes. One building located near the McGraw property showed TCE concentrations in the subslab vapor gas at 350 micrograms per cubic meter ($\mu g/m^3$) in 2009, 250 $\mu g/m^3$ in 2010, and nondetect in 2011. This building was retested in 2012 and 2014 and showed

concentrations of TCE in the subslab gas at 512 µg/m^3 and 443 µg/m^3, respectively. However, no vapor intrusion constituents above health-based levels were detected in the indoor air. Based on the presence of elevated concentrations of TCE in the subslab gas, the EPA intends to continue performing vapor intrusion monitoring at this building and, if determined necessary by the EPA, additional investigations could be undertaken.

In April 2011, the EPA performed an additional study in an area southwest of the Alcas Facility, and soil and groundwater samples were collected along Billington and Taggerty Avenues to, among other things, determine whether this area could be potentially impacted by vapor intrusion. The results did not reveal Site-related contamination in the soil samples; TCE was present in the groundwater at low levels (maximum concentration of 3.52 µg/L).

The EPA recently collected additional vapor intrusion data near the source areas in April 2015. The results did not show concentrations of vapor intrusion gases in the indoor air of these locations above EPA health-based levels. Based on the EPA's investigation thus far, including these recent data, the vapor-intrusion pathway does not constitute a significant risk to human health.

6. CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

6.1 Land Use

The AVX Property is situated within a designated industrial zone in the City of Olean. Farming and agriculture are nonexistent within the general vicinity. The AVX Property is bordered to the east and west by sparsely populated residential areas, to the north by Seneca Avenue, and to the south by the Conrail rail road tracks. The Allegheny River, a principal tributary of the Ohio River, which flows west-northwest through the southern portion of the Site, is located approximately 825 feet south of the AVX Property. The EPA expects that the land-use pattern at and surrounding the AVX Property will not change.

6.2 Groundwater Use

Three municipal water supply wells (18M, 37M and 38M) at the Site provide water for the City of Olean. These water supply wells draw water from the City Aquifer. An air stripper at municipal supply well 18M and a separate air stripper at municipal supply wells 37M and 38M treat the extracted groundwater before distribution to the public. The current total pumping rate for these municipal wells is approximately 3 million gallons per day. In addition, although the extension of the City of Olean's water line was completed in 1988, and private well users were connected to the public water supply in 1989, some residents refused the EPA's efforts to connect to the public water supply and continue to use private wells as a source of potable water. AVX has operated a production well (PW-1) at the AVX Property screened in the City Aquifer and used as noncontact cooling water in its manufacturing processes for the past 55 years, and is expected to continue to operate this well.

7. SUMMARY OF SITE RISKS

A baseline human health risk assessment (HHRA) was conducted in 1995 as part of the OU2 ROD to estimate the risks associated with current and future Site conditions at the AVX Property. A baseline or qualitative human health risk assessment is an analysis of the potential adverse human health effects caused by hazardous substance exposure in the absence of any actions to control or mitigate exposure under current and future land uses. The human health risk discussion below summarizes and updates conclusions from the 1995 HHRA.

7.1 Human Health Risk Assessment Process

The HHRA performed as part of the OU2 RI considered exposure to chemicals of potential concern (COPCs) at the Site. As required by the EPA policy, these assessments estimated the human health risk which could result from the contamination at the Site if no remedial actions were taken at the AVX Property. **Tables 1 through 5** in **Appendix II** present the relevant subset of data from the HHRA.

For the OU2 HHRA, a four-step human health risk assessment process was used for assessing Site-related cancer risks and noncancer health hazards. The four-step process is comprised of:

Hazard Identification – this step identifies the COPCs at a site based on several factors such as toxicity, frequency of occurrence, and concentration;

Exposure Assessment – this step estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed (i.e., ingestion and dermal contact with contaminated soil);

Toxicity Assessment – this step identifies the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and

Risk Characterization – this step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. During this step, contaminants with concentrations that exceed federal Superfund guidelines for acceptable exposure are identified. These guidelines are 10^{-4} to 10^{-6}, or one-in-ten-thousand to one-in-a-million excess occurrences for cancer, and a Hazard Index (HI) of greater than 1 (discussed further below) for noncancer health hazards. Contaminants with concentrations that exceed these guidelines are then considered chemicals of concern (COCs) for a site and are typically those that will require remediation. The uncertainties associated with the risk calculations are also evaluated under this step.

7.2 Human Health Risk Assessment

The baseline human health risk assessment that was conducted to support the remedial decision for the OU2 ROD evaluated the potential risks and hazards that may be associated with exposure to groundwater contamination at the Site through ingestion, dermal contact and inhalation of vapors during showering. **Tables 3, 4, and 5** in **Appendix II** provide detailed data summaries

from the baseline human health risk assessment for noncancer toxicity, cancer toxicity, and carcinogens and noncarcinogens risk characterization, respectively.

Based on the data collected since the OU2 ROD was issued in 1996, the results of the baseline risk assessment contained in the OU2 ROD have not substantially changed. As previously mentioned, the baseline risk assessment evaluated the health effects which would result from exposure to groundwater contamination through three pathways, namely, ingestion, dermal contact, and inhalation of volatilized contaminants during showering. Risks due to contaminants in the surface and subsurface soil were calculated for exposure as a result of dermal contact with, ingestion of, or inhalation of contaminants by construction workers. A residential exposure scenario for soil was not calculated because all of the properties studied during the OU2 RI/FS are zoned for industrial or commercial use. Most of these properties, including the AVX Property, continue to be used as commercial/industrial facilities and there is no expectation that this use will change in the future.

The investigations conducted subsequent to the OU2 ROD in 1996 revealed that the maximum concentrations of VOCs were detected beneath the building at a depth of five and 17 feet below the concrete slab floor of the building. Maximum concentrations of VOCs detected in surface and subsurface soil and groundwater at the AVX Property after the issuance of the OU2 ROD in 1996 are presented below:

Chemicals of Concern (COCs)	Surface Soil (0 – 2 Feet) (mg/kg)	Subsurface Soil (Below 2 Feet) (mg/kg)	Groundwater (µg/L)
cis-1,2 DCE	0.640	65	170,000
trans-1,2-DCE	ND	ND	550
1,2-DCA	NA	ND	131
1,1,1-TCA	0.044	990	348,000
TCE	0.49	650	320,000
Toluene	ND	460	39,000
PCE	0.082	270	55,000
Vinyl Chloride	0.060	ND	17,000
Xylene	ND	315	5,000

ND – Non-detect
NA – Not Analyzed

The baseline risk assessment in the OU2 ROD identified carcinogenic risk and/or noncarcinogenic hazards that were above the acceptable carcinogenic risk range of 10^{-6} to 10^{-4} and the noncarcinogenic hazard index (HI) of 1. As discussed in more detail below, the EPA has determined that the results of the OU2 ROD risk assessment for the AVX Property have not substantially changed.

Soil

As part of the remedy modification process, the EPA conducted a qualitative analysis of the data to evaluate the risks associated with the elevated VOC concentrations detected in soil at the AVX Property subsequent to the issuance of the OU2 ROD. The estimated total risks and hazards are

primarily due to elevated concentrations of *cis*-1,2-DCE, 1,1,1-TCA, TCE, toluene, PCE and xylene in the subsurface soil five feet below the concrete slab floor of the building. **Table 1** in **Appendix II** provides minimum and maximum VOC concentrations detected in soil during the OU2 RI and during the post-OU2 ROD investigations at the AVX Property. Based on this analysis, the EPA has determined that the results of the OU2 ROD risk assessment did not substantially change.

Groundwater

The higher soil contaminant concentrations below the main building could also serve as a source material for continued groundwater contamination. The results of the baseline risk assessment performed for OU2 indicated that ingestion of and dermal contact with untreated groundwater at the Site poses unacceptable risks to human health. The baseline risk assessment evaluated all Site-related contaminants, however, the estimated total risks were primarily due to TCE. Cancer risks due to ingestion of groundwater were determined to be approximately one-in-one-hundred for adults and young children (1.5×10^{-2} and 1.3×10^{-2}, respectively) and six-in-one-thousand (5.9×10^{-3}) for older children. The noncarcinogenic HI for these exposure groups were 3.4 for adults, 14.7 for young children, and 6.7 for older children. Cancer risks due to dermal contact with groundwater contaminants were determined to be 2.4×10^{-3} for adults, 9.2×10^{-4} for young children and 6.7×10^{-4} for older children. The noncarcinogenic HIs for these exposure groups were less than one.

Cancer and noncancer risks due to inhalation of contaminants from untreated groundwater during showering were within the EPA's acceptable risk range. Cancer risks for adults were determined to be 6.4×10^{-5} for adults and 6.0×10^{-5} young children, and 2.7×10^{-5} for older children. The noncarcinogenic HIs for these exposure groups were less than one. The cumulative upper-bound cancer risks for exposure through ingestion, dermal contact, and inhalation to untreated groundwater at the Site were 1.7×10^{-2} for adults, 1.4×10^{-2} for young children and 6.6×10^{-3} for older children, which are greater than the acceptable risk range of 10^{-4} to 10^{-6}. The estimated total risks were primarily due to TCE, which contributed significantly to the carcinogenic risk calculations and was attributable to releases of the contaminant into the ground and eventually into the groundwater.

As part of the remedy modification process, the EPA conducted a qualitative analysis of the data to estimate the risks associated with the elevated VOC concentrations detected in groundwater at the AVX Property subsequent to the issuance of the OU2 ROD. Although the baseline risk assessment performed for the OU2 ROD evaluated exposure to untreated groundwater for the four source areas collectively, each VOC detected at the AVX Property exceeded federal MCLs and State standards (see **Table 6** in **Appendix II**). Furthermore, this qualitative analysis revealed that the estimated total risks at the AVX Property were due to additional contaminants other than TCE and 1,1,1-TCA, including *cis*-1,2-DCE and PCE. The maximum concentration of TCE, 1,1,1-TCA, *cis*-1,2-DCE and PCE detected in groundwater during the OU2 RI at the Site was 110,000 µg/L, 360,000 µg/L, 3,200 µg/L and 14,000 µg/L, respectively. Although the OU2 RI revealed maximum detected concentrations of TCE, 1,1,1-TCA, *cis*-1,2-DCE and PCE at the AVX Property of 110,000 µg/L, 360,000 µg/L, 3,200 µg/L and 14,000 µg/L, respectively, additional data collected subsequent to the OU2 ROD revealed maximum concentrations of 320,000 µg/L, 348,000 µg/L, 170,000 µg/L, and 55,000 µg/L for the respective contaminants at the AVX Property. **Table 1** in **Appendix II** provides minimum and maximum VOC concentrations detected

in groundwater during the OU2 RI and during the post-OU2 ROD investigations at the AVX Property. Because most of the values are higher than the values reported in the OU2 ROD, the results of the baseline risk assessment contained in the OU2 ROD for groundwater did not substantially change based on these concentrations.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled. Uncertainties in the exposure assessments are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure could occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure. Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals.

These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper-bound estimates of the risks to populations near the Site, and is unlikely to underestimate actual risks related to the Site.

7.3 Ecological Risk Assessment

The AVX Property is approximately 18.5 acres in size and includes lawns, plantings, a building with asphalt entry ways and parking areas, as well as wetlands and a wooded area to the south of the building. The area within the fence, which includes the lawn, plantings and parking area, does not provide significant habitat that could potentially support indigenous wildlife receptor species. Therefore, there are no ecological risks within the fenced area. For the area outside of the fence, which includes the wooded area and wetland area, a qualitative ecological risk assessment was conducted as part of the OU2 ROD to determine if contamination present at the AVX Property was impacting the wooded or wetland area. Given that the potential source of contamination in the wooded and wetland area would be contaminated groundwater discharging to the sediments, three sediment samples were collected from the wetlands. Analysis of the samples did not reveal any VOC contamination. Several semi-volatile organic compounds (SVOCs) were detected, but were not attributed to the AVX Property. The EPA determined that the SVOCs were not

impacting the groundwater. Based on this evaluation, it was determined that there is not a completed exposure pathway from the AVX property to the wooded or wetland areas.

7.4 Basis for Taking Action

The results of the investigations and the human health risk assessments indicate that the contaminated soil and groundwater at the AVX Property present an unacceptable exposure risk. The ecological evaluation indicates that the AVX Property does not pose any unacceptable risks to aquatic or terrestrial ecological receptors.

The presence of elevated concentrations of VOCs in soil below the building at the AVX Property does not pose unacceptable direct-contact risks to users of that property, given the depth of contamination and the presence of the building. However, the contaminated soil serves as source material for continued groundwater contamination. Therefore, it is necessary to address the soil contamination as well as the groundwater contamination.

It is the EPA's determination that the selected interim remedy is necessary to protect public health or welfare or the environment in the short term from actual or threatened releases of hazardous substances into the environment, until a final remedy is selected for the AVX Property.

8. REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) criteria, other guidance documents, and site-specific risk-based levels.

The RAOs for the AVX Property in the OU2 ROD were developed for two contaminated media – groundwater and soil. The RAOs were designed to restore the upper and lower aquifers to their beneficial use as a source of drinking water. Groundwater objectives included the removal and/or control of the sources of contamination to the groundwater and the removal of sources of contamination already in the groundwater. Soil objectives included the elimination of leaching of contaminants of concern from the soil at each of the source areas into the groundwater.

The groundwater RAOs for the AVX Property for this interim remedy modification remain consistent with the OU2 ROD. They are:

- Restore the City Aquifer beneath the AVX Property to its beneficial use as a source of drinking water by reducing contaminant levels to the more stringent of federal MCLs or New York State standards;
- Minimize, contain and/or eliminate sources of VOC contaminants already in the shallow groundwater at the AVX Property; and
- Minimize and/or eliminate the potential for future human exposure to Site contaminants via contact with contaminated groundwater and/or inhalation of vapors.

Contaminated soil at the AVX Property is acting as a continuing source of contamination to groundwater. As a result, groundwater at the AVX Property cannot be fully restored until the

remaining source material below and adjacent to the building is addressed. Therefore, this interim remedy is not expected to meet the groundwater restoration objective of the 1996 OU2 ROD. However, by minimizing the leaching of contaminants from the soil to the groundwater in conjunction with alternatives to address the Downgradient Till Unit and the City Aquifer, the EPA expects to reduce contaminant levels in the groundwater until a final remedy for the AVX Property is selected. Currently, groundwater restoration is one of the EPA's goals for the final Site remedy.

The groundwater remediation goals established for this interim remedy modification are identified in **Table 6** in **Appendix II.**

The soil RAOs for the AVX Property for this interim remedy modification are:

- Minimize, contain and/or eliminate VOC contaminants from soil at the AVX Property that are leaching into the groundwater; and
- Minimize and/or eliminate the potential for human exposure to Site contaminants via contact with contaminated soil and/or inhalation of vapors.

Soil remediation goals for addressing the AVX Property soil contamination are also identified in **Table 6** in **Appendix II.**

9. SUMMARY OF REMEDIAL ALTERNATIVES

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

The OU2 ROD evaluated six remedial alternatives to address the contamination at the AVX Property: 1) No Action, 2) Institutional Controls, 3) Capping, 4) Groundwater Pump-and-Treat, 5) Vacuum Enhanced Recovery, and 6) Excavation, Treatment and Disposal.

Additional characterization of the contamination at the AVX Property, after the OU2 ROD was issued and after it was determined that the selected remedy identified in the OU2 ROD could not be fully implemented, resulted in the evaluation of remedial technologies as part of the February 4, 2015 FS Report to address the AVX Property.

The FS Report evaluated various technologies to remediate the contaminated soil and groundwater at the AVX Property. To address this contamination, remedial alternatives were developed for three different remediation areas: Historical Source Area, Downgradient Till Unit, and the City Aquifer.

The following four remedial alternatives were evaluated in the FS Report for contaminated soil and groundwater in the Historical Source Area:

- No Action (Alternative S-1)
- Exposure Barrier (Alternative S-2)
- *In-Situ* Thermal Remediation (Alternative S-3)
- Multi-Phase Extraction (Alternative S-4)

The following three remedial alternatives were evaluated in the FS Report for the contaminated groundwater in Downgradient Till Unit

- No Action (Alternative DTGW-1)
- Hydraulic Trench Containment (Alternative DTGW-3)
- Permeable Reactive Barrier (Alternative DTGW-4)

Although the FS Report included and evaluated Monitored Natural Attenuation (MNA) for the Downgradient Till Unit, identified as DTGW-2, this alternative was not carried forward as a stand-alone alternative, because it would not meet the RAOs for this interim action.

The following two remedial alternatives were evaluated in the FS Report for the contaminated groundwater in the City Aquifer at the AVX Property.

- No Action (Alternative CAGW-1)
- Hydraulic Pumping Containment (Alternative CAGW-2)

Detailed descriptions of the interim remedial alternatives for addressing the contamination associated with the AVX Property can be found in the February 4, 2015 FS Report, which is part of the administrative record for this OU2 ROD Amendment, and can be found in the information repositories identified above.

The construction time for each remedial alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any PRPs, or procure contracts for design and construction.

9.1 Description of Common Elements Among Remedial Alternatives

With the exception of the no action alternatives, all of the alternatives for the Historical Source Area, the Downgradient Till Unit, and the City Aquifer, include common components as follows:

Long-Term Monitoring:
A long-term monitoring program would be implemented to verify the effectiveness of the selected interim remedy. The long-term groundwater monitoring program would consist of a comprehensive monitoring well network comprised of existing monitoring wells and potentially additional monitoring wells and piezometers on and off the AVX Property, within the till unit and City Aquifers to verify the effectiveness of the interim remedy. It would also include additional geochemical monitoring to further evaluate conditions in groundwater.

Institutional Controls:
A plan would be developed which would specify institutional controls to restrict exposure to

hazardous substances until RAOs are met. Such controls could include proprietary controls, such as deed restrictions for groundwater and soil use, existing governmental controls, such as well permit requirements, and informational devices, such as publishing advisories in local newspapers and issuing advisory letters to local governmental agencies regarding groundwater use in the impacted area.

Site Management Plan:
A Site management plan (SMP) would be developed to provide for the proper management of the interim remedy at the AVX Property post-construction including the management of any contaminated unsaturated soil and the evaluation of the potential for vapor intrusion at the existing building at the AVX Property and/or for any buildings constructed in the future, and mitigation, if necessary. The SMP would also include the implementation, management, and maintenance of institutional controls (discussed above), the long-term groundwater monitoring program (discussed above), periodic reviews, and certifications. A change in the current use of the building in the future would trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy.

In addition, because any combination of remedial alternatives evaluated will result in contaminants remaining on the AVX Property above levels that would allow for unrestricted use and unlimited exposure, a review of conditions at the Site will be conducted no less often than once every five years. If justified by the review, additional response actions might be implemented.

9.2 Description of Remedial Alternatives

Historical Source Area

Alternative S-1: No Action

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be used as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the AVX Property to address soil and groundwater contamination in the Historical Source Area.

Alternative S-2: Exposure Barrier

Capital Cost:	$17,500
Annual O&M Costs:	$30,000
Present-Worth Cost:	$406,000[4]
Construction Time:	3 months

[4] The June 2015 Proposed Plan identified a present-worth cost of $627,000. However, the present-worth cost has been revised to be consistent with information contained in the FS Report and other supporting documentation.

Under this alternative, existing surface covers (the building, paved areas in the northern part of the Historical Source Area, and the vegetative cover in the drainage swale area) would be maintained to minimize potential leaching of VOC contamination from soil to groundwater and would also serve as a direct contact exposure barrier. Activities involved in maintaining the surface cover may potentially include items such as inspecting the asphalt cap and vegetative cover, filling cracks within the asphalt cap as needed, partial replacement of the asphalt cap as needed, clearing invasive vegetation, and seeding the vegetative cover as needed. The building and pavement in the northern part of the Historical Source Area will limit potential receptor exposure in these locations and minimize further migration of contaminants from soil to groundwater.

Alternative S-3: *In-situ* Thermal Remediation

Capital Cost:	$1,320,000
O&M Costs:[5]	$1,125,000
Present-Worth Cost:	$3,306,000
Construction Time:	12 months

This alternative would employ *in-situ* thermal remediation in accessible areas to remediate VOC contamination in soil and groundwater in the till unit.

To implement *in-situ* thermal remediation using electrical resistance heating, a series of electrodes, vapor extraction wells, and sensor wells would be installed within soil and till unit treatment areas. An electrical current would be passed from electrode to electrode through the water contained in the soil/groundwater matrix, causing the temperatures of the soil and groundwater to increase. The increased temperature would cause the vapor pressure of the target VOCs to rise and increase the volatilization and recovery of these constituents through soil vapor extraction. The VOCs would be collected above grade and treated, as necessary, to remove contaminants. Steam vapors would also be produced, which would increase the subsurface permeability and the efficiency of the vapor extraction wells. For the purposes of developing a conceptual design and cost estimate for comparison with other technologies, the FS estimated a target temperature for the treatment area of slightly less than 100 degrees Celsius with a treatment depth of 25 feet below ground surface (bgs). The volume of accessible soil that would be remediated by the *in-situ* thermal remediation system is estimated to be 33,000 cubic yards. O&M activities associated with this operation may include groundwater and vapor sampling; maintaining the vapor extraction wells; and balancing the applied vacuum, water recharge, and electrical currents to optimize the system performance.

Alternative S-4: *In-situ* Multi-Phase Extraction

Capital Cost:	$736,000
Annual O&M Costs:	$120,000
Present-Worth Cost:	$1,988,000
Construction Time:	10 months

[5] O&M costs presented for Alternative S-3 are total costs, instead of annual costs.

This alternative would employ *in-situ* multi-phase extraction (MPE) of contaminated soil and groundwater to remediate the VOCs in soil and groundwater in the till unit in accessible areas.

MPE involves the installation of an extraction well network and application of a vacuum to each well to simultaneously extract VOCs from the soil (in both the saturated and unsaturated zone) and the groundwater zone. For the purposes of developing a conceptual design and cost estimate for comparison with other technologies, the FS estimated that the MPE system would consist of a network of 25-foot-deep extraction wells with a target radius of influence of 15 feet for each well. The volume of accessible soil to be remediated by the MPE system is estimated to be approximately 33,000 cubic yards. A groundwater extraction rate of 0.5 gpm per well is estimated, with a total groundwater extraction rate of 7 gpm. A vapor extraction rate of 30 cubic feet per minute is estimated with a total vapor extraction rate of 390 cubic feet per minute.

Downgradient Till Unit

Alternative DTGW-1: No Action

Capital Cost:	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be used as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the AVX Property to address groundwater contamination in the Downgradient Till Unit.

Alternative DTGW-3: Hydraulic Trench Containment

Capital Cost:	$355,000
Annual O&M Costs:	$125,000
Present-Worth Cost:	$1,943,000
Construction Time:	5 months

This alternative would employ a hydraulic containment and treatment system to prevent further migration of groundwater contamination.

Due to the limited permeability of the saturated zone underlying the AVX Property, this alternative would employ a groundwater extraction trench instead of a vertical extraction well network to extract groundwater for treatment and disposal. For the purposes of developing a conceptual design and cost estimate for comparison with other alternatives, the FS Report estimated that a hydraulic trench would be installed at the AVX Property boundary and operate at an optimal extraction rate estimated to be about 10 gpm for 30 years. The construction of a gravel trench that is 200 feet long, 20 to 25 feet deep, and 2 feet wide would create a more permeable zone where groundwater would be extracted and allow for hydraulic capture from a large area with a low groundwater extraction rate. Extracted groundwater would be treated (e.g., air stripping and granular activated carbon) prior to discharge to the surface water drainage ditch at the southern edge of the AVX Property. During the remedial design, an evaluation would be conducted to determine the impacts, if any, of these construction activities on the wetlands area and a wetlands mitigation plan would

be developed, as determined necessary. In addition, during the remedial design, performance tests would be conducted to ensure that the remedial objectives are achieved.

O&M activities associated with the extraction trench and groundwater treatment system would include system inspections, adjustments, and repairs, replacing the granular-activated carbon as it is spent, maintenance of the air stripper, and treatment system effluent sampling.

Alternative DTGW-4: Permeable Reactive Barrier

Capital Cost:	$671,000
Annual O&M Costs:	$48,000
Present-Worth Cost:	$1,062,000
Construction Time:	4 months

Under this alternative, a Permeable Reactive Barrier (PRB) containing a reactive material such as zero valent iron (ZVI) would be installed at the AVX Property boundary to remediate some of the VOCs[6] present in the groundwater of the till unit, preventing the migration of them in the till unit past the AVX Property boundary.

A PRB consists of a permeable wall built below the ground surface to intercept and treat contaminated groundwater. The PRB would be built by excavating a narrow trench perpendicular to the path of transport of contamination in groundwater and filling the trench with a reactive material, such as ZVI, that can destroy or mitigate the transport of VOC-contaminated groundwater while allowing the passage of water. For the purposes of developing a conceptual design and cost estimate for comparison with other alternatives, the FS Report estimated that the PRB would consist of one 200-foot-long, 25-foot-deep, and 1-foot-wide barrier at the AVX Property boundary. The PRB would be constructed from a mix of 60% ZVI and 40% sand, and would require replacement approximately every 20 years based on the estimated lifespan of the reactive materials. During the remedial design, an evaluation would be conducted to determine the impacts, if any, of these construction activities on the wetlands area and a wetlands mitigation plan would be developed, as determined necessary. In addition, performance tests would be conducted to ensure that the remedial objectives are achieved.

O&M activities associated with the PRB would include inspection of the barrier system and potential change-out of the reactive material.

<u>City Aquifer</u>

Alternative CAGW-1: No Action

Capital Cost:	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

[6] 1,2-DCA, toluene, xylenes, and acetone are known to be present at the AVX Property but are not amenable to treatment with ZVI.

The NCP requires that a "No Action" alternative be used as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the AVX Property to address groundwater contamination in the City Aquifer.

Alternative CAGW-2: Hydraulic Pumping Containment

Capital Cost:	$26,000[7]
Annual O&M Costs:	$113,000
Present-Worth Cost:	$1,228,000[8]
Construction Time:	0 months

Under this alternative, the existing production well at the AVX Property would act as an active groundwater recovery and containment system to prevent further migration of contaminated groundwater. This system consists of one existing production well operating at an optimal extraction rate of 300 to 400 gpm to provide hydraulic control.

O&M activities associated with the groundwater pumping system would include system inspections, adjustments, repairs, extraction well cleaning and maintenance, and sampling of the effluent to meet the substantive requirements of state pollution discharge elimination system (SPDES) or publicly owned treatment works discharge permit requirements. The production well currently meets existing discharge requirements. However, if surface-water discharge limits would not be met during implementation of this alternative, an air stripper or carbon adsorption system or combination thereof would be added to the extraction system. In addition, monitoring parameters would include, among other items, data collection to ensure that hydraulic containment is being achieved. If hydraulic containment is not being achieved, then additional extraction wells would be installed or the pumping rates changed to ensure hydraulic containment.

10. COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy for a site, the EPA considers the factors set forth in CERCLA Section 121, 42 U.S.C. § 9621, by conducting a detailed analysis of remedial alternatives pursuant to the requirements of the NCP at 40 C.F.R. § 300.430(e)(9), the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies*, OSWER Directive 9355.3-01, and the EPA's *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, OSWER 9200.1-23.P. The detailed analysis consists of an assessment of the individual alternatives against each of the nine evaluation criteria set forth at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following **"threshold"** criteria are the most important and must be satisfied by any remedial alternative in order to be eligible for selection:

[7] While unlikely, the FS Report includes capital, present-worth, and 30 year O&M cost estimates in the amounts of $729,000, $1,950,500, and $1,842,000, respectively, for treatment of extracted groundwater, if necessary.

[8] The June 2015 Proposed Plan identified a present-worth cost of $1,403,000. However, the present-worth cost has been revised to be consistent with information contained in the FS Report and other supporting documentation.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with ARARs** addresses whether a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are TBCs. While TBCs are not required to be adhered to by the NCP, the NCP recognizes that they may be very useful in determining what is protective of a site or how to carry out certain actions or requirements.

The following **"primary balancing"** criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. **Long-term effectiveness and permanence** refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once remediation goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. **Reduction of toxicity, mobility, or volume through treatment** is the anticipated performance of the treatment technologies, with respect to these parameters, that a remedy may employ.

5. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation of the remedy.

6. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital, O&M, and present-worth costs.

The following **"modifying"** criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and they may prompt modification of the preferred remedy that was presented in the Proposed Plan:

8. **State acceptance** indicates whether, based on its review of the RI/FS report, HHRA, and Proposed Plan, the State concurs with, opposes, or has no comments on the proposed remedy.

9. **Community acceptance** refers to the public's general response to the alternatives described in the RI/FS report, HHRA, and Proposed Plan.

As the remedial alternatives summarized in this OU2 ROD Amendment are interim in nature, in accordance with the EPA guidance, these alternatives are expected to be protective of human health and the environment in the short term and are intended to provide adequate protection until a final ROD for the AVX Property is issued. A comparative analysis of the remedial alternatives considered in this OU2 ROD Amendment, based upon the evaluation criteria noted above, and the

interim nature of this remedy, follows.

10.1 Overall Protection of Human Health and the Environment

Historical Source Area

Since no action would be implemented, Alternative S-1 (No Action) would not meet RAOs, would not control exposure to contaminated soil and groundwater, and would not reduce risk to human health or the environment. Although Alternative S-2 (Exposure Barrier) would prevent exposure to contaminants in the soil and groundwater in the till unit, this alternative would not be effective in reducing concentrations of VOC contamination in soil or groundwater in the Historical Source Area. Alternatives S-3 (*In-Situ* Thermal Remediation) and S-4 (*In-Situ* Multi-Phase Extraction) are both active remedies that would remediate contamination in accessible areas in the Historical Source Area; however, these alternatives would not address contamination in non-accessible areas, including beneath the manufacturing building where most of the highest concentrations of contaminants are present, acting as a continuing source of contamination. As such, Alternatives S-2, S-3 and S-4 are expected to provide a similar level of protection of human health and the environment for the Historical Source Area. Alternatives S-2, S-3 and S-4 achieve interim protectiveness by limiting exposure to contaminants through the implementation of institutional controls. Since this is an interim remedy, Alternatives S-2, S-3 and S-4 would each be protective of human health and the environment for the Historical Source Area in the short term and are intended to provide adequate protection until a final ROD for the AVX Property is issued.

Downgradient Till Unit

Since no action would be implemented, Alternative DTGW-1 would not meet RAOs, would not control exposure to contaminated groundwater, would not reduce risk to human health or the environment, and would not contain or restore the groundwater. Alternatives DTGW-3 and DTGW-4 would treat contaminated groundwater from the downgradient till unit prior to groundwater migrating off the AVX Property. Alternative DTGW-3 provides a higher level of protection of human health and the environment than DTGW-4 by providing treatment to more of the VOCs in the groundwater of the till unit. Protectiveness under Alternatives DTGW-3 and DTGW-4 require a combination of actively reducing contaminant concentrations prior to groundwater migration off the AVX Property and limiting exposure to contaminants through the implementation of institutional controls. Since this is an interim remedy, Alternatives DTGW-3 and DTGW-4 would each be protective of human health and the environment in the short term and are intended to provide adequate protection until a final ROD for the AVX Property is issued.

City Aquifer

Since no action would be implemented, Alternative CAGW-1 would not meet RAOs, would not control exposure to contaminated groundwater, would not reduce risk to human health or the environment, and would not restore the groundwater. Alternative CAGW-2 is an active remedy that would prevent the migration of VOCs from the AVX Property into the City Aquifer. Protectiveness under Alternative CAGW-2 requires a combination of actively controlling the migration of contaminated groundwater in the City Aquifer and limiting exposure to contaminants through the implementation of institutional controls. Since this is an interim remedy, Alternative

CAGW-2 would be protective of human health and the environment in the short term and is intended to provide adequate protection until a final ROD for the AVX Property is issued.

10.2 Compliance with ARARs

The EPA and NYSDOH have promulgated health-based protective MCLs and standards (40 CFR Part 141, and 10 NYCRR § 5-1.51 Chapter 1), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). The federal MCLs and State standards for the AVX Property are identified in **Table 6** in **Appendix II.** If the standards are not equivalent, compliance with the more stringent standard is required. The aquifers underlying the AVX Property are designated as potable water supplies.

The EPA has identified New York State's 6 NYCRR Parts 375-6.4(b)(3) and 375-6.5, the Soil Cleanup Objectives (SCOs), as ARARs, TBCs, or other guidance to address contaminated soil at the AVX Property. Refer to **Table 6** in **Appendix II** for the remediation goals for soil.

However, this interim action is only expected to comply with ARARs that are relevant to the limited scope of this action.

Historical Source Area

Alternative S-1 would not comply with ARARs as no work would be conducted to address the contamination. Alternatives S-2, S-3, and S-4 would comply with location- and action-specific ARARs. None of the alternatives would achieve contaminant-specific ARARs, such as MCLs, or SCOs, at this time.

Downgradient Till Unit

Alternative DTGW-1 would not comply with ARARs as no work would be conducted to address the contamination. Alternatives DTGW-3 and DTGW-4 would comply with location- and action-specific ARARs, but would not comply with chemical-specific groundwater restoration ARARs, although each would provide adequate protection until a final ROD for the AVX Property is issued.

With respect to chemical-specific ARARs for the treated groundwater, while the hydraulic containment under Alternative DTGW-3 would comply with these ARARs, the PRB under Alternative DTGW-4 would not treat some of the VOCs and, therefore, not all chemical-specific ARARs in the treated groundwater would be met. Specifically, the compounds 1,2-DCA, toluene, xylenes, and acetone known to be present at the AVX Property are not treatable with ZVI.

City Aquifer

Alternative CAGW-1 would not comply with ARARs as no work would be conducted to address the contamination. Alternative CAGW-2 would comply with location- and action-specific ARARs, but may not achieve chemical-specific ARARs, although CAGW-2 would reduce the overall time to achieve chemical-specific ARARs and provide adequate protection until a final ROD for the AVX Property is issued.

10.3 Long-Term Effectiveness and Permanence

As indicated above, interim remedies are intended to be protective of human health and the environment in the short term, and to provide adequate protection until a final ROD is issued. The contamination mass remaining in soil at the AVX Property results in the continued releases of hazardous substances to the groundwater and, as such, limits the long-term effectiveness of any of the alternatives for the AVX Property to achieve the remediation goals for soil or groundwater. This interim remedy, therefore, is not intended to provide a permanent remedy for the AVX Property.

Historical Source Area

Alternative S-1 does not provide long-term effectiveness or permanence because no active remedial measures are proposed. Alternatives S-3 and S-4 would provide a higher degree of long-term effectiveness and permanence than Alternative S-2, since *in-situ* thermal treatment and MPE are proven technologies to address VOC contamination considering the silty soil and limited permeability conditions present in the accessible areas within the Historical Source Area. However, as discussed previously, the alternatives considered for this area cannot address VOC-contaminated soil beneath the AVX building, and would result in contaminant mass remaining in soil beneath and adjacent to the building at the AVX Property, resulting in continued releases of hazardous substances to the groundwater and thus, limiting long-term effectiveness.

Downgradient Till Unit

Alternative DTGW-1 does not provide long-term effectiveness or permanence because no active remedial measures are proposed. Alternative DTGW-3 would prevent potential receptor exposure downgradient of the AVX Property as well as on-property by intercepting and treating all VOCs. Alternative DTGW-4 may not be completely effective due to the inability of the PRB to treat certain contaminants known to be present at the AVX Property. Although some of these non-treatable contaminants do not appear to be widespread in the groundwater at the AVX Property, it is possible that, with time, these contaminants could reach the southern boundary of the AVX Property. 1,2-DCA, one of the contaminants that cannot be treated with the PRB, is already known to be present at the down-gradient boundary of the AVX Property. Alternative DTGW-4 would have greater risk over the long term than Alternative DTGW-3 due to the presence of non-ZVI treatable contaminants, particularly 1,2-DCA. Alternative DTGW-3 would avoid the uncertainties associated with PRB through treatment of all contaminants and ensure that all present and potential future contaminants reaching the AVX Property boundary would be effectively intercepted and removed.

City Aquifer

Alternative CAGW-1 does not provide long-term effectiveness or permanence because no active remedial measures are proposed. Hydraulic control under Alternative CAGW-2 would be an effective long-term technology to prevent the migration of contamination in the City Aquifer, if operated properly. As discussed previously, the contamination mass remaining in soil at the AVX Property would result in the continued releases of hazardous substances to the groundwater and,

as such, limits the long-term effectiveness of Alternative CAGW-2 to achieve MCLs in the City Aquifer at the AVX Property.

10.4 Reduction of Toxicity, Mobility or Volume

Because this action does not constitute the final remedy for the AVX Property, the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element is not fully addressed here but will be satisfied by the final response action.

Historical Source Area

Alternative S-1 does not address contamination through treatment as no action would be taken. Under Alternative S-2, the soil covers would minimize leaching of VOCs from soil to the groundwater in the till unit. However, Alternative S-2 would not reduce the toxicity or volume of VOCs present in the Historical Source Area. Alternatives S-3 and S-4 would both provide a reduction of contamination volume, toxicity and mobility in accessible areas of the Historical Source Area. Alternatives S-3 and S-4, however, would not reduce further the mobility of contamination, in particular, the remaining contamination in non-accessible areas, from the till unit Groundwater Aquifer to the City Aquifer. The highest concentrations of contaminants are present in non-accessible areas beneath the manufacturing building where Alternatives S-3 and S-4 would not provide any reduction of contamination volume, toxicity and mobility.

Downgradient Till Unit

Alternative DTGW-1 does not address contamination through treatment as no action would be taken. Alternative DTGW-3 would provide the greatest reduction in mobility, toxicity, and volume of VOCs by intercepting and treating the contaminated groundwater in the till unit prior to migrating off-property. Alternative DTGW-4 would reduce the mobility, toxicity, and volume of most but not all VOCs in groundwater in the till unit prior to groundwater migrating off-property. Exceptions would be 1,2-DCA, toluene, xylenes, and acetone. Although toluene, xylenes, and acetone may not reach the down-gradient boundary of the AVX Property in the near future, 1,2-DCA is already known to be present at and beyond the downgradient property boundary and would continue to migrate off-property under Alternative DTGW-4. 1,2-DCA, for example, has been detected at a concentration three times greater than its remediation goal along the southern boundary of the AVX Property where the PRB would be installed.

City Aquifer

Alternative CAGW-1 does not actively address contamination as no action would be taken. Alternative CAGW-2 would provide hydraulic control of contaminated groundwater in the City Aquifer, thereby preventing further migration of contaminated groundwater beyond the AVX Property. In the event that an air stripper or carbon adsorption system or combination thereof would be added to the extraction system to meet surface water discharge requirements, this alternative would provide additional reduction of toxicity and volume of VOCs.

10.5 Short-Term Effectiveness

Historical Source Area

Alternative S-1 would have the fewest short-term impacts since no work would be performed and, therefore, there would be no construction-related risks posed. Alternative S-2 would require limited activities (i.e., surface cover maintenance and groundwater monitoring) that would result in short-term exposure risks to workers, the public, or the environment, although these activities would be managed through engineering controls (e.g., air monitoring, dust suppression, personal protection equipment, etc.), and worker training. Alternative S-2 has an estimated implementation timeframe of 3 months. The installation of the electrodes and associated extraction wells for Alternative S-3 and MPE wells for Alternative S-4 may result in short-term exposure risks to workers, the public, or the environment, but these potential risks would also be managed through engineering controls, vapor monitoring and mitigation, and worker training. The implementation timeframes for Alternatives S-3 and S-4 are estimated at 12 months and 10 months, respectively.

Downgradient Till Unit

Alternative DTGW-1 would have the fewest short-term impacts since no work would be performed and, therefore, there would be no construction-related risks posed. Alternative DTGW-3 could have potential impact on workers, communities, or the environment from the installation of a hydraulic containment trench, with treatment system, and O&M of the extraction system; however, those impacts would be managed through engineering controls (e.g., air monitoring, dust suppression, personal protection equipment, etc.), and worker training. Implementation of Alternative DTGW-3 is estimated at 5 months. Alternative DTGW-4 would have similar potential short-term impacts to workers, the public, or the environment from the initial installation of the PRB and subsequent replacement when it would have to be completely removed and replaced, if it is still in place when the EPA selects a final remedy for the AVX Property. Alternative DTGW-4 has an estimated implementation timeframe of 4 months. Potential short-term impacts would be managed through engineering controls and worker training.

City Aquifer

Alternative CAGW-1 would have the fewest short-term impacts since no work would be performed and, therefore, there would be no construction-related risks posed. Under Alternative CAGW-2, the groundwater extraction well PW-1 is already installed and operating. Minimal exposure risks to workers, the public, or the environment would be posed by O&M of the extraction system, including should an air stripper or carbon adsorption system or combination thereof be required in order to meet SPDES requirement, and the expanded groundwater monitoring activities. These potential risks would be managed through engineering controls (e.g., air monitoring, dust suppression, personal protection equipment, etc.), and worker training. Alternative CAGW-2 requires no time to construct since it is anticipated that the existing production well will serve as the extraction well.

10.6 Implementability

Historical Source Area

Alternative S-1 is no action and, therefore, there is nothing to implement. There are no implementability issues associated with Alternatives S-2, S-3 and S-4. Each of these alternatives involve well-established technologies with commercially available equipment and are implementable.

Alternative S-2 would be easier to implement than Alternatives S-3 and S-4 since it does not require the construction of a treatment system.

Downgradient Till Unit

Alternative DTGW-1 is no action and, therefore, there is nothing to implement. Alternatives DTGW-3 and DTGW-4 involve well-established technologies with commercially available equipment and are implementable. Under Alternative DTGW-3, long-term O&M of the equipment would be required. Sufficient hydraulic capture is expected to be achieved through a relatively low groundwater extraction rate. Under Alternative DTGW-4, maintenance of the PRB would be limited in that the reactive ZVI material within the barrier would require replacement after approximately every 20 years if it is still an integral component of the remedy at that time. Alternative DTGW-4 would also avoid the need for a surface water treatment system that requires maintenance and security that is required for Alternative DTGW-3.

City Aquifer

Alternative CAGW-1 is no action and, therefore, there is nothing to implement. Alternative CAGW-2 involves a well-established technology with commercially available equipment and is already operating at the AVX Property. Alternative CAGW-2 would require O&M for the life of the remedy including groundwater quality, performance, administrative, and institutional controls monitoring.

10.7 Cost

The estimated capital costs, O&M costs, and present-worth costs for the alternatives discussed in this OU2 ROD Amendment are presented below. Further detail may be found in the FS Report. The cost estimates are based on the best available information and are accurate within a range of +50 to -30 percent.

Alternative	Capital & Periodic Cost	Annual O&M Cost	Present-Worth Cost
Historical Source Area			
S-1 - No Action	$0	$0	$0
S-2 - Exposure Barrier	$17,500	$30,000	$406,000
S-3 - *In-Situ* Thermal Remediation	$1,320,000	$1,125,0009	$3,306,000
S-4 - *In-Situ* Multi-Phase Extraction	$736,000	$120,000	$1,988,000
Downgradient Till Unit			
DTGW-1 - No Action	$0	$0	$0
DTGW-3 - Hydraulic Trench Containment	$355,000	$125,000	$1,943,000
DTGW-4 - Permeable Reactive Barrier	$671,000	$48,000	$1,062,000
City Aquifer			
CAGW-1 - No Action	$0	$0	$0
CAGW-2 - Hydraulic Pumping Containment	$26,000	$97,000	$1,228,000

10.8 State/Support Agency Acceptance

NYSDEC concurs with the interim modified OU2 remedy selected herein.

10.9 Community Acceptance

The EPA solicited input from the community on the remedial alternatives proposed for the amended OU2 remedy for the AVX Property. Verbal comments received from community members at the June 23, 2015 public meeting generally related to the extent of contamination at the AVX Property, clarification on the Human Health Risk Assessment, and the impact of the historical operations at the source areas on the drinking water supply for the City and Town of Olean. During the comment period from June 15, 2015 through July 15, 2015, one written comment was received from AVX relating to risks posed by the AVX Property. A copy of the written comment is provided as Attachment 5 to Appendix V. A summary of significant comments made, as well as the EPA's responses to those comments, are provided in the Responsiveness Summary (**Appendix V**).

11. PRINCIPAL THREAT WASTES

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a site whenever practicable (NCP Section 300.430(a)(1)(iii) (A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A

9 O&M costs presented for Alternative S-3 are total costs, instead of annual costs.

source material is material that includes or contains hazardous substances, pollutants, or contaminants, such as DNAPL in soil, that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment in the event exposure should occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described above. The manner in which principal threat wastes are addressed provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Varying concentrations of VOCs were detected in soil samples collected from borings installed within the main manufacturing building at the AVX Property. Results from the investigation showed concentrations of 1,1,1-TCA as high as 990 mg/kg and TCE as high as 650 mg/kg in subsurface soil, indicative of the presence of DNAPL in the soil zone at approximate depths of 16 feet and 6 feet, respectively, below the foundation of the main building. This concentration represents the highest concentration of TCE detected in soil at the AVX Property.

These findings show the presence of "principal threat" wastes at the AVX Property. The selected amended OU2 interim remedy is expected to contain this contamination through the use of an exposure barrier utilizing and maintaining existing surface covers (the building and paved areas in the northern Historical Source Area and the vegetative cover in the drainage swale area) and pumping of the AVX Property production well (PW-1). The selected amended OU2 interim remedy is also expected to extract and treat groundwater contamination that migrates in the Downgradient Till Unit through the use of a hydraulic trench along the southern portion of the AVX Property.

12. THE SELECTED REMEDY

12.1 Summary of the Rationale for the Selected Remedy

Based upon the requirements of CERCLA, the results of Site investigations, the detailed analysis of the alternatives, and public comments, the EPA has determined that Alternative S-2 for the Historical Source Area, Alternative DTGW-3 for the Downgradient Till Unit, and Alternative CAGW-2 for the City Aquifer best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621, and provide the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, 40 CFR §300.430(e)(9) until such time that a final remedy for the AVX Property is selected.

Additional multi-phase investigations conducted subsequent to the OU2 ROD revealed conditions at the AVX Property that were not known at the time of the issuance of the OU2 ROD. The excavation and removal of contaminated soil, a major component of the OU2 selected remedy, which commenced in 2000, was halted, due to contaminated soil extending beyond the area identified as contaminated in the OU2 ROD, to beneath the southeast corner of the manufacturing building. Results from the additional multi-phase investigations revealed and confirmed significant unknown contamination extending under the manufacturing building and that additional excavation and removal of all contaminated soil would result in significant disruption to and/or shutdown of the on-going operations. As a result, the EPA determined that the 1996 OU2

selected remedy for the AVX Property is not protective of human health and the environment, and determined that a modification to the AVX Property component of the OU2 ROD is necessary.

The No Action Alternatives S-1, DTGW-1, and CAGW-1 were not selected, because they are simply a baseline for comparison with other alternatives and are not protective of human health and the environment. Groundwater would continue to be impacted by contaminated soil for an indefinite period of time. The impacted groundwater would continue to contain COCs at concentrations that exceed federal MCLs and/or State standards. Although Alternatives S-3 and S-4 each contain a treatment component, they would provide only marginally greater protection than Alternative S-2, but at significantly greater cost to construct and implement, as they would provide a reduction of contamination volume, toxicity and mobility only in accessible areas of the Historical Source Area. Although Alternative DTGW-3 is more costly than Alternative DTGW-4 to construct and implement, it would provide significantly greater reduction in mobility, toxicity, and volume by treating all COCs at the AVX Property. Certain of the COCs at the AVX Property, namely, 1,2-DCA, toluene, xylenes, and acetone, would not be amenable to treatment by Alternative DTGW-4.

12.2 Description of the Selected Remedy

The major components of the amended remedy for the AVX Property include the following:

- Historical Source Area (Soil and Till Unit Groundwater): Maintenance of the exposure barrier utilizing existing surface covers (the building and paved areas in the northern portion of the Historical Source Area and the vegetative cover in the drainage swale area) to minimize leaching of volatile organic compounds (VOCs) from soil to groundwater and serve as a direct contact exposure barrier.

- Downgradient Till Unit (Groundwater): Construction and operation of a hydraulic trench containment system involving a gravel trench coupled with active groundwater recovery and treatment to prevent migration of groundwater downgradient of the AVX Property.

- City Aquifer (Groundwater): Hydraulic pumping containment utilizing and maintaining the existing AVX Property production well (PW-1) as an active groundwater recovery system at a pumping rate that prevents further migration of contaminated groundwater within the City Aquifer. An air stripper or carbon adsorption system or combination thereof will be added to the extraction system, as necessary to meet surface water discharge requirements.

- Implementation of institutional controls, including soil and groundwater use restrictions, to ensure the remedy remains protective.

- Development of a Site Management Plan (SMP) to provide for the proper management of the interim remedy post-construction, and to include long-term groundwater monitoring, periodic reviews and certifications. Until a final remedy is selected, the SMP will provide for the proper management of any contaminated unsaturated soil at the AVX Property and the evaluation of the potential for vapor intrusion at the existing building on the AVX Property and/or for any buildings constructed in the future, and mitigation, if necessary, in compliance with the SMP. The SMP will also provide for the proper implementation, management and maintenance of institutional controls.

A change in the current use of the building in the future will trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy.

• Implementation of a long-term groundwater monitoring program as part of the SMP to verify the effectiveness of the interim remedy, and to track and monitor changes in the groundwater contamination over time at the AVX Property. The long-term groundwater monitoring program will consist of a comprehensive monitoring network made up of existing monitoring wells and additional monitoring wells and piezometers on and off the AVX Property, within not only the City Aquifer but also within the till unit, and also monitoring to further evaluate geochemical conditions.

The environmental benefits of the selected remedy may be enhanced by employing design technologies and practices that are sustainable in accordance with the EPA Region 2's Clean and Green Energy Policy.[10]

As the amended OU2 remedy constitutes an interim remedy addressing soil and groundwater contamination at the AVX Property until such time in the future when the goal of the 1996 OU2 ROD of complete source removal and restoration can be achieved (i.e., a change in the use of the building in the future triggering the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy), contaminants will remain above levels that would allow for unrestricted use and unlimited exposure and, as such, use and exposure must be limited until performance standards are met. Statutory reviews, pursuant to Section 121(c) of CERCLA, will be conducted no less often than once every five years after the start of construction to ensure that the remedy is, or will be, protective of human health and environment. Because the selected remedy is an interim action, review of this remedy and the Site will be ongoing as the EPA develops the final remedy for the AVX Property.

12.3 Summary of Estimated Remedy Costs

The estimated capital, annual O&M, and total present-worth costs for the amended OU2 remedy for the AVX Property are discussed in detail in Appendices B, C, and D of the FS Report. The cost estimates are based on available information and are order-of-magnitude engineering cost estimates that are expected to be between +50 to -30 percent of the actual project cost. Changes to the cost estimates can occur as a result of new information and data collected during the design of the remedy.

A cost estimate summary for the selected remedy is presented in **Table 10** in **Appendix II**. The estimated capital, annual O&M, and total present-worth costs are presented below:

[10] http://epa.gov/region2/superfund/green_remediation.

Alternative	Capital & Periodic Cost	Annual O&M Cost	Present-Worth Cost
Historical Source Area			
S-2 - Exposure Barrier	$17,500	$30,000	$406,000
Downgradient Till Unit			
DTGW-3 - Hydraulic Trench Containment	$355,000	$125,000	$1,943,000
City Aquifer			
CAGW-2 - Hydraulic Pumping Containment	$26,000	$97,000	$1,228,000
Total	**$398,500**	**$252,000**	**$3,577,000**

12.4 Expected Outcomes of the Selected Remedy

The interim amended OU2 remedy actively addresses soil and groundwater contamination at the AVX Property. The results of the human health risk assessments indicate that the contaminated soil and groundwater at the AVX Property present an unacceptable exposure risk.

The contaminated soil below the building at the AVX Property does not necessarily present a direct-contact risk due to the depth of the soil and the fact that it is under the building. However, the contaminated soil, at significantly elevated concentrations, serves as source material for continued groundwater contamination and, therefore, it is necessary to address the soil contamination in relation to the groundwater remedy. The hydraulic trench containment for the Downgradient Till Unit will provide protection of human health and the environment by actively reducing contaminant concentrations prior to groundwater migration from the AVX Property and limiting exposure to contaminants through the implementation of institutional controls.

Under the selected OU2 amended remedy, the exposure barrier for the Historical Source Area Soil and Till Unit Groundwater, the hydraulic trench containment for the Downgradient Till Unit, and the hydraulic pumping containment for the City Aquifer will address and contain soil and groundwater contamination at the AVX Property until such time in the future when the goal of the 1996 OU2 ROD of complete source removal and restoration can be achieved. Subsequent actions will fully address the threats posed by conditions at the Site.

Remediation goals for the Contaminants of Concern at the AVX Property are presented in **Table 6 in Appendix II**.

13. STATUTORY DETERMINATIONS

Section 121(b)(1) of CERCLA mandates that a remedial action must be protective of human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment

or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at the Site. Section 121(d) of CERCLA further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to section 121(d)(4) of CERCLA. This interim remedy will ensure continued protectiveness of human health in the short term by preventing exposures to contaminated soil and groundwater at the AVX Property until such time as a final remedy is implemented.

In the 1996 ROD, the EPA indicated that complete source removal and groundwater restoration could be achieved. However, during the excavation of contaminated soil at the AVX Property, all of the contaminated soil could not be removed because the material extended beyond the area identified as contaminated in the OU2 ROD to beneath the southeast corner of the manufacturing building, which was fully occupied with AVX's manufacturing operations, which continue to this day. Further excavation had the potential to impact the structural integrity of the occupied building. As a result, the excavation area was backfilled pending further study. Further evaluations revealed significant unknown contamination extending under the building and that additional excavation and removal of all contaminated soil would result in significant disruption to and/or shutdown of the on-going operations. As a result, while the remedy identified in this ROD Amendment is protective of human health and the environment in the short term, groundwater at the Site cannot be fully restored until the source material below and adjacent to the building is addressed. A change in the current use of the building in the future would trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy for the AVX Property. Currently, groundwater restoration is one of the EPA's goals for the final remedy. This interim remedy will neither be inconsistent with, nor preclude, implementation of a final remedy for the AVX Property at the Site.

13.1 Protection of Human Health and the Environment

The amended OU2 remedy will protect human health and the environment because it will contain, and prevent exposure to, soil and groundwater contamination at the AVX Property. Protection will be achieved by addressing direct-contact soil exposure risks to human health, and by containing and preventing VOC contaminants already in the Downgradient Till Unit and the City Aquifer from migrating downgradient of the AVX Property. The required institutional controls will also assist in protecting human health over both the short- and long-term by helping to control and limit exposure to hazardous substances until a final remedy is selected for the AVX Property.

13.2 Compliance with ARARs

The selected amended OU2 remedy complies with chemical-specific, location-specific and action-specific ARARs that are relevant to the limited scope of this interim action. A complete list of the ARARs, TBCs and other guidelines for the selected remedy is presented in **Table 7** (chemical-specific), **Table 8** (location-specific) and **Table 9** (action-specific), which can be found in **Appendix II**.

13.3 Cost Effectiveness

A cost-effective remedy is one in which costs are proportional to the remedy's overall effectiveness (NCP Section 300.430(f)(1)(ii)(D)). The EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (*i.e.,* those that were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume though treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. For cost estimating purposes, the annual O&M costs were calculated using a 30-year estimated life of each alternative. The estimated present-worth cost for implementing the amended OU2 remedy for the AVX Property is $3,577,000.

The estimated present-worth cost of Alternative S-2, a remedial component of the amended OU2 remedy to address contaminated soil in the Historical Source Area, is $406,000, whereas the estimated present-worth of Alternative S-3 and S-4 is $3,306,000 and $1,988,000, respectively. Based on the comparison of overall effectiveness to cost, the amended OU2 remedy's Alternative S-2 meets the statutory requirement that Superfund remedies be cost-effective (NCP Section 300.430(f)(1)(ii)(D)) in that it is the least-cost action alternative. In addition, Alternatives S-3 and S-4 have limited long-term effectiveness and permanence in that they would only provide marginally greater protection than Alternative S-2 but at a significantly higher cost.

The estimated present-worth cost of Alternative DTGW-3, a remedial component of the amended OU2 remedy to address contaminated groundwater in the Downgradient Till Unit, is $1,943,000, whereas the estimated present-worth of Alternative DTGW-4 is $1,062,000. Based on the comparison of overall effectiveness to cost, the amended OU2 remedy's Alternative DTGW-3 meets the requirement that Superfund remedies be cost-effective (NCP Section 300.430(f)(1)(ii)(D)) in that, while it is more costly than Alternative DTGW-4, it provides a higher degree of long-term effectiveness and permanence due to Alternative DTGW-4's inability to treat several VOC contaminants known to be present at the AVX Property.

The estimated present-worth cost of Alternative CAGW-2, a remedial component of the amended OU2 remedy to address contaminated groundwater in the City Aquifer, is $1,228,000. Based on the comparison of overall effectiveness to cost, the amended OU2 remedy's Alternative CAGW-2 meets the requirement that Superfund remedies be cost-effective (NCP Section 300.430(f)(1)(ii)(D)) in that while it is more costly than Alternative CAGW-1, it provides a significantly higher degree of long-term effectiveness and permanence since no action would be performed under Alternative CAGW-1.

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

Although this interim action is not intended to fully address the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action does utilize treatment and

thus supports that statutory mandate. Because this action does not constitute the final remedy for the AVX Property, the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be addressed by the final response action. Subsequent actions will fully address the threats posed by conditions at the Site.

13.5 Preference for Treatment as a Principal Element

Because the interim amended OU2 remedy does not constitute the final remedy for the AVX Property, the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element, although partially addressed by the interim amended OU2 remedy, will be fully addressed by the final response action.

13.6 Five-Year Review Requirements

The interim amended OU2 remedy will result in hazardous substances, pollutants, or contaminants remaining at the AVX Property until remediation goals are attained, and as such, use and exposure must be limited until remediation goals are achieved. Since it will take more than five years to attain the remediation goals, statutory reviews pursuant to Section 121(c) of CERCLA will be conducted no less often than once every five years after the start of construction to ensure that the remedy is, or will be, protective of human health and environment. Because the amended OU2 remedy is an interim action, review of this remedy and the Site will be ongoing until the EPA develops the final remedy for the AVX Property.

14. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the AVX Property was released on June 15, 2015. The Proposed Plan identified Alternative S-2 for the Historical Source Area, Alternative DTGW-3 for the Downgradient Till Unit, and Alternative CAGW-2 for the City Aquifer as the preferred interim remedy to minimize, contain and/or eliminate the migration of contaminants in soil and groundwater and to minimize any potential future health and environmental impacts from the AVX Property until such time as a final remedy is implemented.

The EPA reviewed all written (including electronic formats such as e-mail) and oral comments submitted during the public comment period and has determined that no significant changes to the remedy, as originally identified in the Proposed Plan, are necessary or appropriate.

Appendix I

Figures

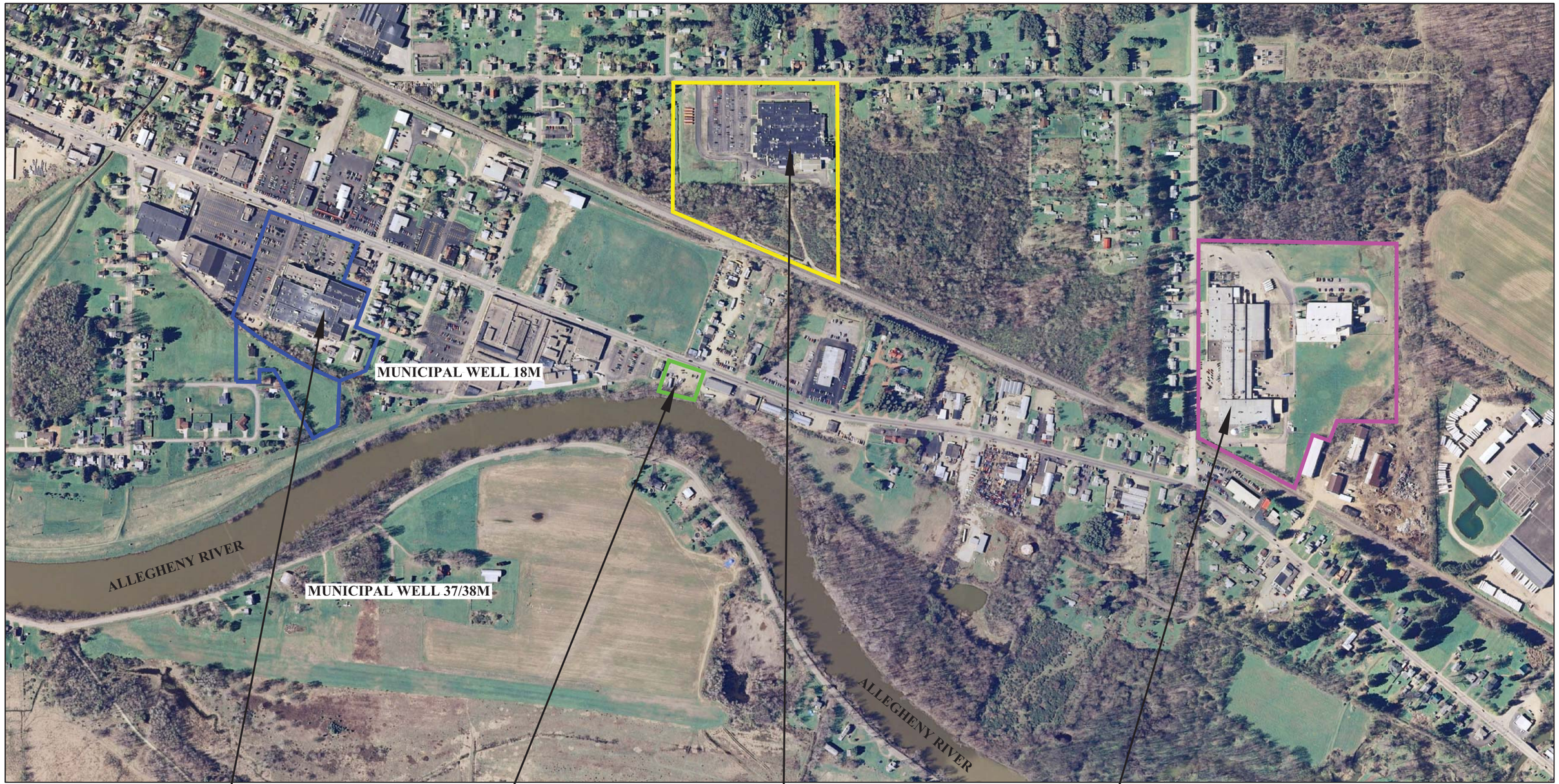
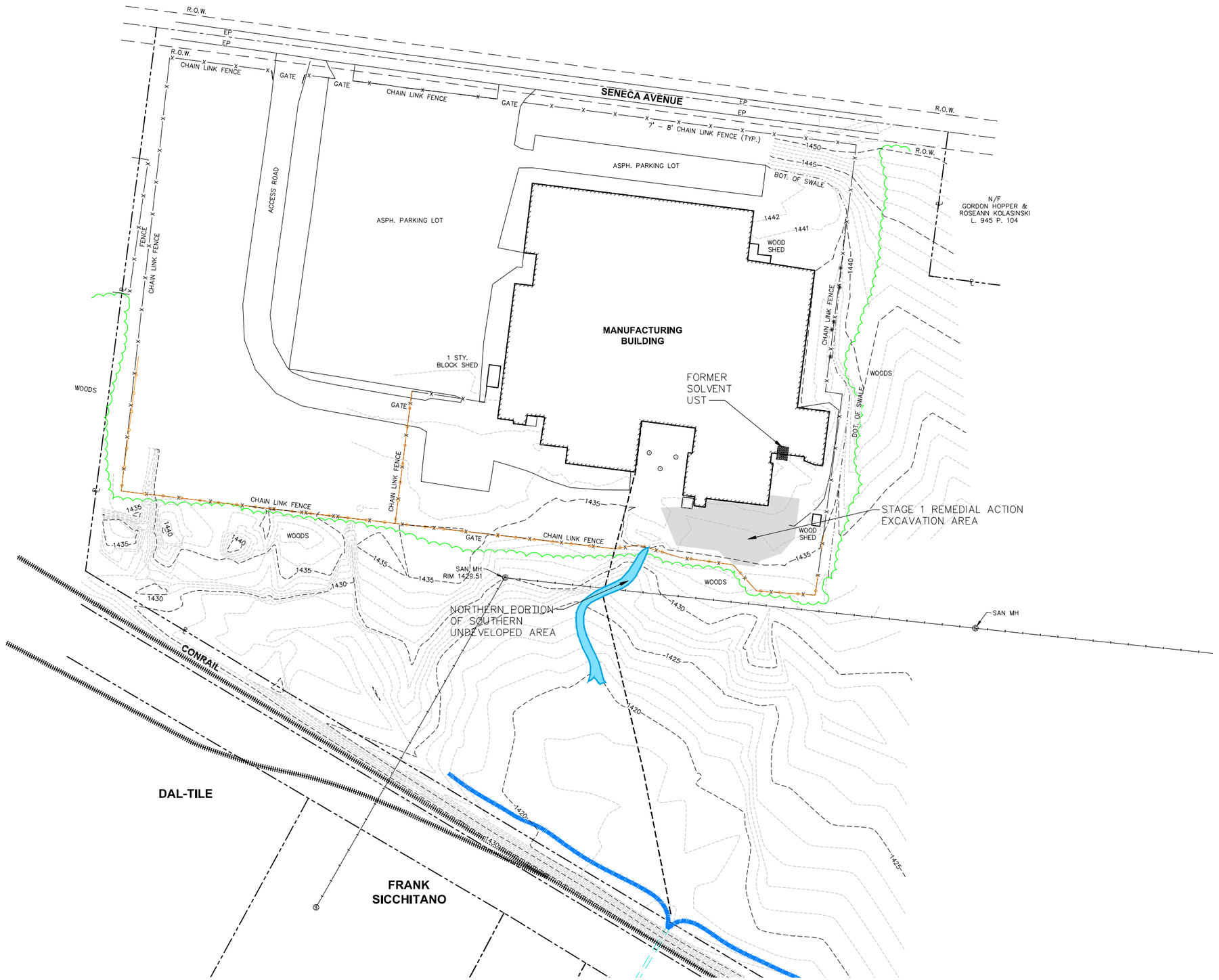


FIGURE 1

SITE LOCATION MAP

OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

DRAWN BY:	DATE:	PROJ. NO.
MWW	09/24/2014	137-196



LEGEND:

- UTILITY POLE
- BENCHMARK
- INVERT OF CULVERT PASSING BENEATH RAILROAD TRACKS
- PROPERTY BOUNDARY
- SANITARY SEWER LINE
- SPDES DISCHARGE PIPE
- APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK EXCAVATION
- STAGE 1 REMEDIAL ACTION EXCAVATION AREA
- SWALE
- UNNAMED CREEK

NOTES:

1. PROPERTY LINE (JANUARY 13, 1981), SANITARY SEWER LINE (OCTOBER 2003), TOPOGRAPHIC CONTOURS (SOUTH OF FACILITY FENCE) (OCTOBER 2004), AND SPDES DISCHARGE PIPE (FEBRUARY 2, 2005) LOCATIONS OBTAINED FROM SURVEY MAPS PREPARED BY D. MICHAEL CANADA ON THE CORRESPONDING DATES.
2. BOUNDARIES OF PROPERTIES TO THE SOUTH OF THE NORFOLK SOUTHERN RAIL LINE ARE FROM OLEAN TAX MAPS AND ARE APPROXIMATE.
3. BASE MAP IS POSITIONED IN THE STATE PLANE COORDINATE SYSTEM, NAD 83, WEST ZONE.

0 60' 120'
GRAPHIC SCALE

AVX CORPORATION
OLEAN, NEW YORK

AVX Facility Layout

ARCADIS

FIGURE
2

CITY: Syracuse DIV/GROUP: EnvCAD DB: A.Schilling, A.Schilling, W.JONES LD:A.Schilling PIC: W.Popham PM/TM: M.Hanish LYR: ON=*;OFF=REF; (FRZ)
G:\ENVCAD\SYRACUSE\ACTIB\007385\0001\000330\DWG\007385B01.DWG LAYOUT: X SAVED: 6/10/2015 12:03 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ----
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07385X01
07385X06
07385XDL

Appendix II

Tables

TABLE 1
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: AVX Surface and Subsurface Soil
Exposure Medium: Surface and subsurface soil

Exposure Point	Chemical of Concern	Concentration Detected OU2 ROD (mg/kg)		Concentration Detected Under AVX Building (mg/kg)	
		Min	Max	Min	Max
Surface and Subsurface Soil	1,1- dichloroethane	0.005	2.2	0.063	0.8
	1,1,1-trichloroethene	0.054	1,300	0.063	990
	1,1-dichloroethene	3.7	3.7	0.063	55
	1,2-dichloroethane	0.002	0.047	0.063	ND
	Chloroethane	-----	-----	0.063	0.024
	Cis-1,2-dichloroethene	-----	-----	0.063	65
	Tetrachloroethene	0.003	270	0.057	270
	Toluene	0.003	16	0.057	460
	Trans-1,2-dichloroethene	-----	-----	0.063	ND
	Trichloroethene	0.003	500	0.024	650
	Vinyl chloride	-----	-----	0.06	0.6
	Xylene	0.012	4	0.0072	315

Scenario Timeframe: Current/Future
Medium: AVX Shallow Groundwater
Exposure Medium: Tap water

Exposure Point	Chemical of Concern	Concentration Detected OU2 ROD (ppb)		Concentration Detected in Groundwater – AVX (ppb)	
		Min	Max	Min	Max
Tap Water	1,1,1-trichloroethane	4	360,000	0.003	348,000
	1,1-dichloroethane	0.9	26,000	0.001	28,300
	1,1-dichloroethene	0.9	16,000	0.0012	27,000
	1,2-dichloroethane	1	1	0.0013	131
	Chloroethane	-----	-----	0.002	7,000
	Cis-1,2-dichloroethene	2	3,200	0.001	170,000
	Tetrachloroethene	0.7	14,000	0.0011	55,000
	Toluene	0.7	96	0.0013	39,000
	Trans-1,2-dichloroethene	1	3	0.001	550
	Trichloroethene	0.5	110,000	0.001	320,000
	Vinyl chloride	1	25	0.001	17,000
	Xylene	0.9	3,900	0.0054	5,000

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the minimum and maximum detected concentrations of the chemicals of concern (COCs) for each of the COCs detected in surface/subsurface soil and groundwater.

TABLE 2
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Surface and Subsurface Soil	On-site soil (AVX)	Worker	Adult	Ingestion/Dermal/Inhalation	Quant/Qual	Current or future adult workers could be exposed to on-site soil.
	Groundwater	Tap Water	Groundwater under AVX	Resident	Adult	Ingestion/Dermal/Inhalation	Quant/Qual	Current or future residents could hypothetically be exposed to groundwater.
				Resident	Young Child	Ingestion/Dermal/Inhalation	Quant/Qual	
				Residents	Older Child	Ingestion/Dermal/Inhalation	Quant/Qual	

Quant/Qual = Quantitative and qualitative risk analysis performed.

Summary of Selection of Exposure Pathways

The table describes the exposure pathways associated with the soil and groundwater that were evaluated for the risk assessment, to support the OU2 ROD and the 2015 ROD Amendment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral RfD (OU2)	Units	Oral RfD (Current)	Units	Estimated Hazard Higher/Lower
1,1,1-trichloroethane	9.0E-01	mg/kg-day	2.0E+00	mg/kg-day	Lower
1,1-dichloroethane	1.0E+00	mg/kg-day	2.0E-01	mg/kg-day	Higher
1,1-dichloroethene	9.0E-03	mg/kg-day	5.0E-02	mg/kg-day	Lower
1,2-dichloroethane	-----	-----	6.0E-03	mg/kg-day	Higher
Chloroethane	-----	-----	-----	-----	-----
Cis-1,2-dichloroethene	1.0E-02	mg/kg-day	2.0E-03	mg/kg-day	Higher
Tetrachloroethene	1.0E-01	mg/kg-day	6.0E-03	mg/kg-day	Higher
Toluene	2.0E+00	mg/kg-day	8.0E-02	mg/kg-day	Higher
Trans-1,2-dichloroethene	1.7E-02	mg/kg-day	2.0E-02	mg/kg-day	Lower
Trichloroethene	------	------	5.0E-04	mg/kg-day	Higher
Vinyl chloride	------	------	3.0E-03	mg/kg-day	Higher
Xylene	4.0E+00	mg/kg-day	2.0E-01	mg/kg-day	Higher

Pathway: Inhalation

Chemical of Concern	Inhalation RfC (OU2)	Units	Inhalation RfC (Current)	Units	Estimated Hazard Higher/Lower
1,1,1-trichloroethane	------	------	5.0E+00	mg/m^3	Higher
1,1-dichloroethane	5.0E+00	mg/m^3	------	------	Lower
1,1-dichloroethene	------	------	2.0E-01	mg/m^3	Higher
1,2-dichloroethane	-----	-----	7.0E-03	mg/m^3	Higher
Chloroethane	-----	-----	1.0E+01	mg/m^3	Higher
Cis-1,2-dichloroethene	------	------	------	------	------
Trans-1,2-dichloroethene	-----	-----	-----	-----	-----
Tetrachloroethene	------	------	4.0E-02	mg/m^3	Higher
Toluene	2.0E+00	mg/m^3	5.0E+00	mg/m^3	Lower
Trichloroethene	------	------	2.0E-03	mg/m^3	Higher
Vinyl chloride	------	------	1.0E-01	mg/m^3	Higher
Xylene	------	------	1.0E-01	mg/m^3	Higher

Summary of Toxicity Assessment

This table provides non-carcinogenic hazard information which is relevant to the contaminants of concern in soil and groundwater. The last column identifies if the hazard index would be higher (increased hazard) or lower (decreased hazard) if the hazards were recalculated.

TABLE 4

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor (OU2)	Units	Oral Cancer Slope Factor (Current)	Units	Risk Estimate Higher/Lower
1,1,1-trichloroethane	------	------	------	------	------
1,1-dichloroethane	------	------	5.7E-03	mg/kg-day	Higher
1,1-dichloroethene	6.0E-01	mg/kg-day	------	------	Lower
1,2-dichloroethane	9.1E-02	mg/kg-day	9.1E-02	mg/kg-day	Same
Chloroethane	-----	-----	-----	-----	-----
Cis-1,2-dichloroethene	------	------	------	------	------
Tetrachloroethene	5.32E-02	mg/kg-day	2.1E-03	mg/kg-day	Lower
Trans-1,2-dichloroethene	-----	-----	-----	-----	-----
Toluene	------	------	------	------	------
Trichloroethene	1.1E-02	mg/kg-day	4.6E-02	mg/kg-day	Higher
Vinyl chloride	1.9E+00	mg/kg-day	7.2E-01	mg/kg-day	Lower
Xylene	------	------	------	------	------

Pathway: Inhalation

Chemical of Concern	Unit Risk (OU2)	Units	Unit Risk (Current)	Units	Risk Estimate Higher/Lower
1,1,1-trichloroethane	------	------	------	------	------
1,1-dichloroethane	------	------	1.6E-06	ug/m^3	Higher
1,1-dichloroethene	5.0E-05	ug/m^3	------	------	Lower
1,2-dichloroethane	2.6E-05	ug/m^3	2.6E-05	ug/m^3	Same
Chloroethane	-----	-----	-----	-----	-----
Cis-1,2-dichloroethene	------	------	------	------	------
Tetrachloroethene	5.7E-07	ug/m^3	2.6E-07	ug/m^3	Lower
Trans-1,2-dichloroethene	-----	-----	-----	-----	-----
Toluene	------	------	------	------	------
Trichloroethene	1.7E-06	ug/m^3	4.1E-06	ug/m^3	Higher
Vinyl chloride	8.4E-05	ug/m^3	4.4E-06	ug/m^3	Lower
Xylene	------	------	------	------	------

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in soil and groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure. The last column identifies if the risk would be higher (increased risk) or lower (decreased risk) if the hazards were recalculated.

TABLE 5

Risk Characterization Summary – Carcinogens and Noncarcinogens

Scenario Timeframe: Current/Future
Medium: Tap Water

Receptor	Carcinogenic Risk				Non-Carcinogenic Hazard			
	Ingestion	**Dermal**	**Inhalation**	**Cancer Risk Total**	**Ingestion**	**Dermal**	**Inhalation**	**Hazard Index Total**
Adult Resident	1.5E-02	2.4E-03	6.4E-05	**1.73E-02**	3.4	0.14	0.00162	**3.4**
Young Child Resident	1.3E-02	9.2E-04	6.0E-05	**1.39E-02**	14.7	0.273	0.0755	**14.7**
Older Child Resident	5.94E-03	6.7E-04	2.7E-05	**6.64E-03**	6.7	0.198	0.0345	**6.7**

Scenario Timeframe: Current/Future
Medium: Surface and subsurface soil

Receptor	Carcinogenic Risk				Non-Carcinogenic Hazard			
	Ingestion	**Dermal**	**Inhalation**	**Cancer Risk Total**	**Ingestion**	**Dermal**	**Inhalation**	**Hazard Index Total**
Adult Construction Worker	4.97E-05	-----	2.32E-08	4.97E-05	0.502	------	0.0512	0.507

Summary of Risk Characterization – Carcinogens and Non-Carcinogens

The table presents cancer risks and non-cancer hazards for each route of exposure for groundwater and soil, which was presented in the OU2 ROD. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}. The NCP also indicates that the acceptable non-cancer hazard index is 1.

The primary contaminants in groundwater are 1,1,1-trichloroethene, trichloroethene, cis-1,2-dichloroethene, tetrachloroethene and toluene and surface/subsurface soil are 1,1,1-trichloroethene, trichloroethene, toluene, xylene, tetrachloroethene and cis-1,2-dichloroethane. Concentrations detected in groundwater and surface/subsurface soil on the AVX property are higher than the concentrations reported in the OU2 ROD, thus a qualitative evaluation found that the risks and hazards would be similar or greater than those presented in the OU2 ROD. Since risks were above 10-4, hazards exceed a value 1, and the federal MCLs were exceeded, a remedial action is warranted.

Table 6

Remediation Goals for Chemicals of Concern

Remediation Goals for Groundwater				
Chemicals of Concern (COCs)	NYS Groundwater Quality Standards[1] (µg/L)	NYSDOH Drinking Water Quality Standards[2] (µg/L)	National Primary Drinking Water Standards[3] (µg/L)	Cleanup Level[4]
cis-1,2 DCE	5	5	70	5
trans-1,2-DCE	5	5	100	5
1,2-DCA	5	5	5	5
1,1,1-TCA	5	5	5	5
TCE	5	5	5	5
Toluene	1,000	1,000	1,000	1,000
PCE	5	5	5	5
Vinyl Chloride	2	2	2	2
Xylene	5	5	10,000	5

Remediation Goals for Soil	
Chemicals of Concern (COCs)	Soil Remediation Goals[5] (mg/kg)
cis-1,2 DCE	0.25
trans-1,2-DCE	0.19
1,2-DCA	0.02
1,1,1-TCA	0.68
TCE	0.47
Toluene	0.7
PCE	1.3
Vinyl Chloride	0.02
Xylene	1.6

Notes:

1. New York Surface Water and Ground Water Quality Standards (6NYCRR Part 703), February 16, 2008.
2. New York State Department of Health Drinking Water Standards (10NYCRR Part 5), September 2007.
3. EPA National Primary Drinking Water Standards (web page), EPA 816-F-09-004, May 2009.
4. The Remediation Goals are selected based on NYS Groundwater Quality Standards, or NYSDOH Drinking Water Standards when groundwater quality standards are not available.
5. New York State Department of Environmental Conservation soil cleanup objectives (6 NYCRR Sections 375-6.4(b)(3) and 375-6.5)

NYSDOH = New York State Department of Health.
µg/L = micrograms per liter
mg/kg = milligrams/kilogram

Table 7
Chemical-specific ARARs, TBCs, and other Guidelines

Regulatory Level	Regulatory Authority and Citation	Requirement Synopsis
Federal	National Primary Drinking Water Standards-Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) (42 U.S.C. § 300f et seq. and 40 CFR Part 141, Subpart F)	Establishes health-based standards for public drinking water systems. Also establishes drinking water quality goals set at levels at which no adverse health effects are anticipated, with an adequate margin of safety.
State	NYSDOH Drinking Water Standards (10 NYCRR Part 5)	Sets MCLs for public drinking water supplies.
State	NYS Environmental Remediation Program Soil Cleanup Objectives (6 NYCRR Section 375-6.4(b)(3) and 375-6.5)	Establishes standards for soil cleanups.
State	NYSDEC Commissioner Policy 51 (CP-51/Soil Cleanup Guidance)	Provides the framework and procedures for the selection of soil cleanup levels appropriate for each of the remedial programs.
State	NYS Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 NYCRR Part 703)	Establishes numerical standards for groundwater and surface water cleanups.

Table 8
Location-Specific ARARs, TBCs, and other Guidelines

Regulatory Level	Citation	Requirement Synopsis
Federal	National Historic Preservation Act (16 U.S.C. §470 et seq. and 36 CFR Part 800) Endangered Species Act (16 U.S.C. §1531-1544)	Establishes procedures to provide for preservation of historical and archeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federal licensed activity or program.
Federal	Endangered Species Act (16 U.S.C. §1531 et seq., 50 CFR Part 200)	Requires that the continued existence of any endangered or threatened species and/or its habitat not be impacted by a federal activity.
Federal	Clean Water Act Section 404; 40 CFR Part 230; 33 CFR Part 320-330	Prohibits discharge into wetlands.
Federal	National Environmental Policy Act (NEPA); 40 CFR Part 6 Appendix A § 4.	Provides procedures for floodplain management and wetlands protection.
Federal	National Environmental Policy Act (NEPA); 40 CFR 6.302(b)(2005)	Regulates activities within a floodplain.
State	Endangered and Threatened Species of Fish and Wildlife (6 NYCRR Part 182)	Provides standards for the protection of threatened and endangered species.
State	Freshwater Wetlands; 6 NYCRR 663-665j	Establishes permitting, mapping and classification, and local government and land use requirements for freshwater wetlands.
State	Floodplain Management; 6 NYCRR 500	Describes development permitting requirements for areas in floodplains.
State	Use and Protection of Waters; 6 NYCRR 608	Regulates the use and protection of waters.
State	Wild, Scenic, and Recreational Rivers; 6 NYCRR	Provides regulations for the administration and management of the wild, scenic and recreations rivers system in New York State.
State	Floodplains; 6 NYCRR 502	Provides floodplain management criteria for State projects.

Table 9
Action-specific ARARs, TBCs and other Guidelines

Regulatory Level	Regulatory Authority and Citation	Required Synopsis
General Requirement for Site Remediation		
Federal	OSHA[1] - Record keeping, Reporting, and Related Regulations (29 CFR 1904)	Outlines the record keeping and reporting requirements for an employer under OSHA.
Federal	OSHA – General Industry Standards (29 CFR 1910)	Specifies an 8-hour time-weighted average concentration for worker exposure to various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 1910.120.
Federal	OSHA – Construction Industry Standards (29 CFR 1926)	Specifies the type of safety equipment and procedures to be followed during site remediation.
Federal	RCRA[2] Identification and Listing of Hazardous Wastes (40 CFR 261)	Describes methods for identifying hazardous wastes and lists known hazardous wastes.
Federal	RCRA Standards Applicable to Generators of Hazardous Wastes (40 CFR 262)	Describes standards applicable to generators of hazardous wastes.
Federal	RCRA – Preparedness and Prevention (40 CFR 264.30 – 264.31)	Outlines the requirements for safety equipment and spill control.
Federal	RCRA – Contingency Plan and Emergency Procedures (40 CFR 264.50 – 264.56)	Outlines the requirements for emergency procedures to be used following explosions, fires, etc.
State	New York Hazardous Waste Management System – General (6 NYCRR Part 370)	Provides definition of terms and general standards applicable to hazardous waste management systems.
State	New York Identification and Listing of Hazardous Waste (6 NYCRR Part 371)	Describes methods for identifying hazardous wastes and lists known hazardous wastes.
State	New York Hazardous Management Facilities (6 NYCRR Part 373)	Regulates treatment, storage, and disposal of hazardous wastes.
State	New York Management of Specific Hazardous Waste (6 NYCRR Part 374)	Establishes standards for the management of specific hazardous wastes.
State	New York Environmental Remediation Programs (6 NYCRR Part 375)	Identifies process for investigation and remedial action at state funded Registry site; provides exception from NYSDEC permits.
State	New York Solid Waste Management Regulations (6 NYCRR 360)	Sets standards and criteria for all solid waste management facilities, including design, construction, operation, and closure requirements for municipal solid waste landfills.
Waste Transportation		
Federal	DOT[3] Rules for Transportation of Hazardous Materials (49 CFR Parts 107, 171, 172, 177 to 179)	Outlines procedures for the packaging, labeling, manifesting, and transporting of hazardous materials.
Federal	RCRA Standards Applicable to Transporters of Hazardous Waste (4 CFR 263)	Establishes standards for hazardous waste transporters.
State	New York Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (6 NYCRR Part 372)	Establishes record keeping requirements and standards related to the manifest system for hazardous wastes.
State	New York Waste Transporter Permit Program (6 NYCRR Part 364)	Establishes permit requirements for transportation of regulated waste.
Disposal		
Federal	RCRA Land Disposal Restrictions (40 CFR 268)	Identifies hazardous wastes restricted from land disposal and provides treatment standards under which an otherwise prohibited waste may be land disposed.

State	New York Standards for Universal Waste (6 NYCRR Part 374-3) and Land Disposal Restrictions (6 NYCRR Part 376)	Establishes standards for the treatment and disposal of hazardous wastes.
Groundwater Discharge		
Federal	CWA[4] (40 CFR 122, 125)	Provides NPDES[5] permit requirements for point source discharges, including the NPDES Best Management Practice Program. These regulations include, but are not limited to, requirements for compliance with water quality standards, a discharge monitoring system, and records maintenance.
Federal	CWA - Federal Ambient Water Quality Criteria and Guidance Values (40 CFR 131.36)	Establishes criteria for surface water quality based on toxicity to aquatic organisms and human health.
Federal	Safe Drinking Water Act – Underground Injection Control Program (40 CFR 144, 146)	Establishes performance standards, well requirements, and permitting requirements for groundwater re-injection wells.
State	New York SPDES[6] Regulations (6 NYCRR Parts 750 – 757)	Governs the discharge of any wastes into or adjacent to State waters that may alter the physical, chemical, or biological properties of State waters, except as authorized pursuant to a NPDES or State permit.
State	New York Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 NYCRR Part 703)	Establishes numerical criteria for groundwater treatment before discharge.
State	New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS[7] 1.1.1)	Provides groundwater effluent limitations for use where there are no standards.
Off-Gas Management		
Federal	CAA[8] – NAAQs[9] (40 CFR 50)	Provides air quality standards for pollutants including particulate matter, lead, NO2, SO2, CO, and ozone.
State	New York Air Quality Standards/DER-10 (6 NYCRR Part 257)	Provides time-weighted concentrations for particulate matter during excavation activities.
State	New York (DAR-1) Air Guide 1, Guidelines for the Control of Toxic Ambient Contaminants	Provides guidance for the control of toxic ambient air contaminants and outlines the procedures for evaluating sources.
State	New York Permits and Certificates (6 NYCRR Part 201)	Allows for permits to be exempted for listed trivial activities.
State	New York Emissions Verification (6 NYCRR Part 202)	Specifies the sampling and documentation requirements for off-gas emissions.
State	New York General Prohibitions (6 NYCRR Part 211)	Provides prohibitions which apply to any particulate, fume, gas, mist, odor, smoke, vapor, pollen, toxic or deleterious emissions.
State	New York General Process Emission Sources (6 NYCRR Part 212)	Sets the treatment requirements for certain emission rates.

1 OSHA – Occupational Safety and Health Administration
2 RCRA – Resource Conservation and Recovery Act
3 DOT – Department of Transportation
4 CWA - Clean Water Act
5 NPDES – National Pollutant Discharge Elimination System
6 SPDES – State Pollution Discharge Elimination System
7 TOGS – Technical and Operational Guidance Series
8 CAA – Clean Air Act
9 NAAQS – National Ambient Air Quality Standards

Table 10 - Cost Estimate Summary for the Selected Remedy

Alternative S-2 - Exposure Barrier	
Capital Costs	
Limited Soil Sampling Program and Report	
Sampling Program Project Management and Labor	$4,771
Sampling Program Subcontractors and Expenses	$12,716
Subtotal Capital Costs	**$17,487**
Periodic Costs	
Well Abandonment	
Well Abandonment Project Management and Labor	$14,026
Well Abandonment Subcontractors and Expenses	$7,220
Asphalt Cap Periodic Cost (once every 5 years)	
Asphalt Cap Project Management and Labor	$31,524
Asphalt Cap Subcontractors and Expenses	$16,926
Subtotal Periodic Costs	**$69,696**
Total Capital & Periodic Costs	**$87,183**
Operations & Maintenance Costs	
Vegetative Cover Maintenance (30 years)	$218,100
Long-Term Monitoring (30 years)	$672,200
Total Operations & Maintenance Costs	**$890,300**
Total Project Cost	**$977,483**
Present Worth Cost (7% Discount)	**$406,000**

Table 10 - Cost Estimate Summary for the Selected Remedy

Alternative DTGW-3 - Hydraulic Trench Containment	
Capital Costs	
Hydraulic Containment Work Plan	$31,200
System Installation and Testing	
Management, Design, and Planning	$44,691
Mobilization and Site Prep	$17,273
Trench Installation	$48,316
Treatment System	$180,288
Waste Disposal	$12,700
Site Restoration	$10,500
Hydraulic Containment Construction Report	$10,400
Subtotal Capital Costs	**$355,367**
Periodic Costs	
Well Abandonment	
Well Abandonment Project Management and Labor	$20,230
Well Abandonment Subcontractors and Expenses	$25,600
Contingency Monitoring Well Installation	
Well Installation Project Management and Labor	$10,065
Well Installation Subcontractors and Expenses	$18,494
Subtotal Periodic Costs	**$74,388**
Total Capital & Periodic Costs	**$429,755**
Operations & Maintenance Costs	
Institutional Controls - Deed Restriction (30 years)	$241,100
Annual Monitoring Report (30 years)	$236,600
Semi-Annual Groundwater and Surface Water Monitoring (30 years)	$958,900
Hydraulic Containment System O&M (30 years)	$2,328,500
Total Operations & Maintenance Costs	**$3,765,100**
Total Project Cost	**$4,194,855**
Present Worth Cost (7% Discount)	**$1,943,000**

Table 10 - Cost Estimate Summary for the Selected Remedy

Alternative CAGW-2 - Hydraulic Pumping Containment	
Capital Costs	
Contingency Monitoring Well Installation	
Management, Design, and Planning	$8,936
Mobilization and Site Prep	$3,900
Well Installation	$10,701
Waste Disposal	$2,450
Subtotal Capital Costs	**$25,987**
Periodic Costs	
Well Abandonment	
Well Abandonment Project Management and Labor	$20,230
Well Abandonment Subcontractors and Expenses	$25,600
Subtotal Periodic Costs	**$45,830**
Total Capital & Periodic Costs	**$71,817**
Operations & Maintenance Costs	
Semi-Annual Groundwater Monitoring (30 years)	$949,900
Hydraulic Containment System O&M (30 years)	$1,950,500
Total Operations & Maintenance Costs	**$2,900,400**
Total Project Cost	**$2,972,217**
Present Worth Cost (7% Discount)	**$1,228,000**

Appendix III

Administrative Record Index

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

09/30/2015 **REGION ID: 02**

Site Name: OLEAN WELL FIELD
CERCLIS ID: NYD980528657
OUID: 02
SSID: 0216
Action: OU2 ROD AMENDMENT - AVX PROPERTY

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name:	Addressee Organization:	Author Name:	Author Organization:
319291	09/30/2015	ADMINISTRATIVE RECORD INDEX FOR OU2 - AVX ROD AMENDMENT FOR THE OLEAN WELL FIELD SITE	11	[AR INDEX]	[]	[]	[,]	[US ENVIRONMENTAL PROTECTION AGENCY]
300260	03/01/1999	FINAL REMEDIAL DESIGN / REMEDIAL ACTION WORK PLAN FOR OU2 FOR THE OLEAN WELL FIELD SITE	59	[PLAN]	[,]	[AVX CORPORATION]	[,]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
300261	03/01/1999	APPENDICES A - E OF THE FINAL REMEDIAL DESIGN / REMEDIAL ACTION WORK PLAN FOR OU2 FOR THE OLEAN WELL FIELD SITE	436	[PLAN]	[,]	[AVX CORPORATION]	[,]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
300259	03/31/1999	TRANSMITTAL OF THE FINAL REMEDIAL DESIGN / REMEDIAL ACTION WORK PLAN FOR OU2 FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[HUGHES, DAMIEN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[POPHAM, WILLIAM B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
122681	04/01/2001	STAGE 1 REMEDIAL ACTION REPORT VOLUME I FOR THE OLEAN WELL FIELD SITE	131	[REPORT]	[]	[]	[,]	[BLASLAND, BOUCK & LEE, INCORPORATED]
122682	04/01/2001	STAGE 1 REMEDIAL ACTION REPORT VOLUME II FOR THE OLEAN WELL FIELD SITE	833	[REPORT]	[]	[]	[,]	[BLASLAND, BOUCK & LEE, INCORPORATED]
297695	04/09/2001	TRANSMITTAL OF STAGE 1 REMEDIAL ACTION REPORT FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[WEIDER, MARK F]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297696	07/13/2001	US EPA'S TECHNICAL REVIEW OF THE STAGE 1 REMEDIAL ACTION REPORT AND THE SUPPLEMENTAL REMEDIAL DESIGN WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	5	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297697	10/17/2001	US EPA'S TECHNICAL REVIEW OF THE REVISED STAGE 1 REMEDIAL ACTION REPORT AND THE SUPPLEMENTAL REMEDIAL DESIGN WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]

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297698	11/14/2001	APPROVAL OF THE SUPPLEMENTAL REMEDIAL DESIGN WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	1	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297699	05/15/2002	TRANSMITTAL OF PUMP TEST REPORT DOCUMENTING THE EFFECTIVENESS OF THE AVX PRODUCTION WELL IN CONTROLLING GROUNDWATER CONTAMINANTS AT THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[WEIDER, MARK F]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297700	08/13/2002	TECHNICAL REVIEW AND COMMENTS OF THE PUMP TEST REPORT FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[TACCONE, THOMAS]	[US ENVIRONMENTAL PROTECTION AGENCY]
297701	09/17/2002	RESPONSE TO TECHNICAL REVIEW AND COMMENTS ON THE PUMP TEST REPORT FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	32	[LETTER]	[TACCONE, THOMAS]	[US ENVIRONMENTAL PROTECTION AGENCY]	[WEIDER, MARK F]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297702	12/04/2002	US EPA'S RESPONSE TO COMMENTS AND TECHNICAL REVIEW ON THE PUMP TEST REPORT FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
300258	03/04/2003	GROUNDWATER SAMPLING EVENT NO. 13 FOR THE OLEAN WELL FIELD SITE	268	[REPORT]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
122688	03/12/2003	CORRESPONDENCE REGARDING QUARTERLY GROUNDWATER SAMPLING EVENT NO. 10 FOR OLEAN WELL FIELD SITE	126	[REPORT]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]

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297704	05/01/2003	TRANSMITTAL OF WORK PLAN FOR WELL INSTALLATION - DEVELOPMENT - ABANDONMENT - SAMPLING AND REPORTING FOR THE OLEAN WELL FIELD SITE	7	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297703	05/09/2003	EVALUATION OF GROUNDWATER CONTAINMENT EFFECTIVENESS AND EXPECTED GROUNDWATER COLLECTION TRENCH EFFECTIVENESS FOR THE OLEAN WELL FIELD SITE	13	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297705	08/15/2003	REQUEST FOR APPROVAL OF REDUCTION IN GROUNDWATER SAMPLING FREQUENCY AND USE OF PASSIVE DIFFUSION BAG SAMPLERS FOR THE POST REMEDIATION GROUNDWATER MONITORING PROGRAM FOR THE OLEAN WELL FIELD SITE	5	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297706	12/08/2003	US EPA'S RESPONSE TO THE AVX CORPORATION'S LETTERS DATED 05/09/2003 AND 08/15/2003 FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297707	01/09/2004	RESPONSE TO THE US EPA'S COMMENT LETTER DATED 12/08/2003 FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297709	05/19/2004	SUMMARY OF 04/15/2004 MEETING FOR AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	9	[MEETING MINUTES]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
265563	11/11/2004	WORK PLAN FOR GROUNDWATER INVESTIGATION REGARDING THE GEOPROBE INVESTIGATION, AND GROUNDWATER MONITORING WELL INSTALLATION, AND SAMPLING PROGRAM FOR THE OLEAN WELLFIELD SITE	5	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[]	[]

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297708	11/23/2004	APPROVAL OF GROUNDWATER INVESTIGATION WORK PLAN DATED 11/11/2004 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297710	12/03/2004	COMMENTS TO 11/23/2004 APPROVAL OF GROUNDWATER INVESTIGATION WORK PLAN DATED 11/11/2004 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	4	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
298077	04/14/2005	EPA APPROVAL OF REQUEST TO SUSPEND MONITORING OF NATURAL ATTENUATION GROUNDWATER PARAMETERS AT THE AVX PROPERTY FOR THE OLEAN WELL FIELD SITE	1	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
319269	04/22/2005	GROUNDWATER INVESTIGATION REPORT - AVX-17S AREA FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	96	[REPORT]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
319276	04/22/2005	TRANSMITTAL OF THE GROUNDWATER INVESTIGATION REPORT - AVX-17S AREA FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297711	06/09/2005	TECHNICAL REVIEW OF THE GROUNDWATER INVESTIGATION REPORT FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297712	12/23/2005	US EPA'S COMMENTS ON GROUNDWATER INVESTIGATION WORK PLAN DATED 09/22/2005 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]

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DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name:	Addressee Organization:	Author Name:	Author Organization:
297713	01/27/2006	RESPONSE TO US EPA'S COMMENTS ON GROUNDWATER INVESTIGATION WORK PLAN DATED 09/22/2005 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	5	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297714	03/03/2006	CORRESPONDENCE REGARDING GROUNDWATER INVESTIGATION WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297715	03/23/2006	REVISION 1 TO GROUNDWATER INVESTIGATION WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	11	[PLAN]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297716	04/18/2006	APPROVAL OF GROUNDWATER INVESTIGATION WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297718	09/01/2006	GROUNDWATER INVESTIGATION AND SAMPLING EVENT NO.18 REPORT FOR THE OLEAN WELL FIELD SITE	110	[REPORT]	[,]	[AVX CORPORATION]	[,]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297717	09/08/2006	TRANSMITTAL OF GROUNDWATER INVESTIGATION AND SAMPLING EVENT NO.18 REPORT FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
319268	09/08/2006	GROUNDWATER INVESTIGATION AND SAMPLING EVENT NO. 18 REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	290	[REPORT]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]
319275	09/08/2006	TRANSMITTAL OF THE GROUNDWATER INVESTIGATION AND SAMPLING EVENT NO. 18 REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]

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297719	01/25/2007	REQUEST FOR REMEDY REVIEW WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297720	01/25/2007	US EPA'S COMMENTS ON GROUNDWATER INVESTIGATION WORK PLAN DATED 12/28/2006 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297721	02/09/2007	REMEDY REVIEW AND COMMENTS TO GROUNDWATER INVESTIGATION WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	5	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297722	03/30/2007	LIST OF POTENTIAL TECHNICAL ALTERNATIVES FOR EVALUATION DURING A REMEDY REVIEW FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297723	05/22/2007	CORRESPONDENCE REGARDING SCREENING OF TECHNICAL ALTERNATIVES FOR EVALUATION DURING A REMEDY REVIEW FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297724	06/08/2007	RESPONSE TO US EPA COMMENTS TO SCREENING OF TECHNICAL ALTERNATIVES FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297725	06/25/2007	APPROVAL OF THE GROUNDWATER INVESTIGATION WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]

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297726	07/10/2007	CORRESPONDENCE REGARDING THE PLACEMENT OF AN ADDITIONAL UPPER-CITY AQUIFER MONITORING WELL TO THE EAST OF MONITORING WELL CW-9 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	1	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
298078	02/07/2008	SUBMITTAL OF WORK PLAN ADDENDUM FOR GROUNDWATER INVESTIGATION FOR THE OLEAN WELL FIELD SITE	4	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]
319270	08/08/2008	ON- AND OFF-SITE GROUNDWATER INVESTIGATION AND SAMPLING EVENT NO. 22 REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	1432	[REPORT]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]
319277	08/08/2008	TRANSMITTAL OF THE ON- AND OFF-SITE GROUNDWATER INVESTIGATION AND SAMPLING EVENT NO. 22 REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	1	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]
298080	01/15/2009	TRANSMITTAL OF GROUNDWATER VOLATILE ORGANIC CONCENTRATION COMPILATION MAPS FOR THE OLEAN WELL FIELD SITE	6	[FORM]	[SCORCA, MICHAEL , WALTERS, MICHAEL]	[U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 2, US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]
297727	03/05/2009	COMMENTS ON THE ON / OFF-SITE GROUNDWATER INVESTIGATION AND SAMPLING EVENT N0. 22 REPORT DATED 08/2008 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	4	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]

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297728	04/20/2009	DRAFT RESPONSE TO US EPA'S 03/05/2009 COMMENTS ON THE ON / OFF-SITE GROUNDWATER INVESTIGATION AND SAMPLING EVENT N0. 22 REPORT DATED 08/2008 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	29	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297729	05/01/2009	RESPONSE TO US EPA'S 03/05/2009 COMMENTS ON THE ON / OFF-SITE GROUNDWATER INVESTIGATION AND SAMPLING EVENT N0. 22 REPORT DATED 08/2008 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	11	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297730	06/10/2009	UPDATE ON SCREENING OF FEASIBILITY STUDY REMEDIAL ALTERNATIVES FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	25	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297731	09/24/2009	US EPA'S COMMENTS ON UPDATE OF SCREENING OF FEASIBILITY STUDY REMEDIAL ALTERNATIVES FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	4	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
298083	10/27/2009	RESPONSES TO EPA'S 09/24/2009 COMMENT LETTER TO THE TECHNICAL REVIEW OF THE SCREENING OF FEASIBILITY STUDY REMEDIAL ALTERNATIVES REPORT AVX CORPORATION FOR THE OLEAN WELL FIELD SITE	16	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]

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298084	11/24/2009	EPA COMMENTS ON THE TECHNICAL REVIEW OF THE SCREENING OF FEASIBILITY STUDY REMEDIAL ALTERNATIVES REPORT AVX CORPORATION FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
350140	03/01/2010	EPA COMMENTS ON THE FEASIBILITY STUDY WORK PLAN FOR THE AVX PROPERTY FOR THE OLEAN WELL FIELD SITE	4	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297732	03/16/2010	ARCADIS'S RESPONSES TO US EPA'S 03/01/2010 COMMENT LETTER TO THE FEASIBILITY STUDY WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	352	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
298085	06/21/2010	EPA COMMENTS ON THE TECHNICAL REVIEW OF THE FEASIBILITY STUDY WORK PLAN FOR THE AVX PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]
297733	07/19/2010	ARCADIS'S RESPONSES TO US EPA'S 06/21/2010 COMMENT LETTER TO THE FEASIBILITY STUDY WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	8	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297734	10/01/2010	FOLLOW-UP TO 09/20/2010 CONFERENCE CALL REGARDING FEASIBILITY STUDY WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	9	[LETTER]	[LYNCH, KEVIN]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297735	10/12/2010	RESPONSE TO THE ARCADIS'S LETTER DATED 10/01/2010 REGARDING FEASIBILITY STUDY WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[HENRY, SHERREL D]	[US ENVIRONMENTAL PROTECTION AGENCY]

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297736	11/10/2010	APPROVAL OF THE FEASIBILITY STUDY WORK PLAN FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[HENRY, SHERREL D]	[US ENVIRONMENTAL PROTECTION AGENCY]
297738	06/04/2012	US EPA'S COMMENTS ON DRAFT FEASIBILITY STUDY REPORT DATED 12/2011 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	8	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[MANNINO, PETER]	[US ENVIRONMENTAL PROTECTION AGENCY]
297739	07/16/2012	US EPA'S TECHNICAL REVIEW OF THE FEASIBILITY STUDY INVESTIGATION REPORT DATED 12/2011 FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[BLUE, LARRY]	[AVX CORPORATION]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]
297740	07/20/2012	ARCADIS'S MONITORED NATURAL ATTENUATION SCREENING ANALYSIS IN RESPONSE TO EPA'S COMMENT 26 TO THE FEASIBILITY STUDY REPORT FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	16	[LETTER]	[MANNINO, PETER]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
297741	09/11/2012	RESPONSE TO EPA'S COMMENTS TO THE FEASIBILITY STUDY REPORT FOR THE AVX CORPORATION PROPERTY FOR THE OLEAN WELL FIELD SITE	25	[LETTER]	[MANNINO, PETER]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK B]	[BBL ENVIRONMENTAL SERVICES INCORPORATED]
319272	01/29/2013	FEASIBILITY STUDY INVESTIGATION REPORT REVISED 01/2013 FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	2197	[REPORT]	[,]	[AVX CORPORATION]	[COBB, MICHAEL , HANISH, MARK , POPHAM, WILLIAM B]	[ARCADIS]
319278	01/29/2013	RESPONSES TO COMMENTS AND TRANSMITTAL OF THE FEASIBILITY STUDY INVESTIGATION REPORT REVISED 01/2013 FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	6	[LETTER]	[WALTERS, MICHAEL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]

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319266	01/22/2015	TRANSMITTAL OF AVX'S SUGGESTED REVISIONS TO EPA'S PROPOSED REVISIONS TO THE REVISED FINAL FEASIBILITY STUDY REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	1	[E MAIL MESSAGE]	[HANISH, MARK]	[ARCADIS]	[THANTU, LORENZO]	[US ENVIRONMENTAL PROTECTION AGENCY]
319267	01/22/2015	AVX'S SUGGESTED REVISIONS TO EPA'S PROPOSED REVISIONS TO THE REVISED FINAL FEASIBILITY STUDY REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	8	[E MAIL MESSAGE]	[HANISH, MARK]	[ARCADIS]	[THANTU, LORENZO]	[US ENVIRONMENTAL PROTECTION AGENCY]
319260	02/04/2015	REVISED FINAL FEASIBILITY STUDY REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	1711	[REPORT]	[,]	[AVX CORPORATION]	[HANISH, MARK , NELSON, DENICE , POPHAM, WILLIAM B]	[ARCADIS]
319265	02/04/2015	TRANSMITTAL OF THE REVISED FEASIBILITY STUDY REPORT FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	2	[LETTER]	[MANNINO, PIETRO]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]
319274	02/26/2015	GROUNDWATER SAMPLING EVENT REPORT NO. 35 FOR OU2 - AVX FOR THE OLEAN WELL FIELD SITE	134	[REPORT]	[THANTU, LORENZO]	[US ENVIRONMENTAL PROTECTION AGENCY]	[HANISH, MARK]	[ARCADIS]
318416	06/10/2015	CORRESPONDENCE REGARDING AVX PROPERTY BASELINE RISK ASSESSMENT FOR OU2 FOR THE OLEAN WELL FIELD SITE	3	[LETTER]	[]	[]	[MANNINO, PIETRO]	[US ENVIRONMENTAL PROTECTION AGENCY]
350141	6/11/2015	PROPOSED PLAN FOR OU2 - AVX PROPERTY FOR THE OLEAN WELL FIELD SITE	23	[PLAN]	[]	[US ENVIRONMENTAL PROTECTION AGENCY]	[]	[]
351461	09/30/2015	MEMORANDUM REGARDING REVISION OF CERTAIN RESPONSE COSTS FOR THE ROD AMENDMENT FOR OU2 - AVX PROPERTY FOR THE OLEAN WELL FIELD SITE	3	[MEMORANDUM]	[]	[]	[MANNINO, PIETRO]	[US ENVIRONMENTAL PROTECTION AGENCY]

Appendix IV

New York State Concurrence Letter

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Office of the Director
625 Broadway, 12th Floor, Albany, New York 12233-7011
P: (518) 402-9706 | F: (518) 402-9020
www.dec.ny.gov

SENT VIA EMAIL ONLY September 29, 2015

Mr. Walter E. Mugdan, Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region 2
290 Broadway, Floor 19
New York, New York 10007-1866

RE: Olean Well Field; TCE Contamination
Superfund Site (AVX)
Site No. 905014
OU-2 Record of Decision (ROD) Amendment
New York State Concurrence

Dear Mr. Mugdan:

The New York State Department of Environmental Conservation and Department of Health have reviewed the Amendment to the Operable Unit 2 Record of Decision for the Olean Well Field Superfund Site, Related to the AVX Property (dated September 2015) (Amendment). We understand the Amendment selects a modified interim remedy to contain soil and groundwater contamination at the AVX property.

Based on the results of a Supplemental Remedial Investigation/Feasibility Study, EPA issued a ROD for OU-2 on September 30, 1996. The original remedy selected for the AVX property included:

- Excavation and removal of contaminated soil;
- Off-site low temperature desorption of soil contaminants, if necessary;
- Upgradient and downgradient groundwater monitoring;
- Implementation of groundwater treatment, if excavation and removal of the contaminated soil did not adequately improve the quality of the City Aquifer and if the property continued to affect the groundwater entering the municipal wells; and

- Implementation of groundwater use restrictions determine that the current system could not remediate all the contaminated soil to meet intended remedial goals.

This Amendment serves to document the EPA's decision to implement a contingency remedy for the AVX property area requiring:

- Maintenance of exposure barrier utilizing existing surface covers;
- Construction and operation of a groundwater collection trench coupled with active groundwater recovery and treatment;
- Hydraulic groundwater containment utilizing the existing PW-1 production well;
- Implementation of institutional controls;
- Development of a Site Management Plan (SMP); and
- Implementation of a long-term groundwater monitoring program as part of the SMP.

With this understanding, we concur with the Amendment to the selected remedy for the Olean Well Field Superfund Site as it pertains to the AVX Property.

If you have any questions or need additional information, please contact Mr. Maurice Moore, the project manager for this site at (716) 851-7220, or by email at maurice.moore@dec.ny.gov

Sincerely,

Robert W. Schick, P.E.
Director
Division of Environmental Remediation

ec: Pietro Mannino, EPA
Lorenzo Thantu, EPA
Krista Anders, DOH
Charlotte Bethoney, DOH
Albert DeMarco, DOH
Michael Cruden, DEC
Chad Staniszewski, DEC
Maurice Moore, DEC

Appendix V

Responsiveness Summary

APPENDIX V

RESPONSIVENESS SUMMARY

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Appendix V - Attachment 1	Proposed Plan
Appendix V - Attachment 2	Public Notice - Commencement of Public Comment Period
Appendix V - Attachment 3	June 23, 2015 Public Meeting Sign-In Sheets
Appendix V - Attachment 4	June 23, 2015 Public Meeting Transcript
Appendix V - Attachment 5	Written Comments Submitted During Public Comment Period

INTRODUCTION

A responsiveness summary is required by the regulations promulgated under the Superfund statute. It provides a summary of comments received during the public comment period, as well as the responses of the U.S. Environmental Protection Agency (EPA) to those comments. All comments received were considered by EPA in its final Record of Decision (ROD) regarding the selection of the second operable unit (OU2) amended remedy for the AVX Property at the Olean Well Field Superfund Site (Site).

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The Proposed Plan for the OU2 amended remedy for the AVX Property, attached hereto as Attachment 1, was released to the public on June 15, 2015, along with the January 29, 2013 Feasibility Study Investigation (FSI) Report and the February 4, 2015, Feasibility Study (FS) Report, as well as other documents contained in the Administrative Record. EPA's preferred remedy and the basis for that preference were identified in the Proposed Plan.

These documents, including the Proposed Plan, and others, were made available to the public in information repositories maintained at EPA Superfund Records Center in the Region 2 offices located at 290 Broadway, 18th Floor, New York, New York, and the Olean Public Library, located at Second Street and Laurens Street, Olean, New York.

A notice that announced the commencement of the public comment period, the public meeting date, a description of the preferred remedy, EPA contact information, and the availability of the above-referenced documents, attached hereto as Attachment 2, was published in *The Olean Times Herald*, a local newspaper, on June 15, 2015. The public comment period ended on July 15, 2015.

EPA held a public meeting on June 23, 2015 at 7:00 P.M. at the Jamestown Community College Cutco Theatre, 260 North Union Street, Olean, New York, to discuss the findings of the FS Report and to answer questions from the public about the remedial alternatives and the proposed remedy. Copies of the public meeting sign-in sheets and a transcript of the meeting are attached hereto as Attachments 3 and 4, respectively. Responses to the comments and questions received at the public meeting, along with other written comments received during the public comment period, are included in this Responsiveness Summary.

SUMMARY OF COMMENTS AND EPA RESPONSES

One written comment was received during the public comment period from AVX Corporation (AVX). A copy of the comment is provided in Attachment 5 of this Responsiveness Summary. A summary of this written comment and the comments provided at the public meeting on June 23, 2015, as well as EPA's responses to those comments, are provided below.

Comment # 1: AVX commented that the Risk Summary section of the Proposed Plan includes statements regarding the risk assessment for the AVX Property, or "Source Area," that are misleading and requested that the statements be clarified.

The comment specifically refers to language contained in the Proposed Plan describing the baseline risk assessment conducted for the 1996 OU2 ROD and the statement that the risk assessment results have not substantially changed based on the data since that ROD. The

commenter states that conditions at the AVX Property have changed since the issuance of the OU2 ROD in 1996 and that EPA's reliance on the risk assessment conducted prior to the issuance of the OU2 ROD in 1996, without further clarification, implies that nothing has been done to remediate the AVX Property since that time. The commenter notes that the soil excavation conducted in 2000 and the extraction of groundwater by the pumping of the AVX Property production well (PW-1) has removed a mass of the contaminants of concern that would lead to a reduction in contaminants of concern mass and a reduction in potential risk. Therefore, the Proposed Plan should clearly acknowledge the two beneficial developments within the AVX Property.

The commenter then states that the AVX Property is isolated from the other source areas at the Site. As such, risks related to the AVX Property differ from risks within other source areas at the Site. As a result, the commenter requests that EPA acknowledge that 1) contaminants of concern within the City Aquifer beneath the AVX Property have been and are currently being contained by the pumping of groundwater from PW-1 and therefore the risks stated in the Proposed Plan, specific to the broader OU2, overstate both past and current risks within the boundaries of the AVX Property; 2) due to the pumping of PW-1, it is highly unlikely that groundwater within the City Aquifer in other areas of the Site that are subject to current or future withdrawal and use by the City or others, contain contaminants of concern that originated from within the boundaries of the AVX Property; and 3) since contaminants of concern in soil within the AVX Property are largely capped by asphalt or buildings, the potential for leaching of contaminants of concern to groundwater is thereby limited. Finally, the commenter states that any contaminants of concern that have or may continue to leach to groundwater beneath the AVX Property are contained by the continuous pumping of PW-1. Therefore, statements in the Proposed Plan regarding unacceptable risks related to contaminants of concern in soil within OU2 do not directly apply to any source on the AVX Property.

Response to Comment # 1: It should be noted that the comment letter refers to the AVX Property and/or the AVX Source Area. The OU2 ROD Amendment addresses only the AVX Property and, as such, references in the comments are assumed to be referring to the AVX Property as that term is used in the OU2 ROD Amendment.

Although the Risk Summary section of the Proposed Plan does not discuss the excavation activities conducted in 2000 pursuant to the OU2 ROD issued in 1996 nor the extraction of groundwater through the pumping of PW-1, these activities are described elsewhere in the Proposed Plan. The soil excavation activities are described in the Site Background section and the operation of the production well to extract groundwater from the City Aquifer is described in the Unknown Conditions or New Information Related to AVX Property section of the Proposed Plan.

Although EPA acknowledges that these activities have resulted in a reduction of the contaminant mass in soil at the AVX Property, the contamination discussed in the risk section is the contamination that remains today and is under and adjacent to the AVX building, which was not addressed through previous activities at the AVX Property. The concentrations of chemicals detected under the AVX building were compared to the concentrations utilized in preparation of the baseline risk assessment performed for the OU2 ROD (see Table 1 in Appendix II of this OU2 ROD Amendment for the AVX Property). Similar or higher concentrations were found under the AVX building. Thus, EPA concluded that an action to address the contamination under the

building is warranted. EPA's statement that the results of the risk assessment have not substantially changed refers to the fact that the OU2 ROD indicates that an action was needed, and likewise, based on concentrations detected after the OU2 ROD was issued, a current action, called for in this OU2 ROD Amendment for the AVX Property, is needed to address the soils under the AVX building.

It should be noted that the baseline risk assessment for the OU2 ROD in 1996 evaluated exposure to untreated groundwater for the four source areas collectively. As part of EPA's assessment of the risks posed by the AVX Property, EPA looked at the analytical data presented in the January 29, 2013, FSI Report for the AVX Property, which shows that each contaminant of concern detected at the AVX Property exceeds federal maximum contaminant levels (MCLs) and State standards. EPA has determined that the AVX Property continues to require remediation for the remedy to be protective. Refer to Table 1 in Appendix II of this ROD Amendment for a comparison of the maximum concentrations of contaminants detected in groundwater during the OU2 RI at the Site to the maximum concentrations detected at the AVX Property subsequent to the issuance of the OU2 ROD.

EPA also disagrees with the commenter regarding the relationship between groundwater contamination attributed to the AVX Property and within the City Aquifer. As stated in the Site Background and Scope and Role of Action sections of the Proposed Plan, although the Till Unit has very low vertical permeability, monitoring well sampling results indicate that some volatile organic compound (VOC) contamination has moved vertically downward into the City Aquifer. Information provided to EPA by AVX indicates that the pumping rates of PW-1 have varied over time. As such, the commenter's statement concerning groundwater containment at the AVX Property is not accurate. As noted in the Proposed Plan, the preferred alternative (CAGW-2) requires continuous pumping at PW-1 at 300-400 gallons per minute and the collection of data to ensure that hydraulic containment in the City Aquifer at the AVX Property is being achieved. Also, while surface covers such as asphalt and the building are intended to minimize the potential leaching of VOC contamination from soil to groundwater, the comment does not consider that, absent implementation of a remedial alternative for groundwater in the Downgradient Till Unit, soil and groundwater contamination within the Historical Source Area[1] could serve as source material for continued groundwater contamination into the City Aquifer. The potential for migration of groundwater contamination beyond the AVX Property and further impact to the City Aquifer beyond the control of PW-1 will be assessed during monitoring of the remedy. In addition,

EPA is in the process of conducting the remedial investigation/feasibility study for OU4, which is the area downgradient of the AVX Property. Information gathered from the OU4 investigation is expected to further inform the relationship between the AVX Property and the Site.

Therefore, the qualitative analysis of the data conducted as part of the remedy modification process appropriately assesses the risks associated with the VOC contamination in soil and groundwater at the AVX Property subsequent to the issuance of the 1996 OU2 ROD.

[1] For purposes of this OU2 ROD Amendment and the February 4, 2015, FS Report for the AVX Property, the Historical Source Area generally consists of soil contamination and groundwater contamination in the Till Unit beneath the manufacturing building and the land at the southeast corner of the building immediately proximate thereto, including the shallow north-south trending drainage swale that begins to the south of the building.

Comment # 2: Two commenters expressed concern that wildlife activity in their neighborhood has significantly diminished over the years. The commenters asked whether the contamination at the AVX Property might be the cause.

Response to Comment # 2: There is no indication that contamination at the AVX Property has resulted in a decrease in wildlife activity in the area. As part of the OU2 remedial investigation for the AVX Property, a qualitative ecological risk assessment was conducted to determine whether contamination present at the AVX Property was impacting the wooded or wetland area located along the southern portion of the property. Based on the results of this evaluation, it was determined that there is not a completed exposure pathway from the AVX Property to the wooded or wetland areas.

Nevertheless, as a result of the concern raised by these commenters, on June 29, 2015, a representative of the Cattaraugus County Health Department (CCHD) conducted a walk-through of the neighborhood near the Site. During the walk-through, three deer were observed and no adverse impacts to wildlife were identified.

In addition, the remedial investigation for OU4, which is located to the south of the AVX property and the railroad tracks, will also include an ecological risk assessment for the area comprising OU4.

Comment # 3: A commenter expressed concern that his private well water may be contaminated as a result of the Olean Well Field Superfund Site.

Response to Comment # 3: In recognition of the commenter's concern, on June 29, 2015, the CCHD collected a sample of the tap water from the commenter's residence. The analytical results did not reveal any detections of volatile organic compounds. A copy of the results have been provided to the commenter.

Comment # 4: A commenter expressed concern about the impact of the groundwater contamination on his home.

Response to Comment # 4: EPA investigates the soil vapor intrusion pathway at homes and buildings situated at Superfund sites when the potential for intrusion of vapors emanating from groundwater contamination exists. In April 2009, EPA initiated a vapor intrusion sampling program at homes and buildings within close proximity to the AVX Property. Based on EPA's investigation thus far, including recent sampling conducted in April 2015, EPA has determined that the vapor-intrusion pathway does not constitute a significant risk to human health. In addition, the commenter's residence is situated upgradient of the AVX Property contamination. Therefore, it does not appear that contamination related to the AVX Property or the Olean Well Field Site as a whole could result in vapor intrusion within the residence. Nevertheless, EPA intends to perform additional vapor intrusion sampling between November 2015 and April 2016 and will include the commenter's home in the sampling event at that time, assuming access is permitted by the homeowner.

Appendix V – Attachment 1

Proposed Plan

Superfund Proposed Plan for Remedy Modification

Olean Well Field Superfund Site
AVX Property
Cattaraugus County, New York

EPA
United States
Environmental Protection
Agency

June 2015

EPA ANNOUNCES PROPOSED PLAN FOR REMEDY MODIFICATION FOR THE AVX PROPERTY; A SOURCE OF CONTAMINATION TO THE OLEAN WELL FIELD SUPERFUND SITE

The remedy selected in a September 1996 Record of Decision (ROD) for Operable Unit 2 (OU2) at the Olean Well Field Superfund Site (Site) addressed the sources of volatile organic compound (VOC) contamination to groundwater at the Site. The four source areas targeted in the OU2 ROD were as follows: AVX Corporation (AVX) (currently owned by AVX and located at 1695 Seneca Avenue, Olean, New York), Alcas Cutlery Corporation (Alcas) (currently owned and operated by Cutco Corporation and located at 1116 East State Street, Olean, New York); Loohn's Dry Cleaners and Launderers (Loohns) (currently a vacant lot located at 1713 East State Street, Olean, New York); and McGraw-Edison Company (McGraw) (currently operated by Cooper Power Systems, LLC, owned by Cooper Power Systems, Inc., and located at 1648 Dugan Road, Olean, New York). This Proposed Plan for Remedy Modification (Proposed Plan) modifies the OU2 ROD for the contamination relating to AVX only. For purposes of this remedy modification, the AVX Property includes the facility at which AVX conducts electronic components manufacturing operations. The major components of the selected remedy in the OU2 ROD for the AVX Property included the excavation and off-Site treatment and disposal of contaminated soil; upgradient and downgradient groundwater monitoring and implementation of groundwater use restrictions. The selected remedy set forth in the OU2 ROD for the AVX Property also included the implementation of groundwater treatment, if excavation and removal of the contaminated soil did not adequately improve the quality of the City Aquifer (described further below) and if the property continued to affect the groundwater entering the municipal wells. The results of additional evaluations performed by AVX, a potentially responsible party (PRP), after the implementation of soil excavation activities pursuant to the OU2 ROD, revealed that contaminated soils, which are serving as a continuing source of groundwater contamination to the Till Unit (described further below) and the City Aquifer, extend underneath the manufacturing facility at the AVX Property. The remedy modification proposed herein for the AVX Property is necessary because further evaluations revealed that additional excavation and removal of all contaminated soil beneath the manufacturing building would result in significant disruption to and shutdown of on-going manufacturing operations at the AVX Property. To avoid this disruption, EPA is proposing in this document an interim remedy to contain soil and groundwater contamination at the AVX Property until such time in the future when the goal of the OU2 ROD of complete source removal and restoration can be achieved. Specifically, a change in the current use of the building in the future would trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy.

In accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA, also known as Superfund) 42 U.S.C. §9617(a), and Section 300.435(c) (2) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), if after the selection of a remedy in a ROD, a component is fundamentally altered, EPA must propose an amendment to the ROD. EPA's proposed changes to the ROD must be made available for public comment in a Proposed Plan.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
June 15, 2015 – July 15, 2015

EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: June 23, 2015 at 7:00PM
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Focused Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Jamestown Community College, Cattaraugus County Campus, Cutco Theater, 260 North Union Street, Olean, New York.

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This Superfund Proposed Plan describes the proposed changes to the AVX Property component of the OU2 remedy and identifies the preferred modified interim remedy with the rationale for this preference. This Proposed Plan was developed by EPA, the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of CERCLA, as amended, and Sections 300.430(f) and 300.435(c) of the NCP.

The nature and extent of the contamination at the AVX Property and the alternatives summarized in this Proposed Plan are further described in the January 29, 2013 Feasibility Study Investigation (FSI) Report and the February 4, 2015 Feasibility Study (FS) Report, respectively. The January 29, 2013 FSI Report and the February 4, 2015 FS Report, as well as other documents, are contained in the Administrative Record for the OU2 ROD and the Administrative Record Update for this remedy modification. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

This Proposed Plan is being provided as a supplement to the above-noted documents to inform the public of EPA's preferred remedy modification and to solicit public comments pertaining to the remedial alternatives evaluated for the AVX Property. The selected remedy components set forth in the OU2 ROD for the Loohns and McGraw properties are not being modified in this document. In September 2014, EPA amended the OU2 ROD to modify the selected remedy for the Alcas source area component of the OU2 ROD, addressing soil and groundwater contamination impacting the underlying aquifers at the Alcas Facility, and also selected a remedy to address groundwater contamination at an area south of the Alcas Facility referred to as Parcel B, and identified as OU3 of the Site.

The preferred remedy for the AVX Property described further below includes: an exposure barrier consisting of concrete, asphalt, and soil for the Historical Source Area[1]; hydraulic containment and treatment of contaminated groundwater in the downgradient Till Unit; extraction of contaminated groundwater in the City Aquifer for containment; and institutional controls.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the FSI Report, FS Report and this Proposed Plan have been made available to the public for a public comment period which begins on June 15, 2015, and concludes on July 15, 2015.

Changes to the preferred modified interim remedial alternative discussed in this document, or a change from the preferred modified interim remedial alternative to another remedial alternative, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected amendment to the AVX Property portion of the OU2 ROD will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in this Proposed Plan and in the detailed analysis section of the February 4, 2015 FS Report because EPA may select a remedy other than the preferred modified interim remedy.

A public meeting will be held during the public comment period at the Cutco Theater located at the Jamestown Community College, Cattaraugus County Campus on June 23, 2015, at 7:00 p.m. to present the conclusions of the studies performed at the AVX Property, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments submitted during the public comment period, will be documented in the Responsiveness Summary Section of the ROD Amendment, the document which will formalize the selection of the modified remedy.

Written comments on the Proposed Plan should be addressed to:

Lorenzo Thantu
Remedial Project Manager
Western New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telephone: (212) 637-4240
E-mail: thantu.lorenzo@epa.gov

[1] For purposes of this Proposed Plan and the FS, the Historical Source Area generally consists of soil contamination and groundwater contamination in the Till Unit beneath the manufacturing building and the land at the southeast corner of the building immediately proximate thereto, including the shallow north-south trending drainage swale that begins to the south of the building. (see **Figure 2**)

INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Olean Public Library, located at Second and Laurens Streets
Olean, New York
(716) 372-0200

Hours: Monday – Thursday, 9:00 AM – 9:00 PM
Friday and Saturday, 9:00 AM – 5:00 PM

EPA – Region 2
Superfund Records Center
290 Broadway, 18th Floor
New York, New York
(212) 637-4308
Hours: Monday – Friday: 9:00 AM – 5:00 PM

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases or operable units (OUs) so that remediation of different environmental media or areas of a site can proceed separately. EPA has designated four OUs for the Olean Well Field Site. On September 24, 1985, EPA signed a ROD for OU1, which called for, among other things, the treatment of the municipal supply well water and the extension of the public water supply to residents utilizing private wells. This Proposed Plan does not propose to modify the selected remedy for OU1. As discussed above, on September 30, 1996, EPA signed the ROD for OU2 which targeted four source areas for remediation. OU3 addresses groundwater contamination relating to the Alcas source area that migrated beyond the Alcas facility to Parcel B, which is located south of the Alcas facility. On September 30, 2014, EPA amended the OU2 ROD to modify the selected remedy for the Alcas component of the OU2 ROD. The Alcas OU2 ROD Amendment addressed soil and groundwater contamination impacting the underlying aquifers, and also selected a remedy to address OU3 groundwater contamination. EPA has established a fourth operable unit at the Site (OU4) to address VOC contamination in groundwater located downgradient of the AVX Property and south of the Conrail rail road tracks. EPA is in the process of conducting a remedial investigation and feasibility study (RI/FS) for OU4. This Proposed Plan modifies the selected remedy for the AVX Property component of the OU2 ROD which addresses soil and groundwater contamination impacting the underlying aquifers at the AVX Property.

EPA uses interim actions to address areas or contaminated media, such as groundwater, that ultimately may be included in the final record of decision for a site. Interim actions include actions to institute temporary measures to stabilize a site or operable unit and/or prevent further migration of contaminants or further environmental degradation until such time as a final remedial decision is issued.

As stated above, this remedy modification is an interim action. The primary objectives of this interim action are to minimize, contain and/or eliminate the migration of contaminants in soil and groundwater and to minimize any potential future health and environmental impacts from the AVX Property until such time as a final remedy is implemented. This interim remedy will be consistent with, and will not preclude, implementation of a final remedy at the AVX Property.

SITE BACKGROUND

Site Description

The Site is located in the eastern portion of the City of Olean and west and northwest of the towns of Olean and Portville in Cattaraugus County, New York. The Site is characterized by contaminated groundwater underlying the City of Olean, the Town of Olean and the Town of Portville, and by contaminated soil at certain locations in the City and Town of Olean. The Site is approximately 65 miles southeast of Buffalo, New York, and seven miles north of the New York/Pennsylvania border. The Allegheny River, a principal tributary of the Ohio River, and two of its tributaries, the Olean and Haskell Creeks, flow west-northwest through the southern portion of the Site.

A Site location map is provided as **Figure 1**.

Site Geology and Hydrogeology

The Olean Well Field is underlain by approximately 300 feet of unconsolidated glacial deposits. Previous groundwater investigations in the Olean Well Field have shown that the upper 100 feet of glacial deposits can be divided into five lithologic units based on color, texture, grain size and mode of deposition. These lithologic units have been grouped in topographically descending order into four hydrogeologic units referred to as the upper aquifer, upper aquitard, lower aquifer, and lower aquitard.

The upper aquifer is comprised of glaciofluvial coarse sands and sandy gravels, recent fluvial deposits of fine sands, and silts with some clay. The upper aquifer is not continuous at the Olean Well Field Site. The thickest portion of the upper aquifer (approximately 41 feet) is found along the Allegheny River. The upper aquifer thins to the north, pinching out just south of the AVX Property. The upper aquifer is recharged by the infiltration of precipitation. Groundwater in the upper aquifer is

generally encountered at a depth of approximately 12 to 15 feet below land surface and flow is toward the Allegheny River.

The upper aquitard, referred to as the Till Unit, is located above the lower aquifer. This unit is a low-permeability lodgement till composed of greater than 50 percent silt and clay. This unit is heterogeneous and can contain some sandier layers that generally have limited lateral extents. The thickness of the upper aquitard at the Olean Well Field Site ranges from as little as six feet in the south to over 30 feet in the north, near the AVX Property. In the northern portion of the Site this unit is present at the surface and consists of surficial till. For the purposes of evaluating remedial alternatives, the Till Unit at the AVX Property is being addressed in two areas; the Historical Source Area and the Downgradient Till Unit (described further below).

The lower aquifer, also referred to as the City Aquifer, consists of glacial outwash deposits of sand, silt, and gravel. The thickness of the lower aquifer is approximately 70 feet in the northern portion of the Site and thins to approximately 30 feet south of the Allegheny River to the south. The lower aquifer is the main source of drinking water for the City and Town of Olean. In addition, several industrial facilities in the area utilize wells completed in the lower aquifer for manufacturing activities. The regional groundwater flow within the City Aquifer is generally in a west-southwest direction.

Recharge to the lower aquifer is via leakage from the upper aquifer through the upper aquitard or directly through the till (upper aquitard) where the upper aquifer is not present. The magnitude of leakage over the Olean Well Field Site is variable and is dependent on the thickness and permeability of the till (upper aquitard) and relative groundwater level differences between the upper aquifer (or till) and lower aquifer.

The lower aquitard has been described as silt, clay, and fine to very fine sand deposited in a pre-glacial environment. Groundwater level data and potentiometric surface maps indicate that lines of equal elevation for the upper aquifer generally parallel the Allegheny River. This indicates that groundwater flow is towards the river from both sides of the river valley. Natural flow conditions in the lower or City Aquifer within the vicinity of the Site have been altered by the pumping of the municipal wells, in operation since 1985, and an AVX production well, in operation since 1959.

Site History

Three municipal water supply wells (18M, 37M and 38M) at the Site (see **Figure 1**) were constructed and completed in the late 1970s to provide water for the City and the Town of Olean, New York. The supply wells draw water from the City Aquifer. Prior to the construction of these municipal wells, city water was supplied by a surface-water treatment facility which drew water from the Olean Creek. In 1981, these supply wells were found to contain trichloroethene (TCE) and other VOCs at concentrations exceeding federal maximum contaminant levels (MCLs) and drinking water standards set by the New York State Department of Health (NYSDOH). As a result, these wells were closed and the surface water treatment facility operations were reactivated to provide water to residents.

EPA subsequently evaluated the Site for inclusion on the National Priorities List (NPL) of known or threatened releases of hazardous substances. As a result of this evaluation, the Site was included on the National Interim Priorities List, by publication in the Federal Register on October 23, 1981, and was included on the first NPL on September 9, 1983.

Between 1981 and 1985, several separate federal-, state- and PRP-led investigations were conducted to identify the sources of contamination to the municipal wells and evaluate the nature and extent of groundwater contamination at the Site.

Following the discovery by the Cattaraugus County Department of Health and the NYSDOH that a number of private wells in the City and Town of Olean, all of which received groundwater from the upper aquifer overlying the Till Unit, were also contaminated with TCE, EPA performed an initial removal action[2] in January 1982. This action involved the installation of carbon adsorption filters on 16 contaminated private wells in the City and Town of Olean and periodic monitoring of those wells. In June 1984, EPA conducted a second removal action which included the replacement of one of the carbon filters installed as part of the initial removal action, installation of carbon units on ten additional contaminated private wells, and monitoring. In March 1985, EPA conducted a third removal action which consisted of the installation of carbon filter systems on two additional homes.

The results of the various investigations were documented in the ROD for OU1 issued by EPA on September 24, 1985. The ROD for OU1 called for the following: 1) installation of an air stripper to treat the contaminated groundwater from municipal water supply wells 18M, 37M and 38M; 2)

[2] Removal actions are often used to take early action in response to releases or threats of releases of hazardous substances.

extension of the City of Olean's public water supply line into the Town of Olean to connect approximately 93 residences served by private wells; 3) inspection of an industrial sewer; 4) recommendations for institutional controls to restrict the withdrawal of contaminated groundwater; 5) institution of a Site Monitoring Plan; and 6) performance of a supplemental RI/FS to evaluate source control measures at all facilities that were contributing to the groundwater contamination.

On February 7, 1986, EPA issued an administrative order unilaterally under Section 106(a) of CERCLA, 42 U.S.C. §9606, (OU1 UAO) to AVX, McGraw-Edison Company, Cooper Industries, Inc. (parent corporation of McGraw-Edison Company), Alcas, Aluminum Company of America (which at the time owned a percentage share of Alcas), and W.R. Case and Sons Cutlery Company (Case) (which at the time owned the remaining percentage share of Alcas), requiring them to implement the remedy selected in the OU1 ROD.

All of the PRPs, with the exception of Case, performed the actions pursuant to the OU1 UAO. Case subsequently filed for bankruptcy. The trustee in that bankruptcy entered into a consent decree with the United States which required the bankruptcy estate to pay a portion of EPA's past costs and a penalty for Case's failure to comply with the OU1 UAO.

Pursuant to the OU1 UAO, the extension of the City of Olean's water line was completed in 1988. In 1989, the private well users were connected to the water line extension. Although residents impacted by the Site were offered connection to the public water supply pursuant to the OU1 ROD, to date, some residents continue to use private wells as a source of potable water. Also in 1989, the industrial sewer at the McGraw property was inspected and repaired. In February 1990, construction of the air strippers was completed and the municipal well water supply service was reactivated. The current total pumping rate for the municipal wells is approximately 3 million gallons per day. Since the air strippers began operating, sampling indicates that the system effectively removes site contaminants from the groundwater pumped from the City Aquifer to meet State and Federal drinking water standards prior to distribution to the public.

On November 13, 1989, EPA issued an additional administrative order to Alcas. The order required Alcas to excavate approximately 10 cubic yards of contaminated soil from an area at the Alcas property where TCE had previously been used as a weed killer. This work was completed in 1989.

On June 25, 1991, an administrative order on consent was entered into between EPA and AVX, McGraw-Edison, Cooper Industries, Alcas and Alcoa Inc., (formerly Aluminum Company of America) for performance of a supplemental RI/FS. The supplemental RI/FS was a mixed work project. Pursuant to this administrative order, the PRPs were required to investigate their respective properties. In addition, EPA conducted studies on 10 additional properties. The results from the investigations conducted by EPA were provided to the PRPs for incorporation into the supplemental RI/FS. In addition to the AVX, Alcas and McGraw-Edison properties, the supplemental RI/FS identified the Loohns property as an additional source area.

Based on the results of the supplemental RI/FS, EPA issued a ROD for OU2 on September 30, 1996. The major components of the selected remedy for the AVX Property included the following:

- Excavation and removal of contaminated soil;
- Off-Site low temperature desorption of soil contaminants, if necessary;
- Upgradient and downgradient groundwater monitoring;
- Implementation of groundwater treatment, if excavation and removal of the contaminated soil did not adequately improve the quality of the City Aquifer and if the property continued to affect the groundwater entering the municipal wells; and
- Implementation of groundwater use restrictions.

The major components of the selected remedy for OU2 for the Alcas property included the following:

- Vacuum Enhanced Recovery (VER) of VOCs from contaminated soil;
- Upgradient and downgradient groundwater monitoring; and
- Implementation of groundwater use restrictions.

The major components of the selected remedy for the Loohns property included the following:

- VER or Soil Vapor Extraction with Air Sparging (SVE/AS). If design studies indicated VER and SVE/AS were impracticable due to the influence of the Allegheny River, the source area would be excavated;
- Upgradient and downgradient groundwater monitoring;
- Implementation of groundwater treatment if VER and SVE/AS or excavation do not adequately improve the quality of the City Aquifer, and if the Loohns property continued to affect the groundwater entering the municipal wells; and

- Implementation of groundwater use restrictions.

The major components of the selected remedy for the McGraw property included the following:

- Groundwater treatment;
- Upgradient and downgradient groundwater monitoring; and
- Implementation of groundwater use restrictions.

Implementation of the OU2 ROD

On March 17, 1998, three consent decrees were entered by the United States District Court for the Western District of New York. The Consent Decrees required McGraw Edison and Cooper Industries, Alcas and Alcoa, and AVX to perform the remedies for their respective properties as specified in the OU2 ROD.

McGraw-Edison - Cooper Industries:
Construction of a groundwater pump and treatment system for the contaminated upper groundwater aquifer at the McGraw property was initiated in 1999. The groundwater treatment system has been in operation since July 2001.

Loohns Dry Cleaners and Launderers:
In the absence of a viable PRP, EPA funded the implementation of the components of the selected remedy at the Loohns property. A remedial design study was completed in 1998 by EPA and based on this study, EPA elected to implement the soil excavation option of the selected OU2 remedy in lieu of VER or SVE/AS. In 2000, EPA initiated the soil excavation activities and approximately 3,000 cubic yards of soil contaminated with tetrachloroethylene (PCE) and other VOCs were excavated and disposed of off-Site. After soil excavation activities commenced, additional data collected at the property revealed that the quantity of soil requiring excavation significantly exceeded the estimated design quantity. As a result, an additional 4,000 cubic yards of contaminated soil was excavated and, along with the debris from the demolished remains of an old building on the property, disposed of off-Site. EPA has conducted periodic monitoring of the groundwater at the Loohns property since 2004.

Alcas:
In 1999, the PRPs associated with the Alcas property initiated a series of property-specific pre-design investigations that involved further characterization studies necessary to design the VER component of the selected remedy. Based upon the initial results of these studies, the PRPs determined that geological conditions in the Till Unit are heterogeneous and also that the source of groundwater contamination was not from the shallow soil at the rear of the property as identified in the OU2 ROD, but rather the data suggested that the main source of contamination was beneath the main manufacturing building. Based on this new information, Alcas conducted further investigations in 2001 to support its belief that a residual dense non-aqueous phase liquid (DNAPL) source is located at the property under the main manufacturing building.

On September 30, 2014, EPA issued an OU2 ROD Amendment and OU3 ROD calling for *in-situ* chemical oxidation (ISCO) using persulfate and excavation of certain contaminated soils at the Alcas property and enhanced *in-situ* anaerobic bioremediation (EAB) at Parcel B, with institutional controls. EPA expects remedial design activities for the implementation of this remedy will begin in 2015.

AVX:
AVX initiated the excavation of contaminated soil at its property in July 2000. Approximately 5,055 tons of contaminated soil was excavated to a depth of approximately 10 feet below grade surface and transported off-Site for disposal before work was halted. AVX could not excavate all of the contaminated soils because the material extended beyond the area identified as contaminated in the OU2 ROD to beneath the southeast corner of the manufacturing building, which was fully occupied with AVX's manufacturing operations. Further excavation had the potential to impact the structural integrity of the occupied building. As a result, the excavation area was backfilled pending further study. Further evaluations, discussed below, revealed significant unknown contamination extending under the building and that additional excavation and removal of all contaminated soil would result in significant disruption to and/or shutdown of the on-going operations.

UNKNOWN CONDITIONS OR NEW INFORMATION RELATED TO AVX PROPERTY

Following the backfilling at the AVX Property, EPA directed AVX to conduct soil and groundwater sampling activities at the AVX Property and properties to the south as part of a multi-phase investigation to assess the conditions at these properties. Results from these studies indicate that significant previously unknown VOC contamination is present in both soil and groundwater 1) beneath the southeastern portion of the AVX manufacturing building; 2) in the undeveloped wooded area of the AVX Property to the south of the manufacturing building which includes the north-south trending drainage swale that begins to the south of the building; and 3) beyond the southern AVX Property boundary downgradient of the manufacturing building (i.e., south of the Conrail rail road tracks). The extent of this contamination in these three areas

was not known at the time the OU2 ROD was issued. EPA has designated the previously-unknown contamination area south of the AVX Property (number 3 above) as OU4 and is presently conducting the OU4 RI/FS.

Groundwater and Soil Investigation Summary

Results of multiple (post-OU2 ROD) investigations, which included direct-push sampling, installation and sampling of monitoring wells, and direct-sensing technologies (e.g., membrane interface probes), have demonstrated that groundwater in the Till Unit is contaminated with VOCs beneath the AVX manufacturing building and in the undeveloped area between the building and the southern property boundary. Investigation results also show that the City Aquifer has been affected, but at much lower concentrations than in the shallow (till) stratigraphic unit.

VOC contamination in soil and groundwater consists primarily of TCE, 1,1,1-trichlorethane (1,1,1-TCA), PCE, and the breakdown products *cis*-1,2-dichloroethene (*cis*-1,2-DCE), vinyl chloride, 1,1-dichloroethane (1,1-DCA), with elevated concentrations of other VOCs, including 1,2-dichloroethane (1,2-DCA), toluene, xylenes, chloroethane, and acetone.

As set forth in the January 29, 2013 FSI Report, high concentrations of VOCs have been observed in soils (up to 1,614 milligrams/kilogram (mg/kg) of total VOCs) and groundwater (up to 325,000 micrograms per liter (µg/L) of total VOCs) beneath the southeast corner of the manufacturing building by a maintenance shop and a former solvent underground storage tank (both along the eastern edge of the manufacturing building), and in areas immediately to the south and north of the manufacturing building. Minimal detections of VOC contamination were detected in soils south of the fenced area (i.e., chain link fenced area in **Figure 2**)) of the AVX Property. High concentrations of VOCs have also been observed in groundwater (up to 379,987 µg/L of total VOCs) in the drainage swale area. Sampling data indicates that a significant amount of VOC contamination in groundwater has migrated downgradient from the Historical Source Area within the swale to the southern undeveloped area of the AVX Property.

A groundwater plume of VOC contamination in the Till Unit originates from the Historical Source Area and extends through the undeveloped area to at least the southern property boundary. Total VOC concentrations in the most highly contaminated parts of the plume commonly range between 10,000 to 50,000 µg/L. Overall groundwater flow in the silt-dominated Till Unit is slow; however, flow is faster in sand beds within the Till Unit. Although the sandier layers have limited lateral extents, they serve as preferred pathways for horizontal contaminated groundwater migration.

Groundwater sampled from monitoring well AVX-17S, installed after the OU2 ROD was issued, which is located about 100 feet north of the southern boundary of the AVX Property, contained relatively elevated concentrations of VOCs (33,000 µg/L in 2005), which led to several additional phases of investigation to delineate the extent of VOCs in the area south of the AVX Property. Groundwater in well AVX-19S, also installed after the OU2 ROD was issued and located at the southern boundary of the AVX Property, contains significantly elevated levels of TCE and 1,1,1-TCA as well as daughter/breakdown products, *cis*-1,2-DCE and 1,1-DCA.

Some natural attenuation of chlorinated organics through biodegradation is occurring in groundwater within the Till Unit, as demonstrated by observed geochemical conditions, generally decreasing concentrations of parent VOCs (TCE, PCE, 1,1,1-TCA), and increasing concentrations of their daughter products (*cis*-1,2-DCE, vinyl chloride, 1,1-DCA). However, based on the data collected to date, the biodegradation process is not considered complete nor consistent throughout the area.

Although the Till Unit has very low vertical permeability, some VOC contamination has moved vertically downward into the City Aquifer, most notably in wells AVX-4D (939 µg/L total VOCs in 2005) and AVX-19D (346 µg/L total VOCs in 2012). Concentrations of chlorinated VOCs in the City Aquifer beneath the manufacturing building are commonly several orders of magnitude lower than what is detected in groundwater within the overlying Till Unit. AVX has operated a production well (PW-1) for the extraction of groundwater at the AVX Property used as noncontact cooling water in its manufacturing processes for the past 55 years.

RISK SUMMARY

A baseline risk assessment was conducted as part of the OU2 ROD to estimate the risks associated with current and future site conditions. The baseline risk assessment estimated the human health and ecological risk which could result from the contamination at the Site if no remedial actions were taken.

Human Health Risk Assessment

Based on the data collected to date, the results of the baseline risk assessment contained in the OU2 ROD have not substantially changed. The baseline risk assessment evaluated the health effects which would result from exposure to groundwater contamination through three pathways, namely, ingestion, dermal contact and inhalation

WHAT IS RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment: A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or Record of Decision.

of volatilized contaminants during showering. Risks due to contaminants in the surface and subsurface soil were calculated for exposure as a result of dermal contact with, ingestion of, or inhalation of contaminants by construction workers. A residential exposure scenario for soil was not calculated because all of the properties studied during the OU2 RI/FS are zoned for industrial or commercial use. Most of these properties, including the AVX Property continue to be used as commercial/industrial facilities and there is no expectation that this use will change in the future.

The investigations discussed above revealed that the maximum concentrations of VOCs were detected beneath the building at a depth of five and 17 feet below the concrete slab floor of the building. (see **Table 1**, below)

Table 1: Maximum Detected Concentrations of VOCs at the AVX Property

Chemicals of Concern (COCs)	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)	Groundwater (µg/L)
cis-1,2 DCE	.640	65	170,000
trans-1,2-DCE	ND	ND	550
1,2-DCA	NA	ND	131
1,1,1-TCA	.044	990	348,000
TCE	0.49	650	320,000
Toluene	ND	460	39,000
PCE	.082	270	55,000
Vinyl Chloride	.060	ND	17,000
Xylene	ND	315	5,000

ND – Non-Detect
NA – Not Analyzed

The baseline risk assessment in the OU2 ROD identified carcinogenic risk and/or noncarcinogenic hazards that were above the acceptable carcinogenic risk range of 10^{-6} to 10^{-4} and the noncarcinogenic hazard index (HI) of 1 (see highlight **WHAT IS RISK AND HOW IS IT CALCULATED?**). As discussed in more detail below, EPA has determined that the results of the OU2 ROD risk assessment for the AVX Property have not substantially changed.

Soil

As part of the remedy modification process, EPA has conducted a qualitative analysis of the data to evaluate the risks associated with the elevated VOC concentrations detected in soil at the AVX Property subsequent to the issuance of the OU2 ROD. The estimated total risks and hazards are primarily due to elevated concentrations of *cis*-1,2-DCE, 1,1,1-TCA, TCE, toluene, PCE and xylene in the subsurface soil five feet below the concrete slab floor of the building. Refer to **Table 1** for the maximum concentrations of contaminants detected in the surface and subsurface soil

at the AVX Property. Based on this analysis, EPA has determined that the results of the OU2 ROD risk assessment have not substantially changed.

Groundwater

Discovery of the higher soil concentrations below the main building could also serve as a source material for continued groundwater contamination. The results of the baseline risk assessment performed for OU2 indicated that ingestion of and dermal contact with untreated groundwater at the Site poses unacceptable risks to human health. The baseline risk assessment evaluated all Site-related contaminants, however the estimated total risks were primarily due to TCE. Cancer risks due to ingestion of groundwater were determined to be approximately one-in-one-hundred for adults and young children (1.5×10^{-2} and 1.3×10^{-2}, respectively) and six-in-one-thousand (5.9×10^{-3}) for older children. The noncarcinogenic HI for these exposure groups were 3.4 for adults, 14.7 for young children and 6.7 for older children. Cancer risks due to dermal contact with groundwater contaminants were determined to be 2.4×10^{-3} for adults, 9.2×10^{-4} for young children and 6.7×10^{-4} for older children. The noncarcinogenic HIs for these exposure groups were less than one.

Cancer and noncancer risks due to inhalation of contaminants from untreated groundwater during showering were within EPA's acceptable risk range. Cancer risks for adults were determined to be 6.4×10^{-5} for adults and 6.0×10^{-5} young children, and 2.7×10^{-5} for older children. The noncarcinogenic HIs for these exposure groups were less than one. The cumulative upper-bound cancer risks for exposure through ingestion, dermal contact, and inhalation to untreated groundwater at the Site were 1.73×10^{-2} for adults, 1.39×10^{-2} for young children and 6.64×10^{-3} for older children, which are greater than the acceptable risk range of 10^{-4} to 10^{-6}. The estimated total risks were primarily due to TCE, which contributed significantly to the carcinogenic risk calculations and was attributable to releases of the contaminant into the ground and eventually into the groundwater.

As part of the remedy modification process, EPA has conducted a qualitative analysis of the data to estimate the risks associated with the elevated VOC concentrations detected in groundwater at the AVX Property subsequent to the issuance of the OU2 ROD. Although the baseline risk assessment performed for OU2 ROD evaluated exposure to untreated groundwater for the four sources areas collectively, each VOC detected at the AVX Property exceeded federal MCLs and State standards (refer to **Table 2**). Furthermore, this qualitative analysis revealed that the estimated total risks at the AVX Property were due to additional contaminants other than TCE and 1,1,1-TCA, including *cis*-1,2-DCE and tetrachloroethene (PCE). The maximum concentration of TCE, 1,1,1-TCA, *cis*-1,2-DCE and PCE detected in groundwater during the OU2 RI at the Site was 110,000 µg/L, 360,000 µg/L, 3,200 µg/L and 14,000 µg/L, respectively. Although the OU2 RI revealed maximum detected concentrations of TCE, 1,1,1-TCA, cis-1,2-DCE and PCE at the AVX Property of 110,000 µg/L, 360,000 µg/L, 73,000 µg/L and 14,000 µg/L, respectively, additional data collected subsequent to the OU2 ROD revealed maximum concentrations of 320,000 µg/L, 348,000 µg/L, 170,000 µg/L, and 55,000 µg/L for the respective contaminants at the AVX Property. Although most of the values are higher than the values reported in the OU2 ROD, the results of the baseline risk assessment contained in the OU2 ROD for groundwater have not substantially changed based on these concentrations.

Ecological Risk Assessment

The AVX Property is approximately 18.5 acres in size and includes lawns, plantings, a building with asphalt entry ways and parking areas, as well as wetlands and a wooded area to the south of the building. The area within the fence, which includes the lawn, plantings and parking area, does not provide significant habitat that could potentially support indigenous wildlife receptor species. Therefore, there are no ecological risks within the fenced area. For the area outside of the fence, which includes the wooded area and wetland area, a qualitative ecological risk assessment was conducted as part of the OU2 ROD to determine if contamination present at the AVX Property was impacting the wooded or wetland area. Given that the potential source of contamination in the wooded and wetland area would be contaminated groundwater discharging to the sediments, three sediment samples were collected from the wetlands. Analysis of the samples did not reveal any VOC contamination. Several semi-volatile organic compounds (SVOCs) were detected, but were not attributed to the AVX Property. EPA determined that the SVOCs were not impacting the groundwater. Based on this evaluation, it was determined that there is not a completed exposure pathway from the AVX property to the wooded or wetland areas.

Vapor Intrusion

VOC vapors released from contaminated groundwater and/or soil have the potential to move through the soil and seep through cracks in basements, foundations, sewer lines and other openings. EPA investigates the soil vapor intrusion pathway at homes and buildings situated at Superfund sites when the potential for vapor intrusion exists. While not directly related to the actions investigated as part of this Proposed Plan, EPA is taking this opportunity to update the public on the status of vapor intrusion investigations performed at the Site.

In April 2009, EPA initially conducted vapor intrusion sampling at 36 residences and commercial buildings near each of the four source areas identified in the OU2 ROD at the Site. Although EPA initially targeted additional properties near each of the source areas for vapor intrusion sampling based on their proximity to the underlying groundwater contamination, permission to perform the sampling was not received from all of the property owners. Where permission was granted, EPA drilled through the subslabs in the basements and installed ports in order to sample the soil vapor under the buildings. Sampling devices called Summa canisters were attached to these ports to collect air at a slow flow rate over a 24-hour period. Summa canisters were also placed in indoor areas in each structure in order to evaluate if soil vapor is entering each building, and outside several residences to determine if there were any outdoor sources that may impact indoor air. The Summa canisters were then collected and sent to a laboratory for analysis.

The analytical results of the April 2009 vapor intrusion sampling indicated that nine homes and one commercial building had concentrations of VOCs at or above EPA Region 2 screening levels in subslab vapor gases. However, all locations tested showed no concentrations of vapor intrusion gases in the indoor air of these locations above EPA health-based levels.

In 2010 and 2011, EPA retested properties that allowed access (seven homes and one commercial establishment) for the presence of vapor intrusion gases in both the subslab and indoor air. The data gathered revealed a declining trend in concentrations of vapor gases in the subslab of retested homes. One building located near the McGraw property showed TCE concentrations in the subslab vapor gas at 350 micrograms per cubic meter ($\mu g/m^3$) in 2009, 250 $\mu g/m^3$ in 2010, and nondetect in 2011. This building was retested in 2012 and 2014 and showed concentrations of TCE in the subslab gas at 512 $\mu g/m^3$ and 443 $\mu g/m^3$, respectively. However, no vapor intrusion constituents above health-based levels were detected in the indoor air. Based on the presence of elevated concentrations of TCE in the subslab gas, EPA intends to continue performing vapor intrusion monitoring at this building and other properties in the vicinity.

In April 2011, EPA performed an additional study in an area southwest of the Alcas Facility, and soil and groundwater samples were collected along Billington and Taggerty Avenues to, among other things, determine whether this area could be potentially impacted by vapor intrusion. The results did not reveal Site-related contamination in the soil samples; TCE was present in the groundwater at low levels (maximum concentration of 3.52 µg/L).

EPA collected additional vapor intrusion data in April 2015 and is awaiting the results. Based on EPA's investigation thus far, the vapor-intrusion pathway was determined not to constitute a significant risk to human health.

Although some properties in the vicinity of the AVX Property have been sampled as part of the efforts described above, indoor air sampling has not been conducted at the AVX Property.

Summary of Human Health and Ecological Risks

The results of the investigations and the human health risk assessments indicate that the OU2 contaminated groundwater presents an unacceptable exposure risk. Discovery of the higher contaminant concentrations in soil below and adjacent to the building at the AVX Property, while not impacting the potential soil risk and hazards due to the depth of this contamination, serve as source material for continued groundwater contamination and, therefore, it is necessary to address the soil contamination as well as groundwater contamination.

The ecological evaluation indicates that the AVX Property should not pose any unacceptable risks to aquatic or terrestrial ecological receptors.

It is EPA's current judgment that the Preferred Alternatives summarized in this Proposed Plan are necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered guidance, and site-specific risk-based levels.

The RAOs for the AVX Property in the OU2 ROD were developed for two contaminated media – groundwater and soil. The RAOs were designed to restore the upper and lower aquifers to their beneficial use as a source of drinking water. Groundwater objectives included the removal and/or control of the sources of contamination to the groundwater and the removal of sources of contamination already in the groundwater. Soil objectives included the elimination of leaching of contaminants of concern from the soil at each of the source areas into the groundwater.

The groundwater RAOs for the AVX Property for this interim remedy modification remain consistent with the OU2 ROD. They are:

- Restore the City Aquifer beneath the AVX Property to its beneficial use as a source of drinking water by reducing contaminant levels to the more stringent of federal MCLs or New York State standards;
- Minimize, contain and/or eliminate sources of VOC contaminants already in the shallow groundwater at the AVX Property; and
- Minimize and/or eliminate the potential for future human exposure to Site contaminants via contact with contaminated groundwater and/or inhalation of vapors.

The groundwater remediation goals established for this proposed interim remedy modification are identified in **Table 2**, below.

Table 2: Remediation Goals for Groundwater

Chemicals of Concern (COCs)	NYS Groundwater Quality Standards (µg/L)	NYS Drinking Water Quality Standards (µg/L)	National Primary Drinking Water Standards (µg/L)
cis-1,2 DCE	5	5	70
trans-1,2-DCE	5	5	100
1,2-DCA	5	5	5
1,1,1-TCA	5	5	5
TCE	5	5	5
Toluene	1,000	1,000	1,000
PCE	5	5	5
Vinyl Chloride	2	2	2
Xylene	5	5	10,000

The soil RAOs for the AVX Property for this interim remedy modification are:

- Minimize, contain and/or eliminate VOC contaminants from soils at the AVX Property that are leaching into the groundwater; and
- Minimize and/or eliminate the potential for human exposure to Site contaminants via contact with contaminated soil and/or inhalation of vapors.

Soil remediation goals for addressing the AVX Property soil contamination are identified in **Table 3**, below.

Table 3: Remediation Goals for Soil

Chemicals of Concern (COCs)	Soil Remediation Goals* (mg/kg)
cis-1,2 DCE	0.25
trans-1,2-DCE	0.19
1,2-DCA	0.02
1,1,1-TCA	0.68
TCE	0.47
Toluene	0.7
PCE	1.3
Vinyl Chloride	0.02
Xylene	1.6

* New York State's 6 NYCRR Part 375-6.3(b))

SUMMARY OF REMEDIAL ALTERNATIVES

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

The OU2 ROD evaluated six remedial alternatives to address the contamination at the AVX Property: 1) No Action, 2) Institutional Controls, 3) Capping, 4) Groundwater Pump-and-Treat, 5) Vacuum Enhanced Recovery, and 6) Excavation, Treatment and Disposal.

Additional characterization of the contamination at the AVX Property, after the OU2 ROD was issued, resulted in the evaluation of remedial technologies as part of the February 4, 2015 FS Report to address the AVX Property.

The 2015 FS Report evaluated various technologies to remediate the contaminated soil and groundwater at the AVX Property. To address this contamination, remedial alternatives were developed for three different remediation areas; Historical Source Area, Downgradient Till Unit, and the City Aquifer.

This Proposed Plan summarizes the following four remedial alternatives for contaminated soil and groundwater in the Historical Source Area:

- No Action (Alternative S-1)
- Exposure Barrier (Alternative S-2)
- *In-Situ* Thermal Remediation (Alternative S-3)
- Multi-Phase Extraction (Alternative S-4)

The following three remedial alternatives are summarized for the contaminated groundwater in Downgradient Till Unit (located downgradient of the Historical Source Area):

- No Action (Alternative DTGW-1)
- Hydraulic Trench Containment (Alternative DTGW-3)
- Permeable Reactive Barrier (Alternative DTGW-4)

The FS Report included Monitored Natural Attenuation (MNA) for the Downgradient Till Unit, identified as DTGW-2. For the purposes of this Proposed Plan, this alternative is not carried forward as a stand-alone alternative for the Downgradient Till Unit, because it would not meet the RAOs for this interim action.

The following two remedial alternatives are summarized for the contaminated groundwater in the City Aquifer at the AVX Property.

- No Action (Alternative CAGW-1)
- Hydraulic Pumping Containment (Alternative CAGW-2)

Detailed descriptions of the interim remedial alternatives for addressing the contamination associated with the AVX Property can be found in the February 4, 2015 FS Report, which is part of the administrative record for this Proposed Amendment to the OU2 ROD, and can be found in the information repositories identified above.

The construction time for each remedial alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any PRPs, or procure contracts for design and construction.

Common Elements

With the exception of the no action alternatives, all of the alternatives for the Historical Source Area, the Downgradient Till Unit, and the City Aquifer, include common components as follows:.

Long-Term Monitoring:
A long-term monitoring program would be implemented to verify the effectiveness of the selected interim remedy. The long-term groundwater monitoring program would consist of a comprehensive monitoring well network comprised of existing monitoring wells and potentially additional monitoring wells and piezometers on and off the AVX Property, within the Till Unit and City Aquifers to verify the effectiveness of the interim remedy. It would also include additional geotechnical monitoring to further evaluate attenuation processes in groundwater.

Institutional Controls:
A plan would be developed which would specify institutional controls to restrict exposure to hazardous substances until RAOs are met. Such controls could include proprietary controls, such as deed restrictions for groundwater and soil use, existing governmental controls, such as well permit requirements, and informational devices, such as publishing advisories in local newspapers and issuing advisory letters to local governmental agencies regarding groundwater use in the impacted area.

Site Management Plan:
A site management plan (SMP) would be developed to provide for the proper management of the interim remedy at the AVX Property post-construction, and would also include institutional controls, long-term groundwater monitoring, potential for soil vapor intrusion, periodic reviews and certifications. Until a final remedy is selected, the SMP would also provide for the proper management of any contaminated unsaturated soils at the AVX Property and the evaluation of the potential for vapor intrusion at the existing building on AVX Property and/or for any buildings constructed in the future, and mitigation, if necessary, in compliance with the SMP. The SMP would also provide for the proper implementation, management and maintenance of institutional controls. A change in the current use of the building in the future would trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy.

In addition, because any combination of remedial alternatives evaluated will result in contaminants remaining on the AVX Property above levels that would allow for unrestricted use and unlimited exposure, a review of conditions at the Site will be conducted no less often than once every five years. If justified by the review, additional response actions might be implemented.

Historical Source Area

Alternative S-1: No Action

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be used as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the AVX Property to address soil and groundwater contamination in the Historical Source Area.

Alternative S-2: Exposure Barrier

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Costs:	$47,000
Present-Worth Cost:	$627,000
Construction Time:	3 months

Under this alternative, existing surface covers (the building, paved areas in the northern part of the Historical Source Area, and the vegetative cover in the drainage swale area) would be maintained to minimize potential leaching of VOC contamination from soil to groundwater and would also serve as a direct contact exposure barrier. Activities involved in maintaining the surface cover may potentially include items such as inspecting the asphalt cap and vegetative cover, filling cracks within the asphalt cap as needed, partial replacement of the asphalt cap as needed, clearing invasive vegetation, and seeding the vegetative cover as needed. The building and pavement in the northern part of the Historical Source Area will limit potential receptor exposure in these locations and minimize further migration of contaminants from soil to groundwater.

Alternative S-3: *In-situ* Thermal Remediation

Capital Cost:	$1,320,000
Operation & Maintenance (O&M) Costs[3]*:*	$1,125,000
Present-Worth Cost:	$3,306,000
Construction Time:	12 months

This alternative would employ *in-situ* thermal remediation in accessible areas to remediate VOC contamination in soil and groundwater in the Till Unit.

To implement *in-situ* thermal remediation using electrical resistance heating, a series of electrodes, vapor extraction wells, and sensor wells would be installed within soil and Till Unit treatment areas. An electrical current would be passed from electrode to electrode through the water contained in the soil/groundwater matrix, causing the temperatures of the soil and groundwater to increase. The increased temperature would cause the vapor pressure of the target VOCs to rise and increase the volatilization and recovery of these constituents through soil vapor extraction. The VOCs would be collected above grade and treated, as necessary, to remove contaminants. Steam vapors would also be produced, which would increase the subsurface permeability and the efficiency of the vapor extraction wells. For the purposes of developing a conceptual design and cost estimate for comparison with other technologies, the FS estimated a target temperature for the treatment area of slightly less than 100 degrees Celsius with a treatment depth of 25 feet below ground surface (bgs). The volume of accessible soil to be remediated by the *in-situ* thermal remediation system is estimated to be 33,000 cubic yards. O&M activities associated with this operation may include groundwater and vapor sampling; maintaining the vapor extraction wells; and balancing the applied vacuum, water recharge, and electrical currents to optimize the system performance.

Alternative S-4: *In-situ* Multi-Phase Extraction

Capital Cost:	$736,000
Annual Operation & Maintenance (O&M) Costs:	$120,000
Present-Worth Cost:	$1,988,000
Construction Time:	10 months

This alternative would employ *in-situ* multi-phase extraction (MPE) of contaminated soil and groundwater to remediate the VOCs in soil and groundwater in the Till Unit in accessible areas.

MPE involves the installation of an extraction well network and application of a vacuum to each well to simultaneously extract VOCs from the soil (in both saturated and unsaturated zone) and the groundwater zone. For the purposes of developing a conceptual design and cost estimate for comparison with other technologies, the FS estimated that the MPE system would consist of the construction of a network of 25-foot-deep extraction wells with a target radius of influence of 15 feet for each well. The volume of accessible soil to be remediated by the MPE system is estimated to be approximately 33,000 cubic yards. A groundwater extraction rate of 0.5 gallons per minute (gpm) per well is estimated, with a total groundwater extraction rate of 7 gpm. A vapor extraction

[3] O&M costs presented for Alternative S-3 are total costs, instead of annual costs.

rate of 30 cubic feet per minute is estimated with a total vapor extraction rate of 390 cubic feet per minute.

Downgradient Till Unit

Alternative DTGW-1: No Action

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be used as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the AVX Property to address groundwater contamination in the downgradient Till Unit.

Alternative DTGW-3: Hydraulic Trench Containment

Capital Cost:	$355,000
Annual Operation & Maintenance (O&M) Costs:	$125,000
Present-Worth Cost:	$1,943,000
Construction Time:	5 months

This alternative would employ a hydraulic containment and treatment system to prevent further migration of groundwater contamination.

Due to the limited permeability of the saturated zone underlying the AVX Property, this alternative would employ a groundwater extraction trench instead of a vertical extraction well network to extract groundwater for treatment and disposal. For the purposes of developing a conceptual design and cost estimate for comparison with other alternatives, the FS Report estimated that a hydraulic trench would be installed at the AVX Property boundary and operate at an optimal extraction rate estimated to be about 10 gpm for 30 years. The construction of a gravel trench that is 200 feet long, 20 to 25 feet deep, and 2 feet wide would create a more permeable zone where groundwater would be extracted and allow for hydraulic capture from a large area with a low groundwater extraction rate. Extracted groundwater would be treated (e.g., air stripping and granular activated carbon) prior to discharge to the surface water drainage ditch at the southern edge of the AVX Property. During the remedial design, an evaluation would be conducted to determine the impacts, if any, of these construction activities on the wetlands area and a wetlands mitigation plan would be developed, as determined necessary. In addition, during the remedial design, performance tests would be conducted to determine that the remedial objectives are achieved. O&M activities associated with the extraction trench and groundwater treatment system may include system inspections, adjustments, and repairs, replacing the granular-activated carbon as it is spent, maintenance of the air stripper, and treatment system effluent sampling.

Alternative DTGW-4: Permeable Reactive Barrier

Capital Cost:	$671,000
Annual Operation & Maintenance (O&M) Costs:	$48,000
Present-Worth Cost:	$1,062,000
Construction Time:	4 months

Under this alternative, a Permeable Reactive Barrier (PRB) containing a reactive material such as zero valent iron (ZVI) would be installed at the property boundary to remediate some of the VOCs[4] present in the groundwater of the Till Unit, preventing the migration of them in the Till Unit past the property boundary.

A PRB consists of a permeable wall built below the ground surface to intercept and treat contaminated groundwater. The PRB would be built by excavating a narrow trench perpendicular to the path of transport of contamination in groundwater and filling the trench with a reactive material, such as ZVI, that can destroy or mitigate the transport of VOC-contaminated groundwater while allowing the passage of water. For the purposes of developing a conceptual design and cost estimate for comparison with other alternatives, the FS Report estimated that the PRB would consist of constructing one 200-foot-long, 25-foot-deep, and 1-foot-wide barrier at the property boundary. The PRB would be constructed from a mix of 60% ZVI and 40% sand, and would require replacement approximately every 20 years based on the estimated lifespan of the reactive materials. During the remedial design, an evaluation would be conducted to determine the impacts, if any, of these construction activities on the wetlands area and a wetlands mitigation plan would be developed, as determined necessary.

City Aquifer

Alternative CAGW-1: No Action

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

[4] 1,2-DCA, toluene, xylenes, and acetone are known to be present at the AVX Property but not amenable to treatment with ZVI.

The NCP requires that a "No Action" alternative be used as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the AVX Property to address groundwater contamination in the City Aquifer.

Alternative CAGW-2: Hydraulic Pumping Containment

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Costs:	$113,000
Present-Worth Cost:	$1,403,000
Construction Time:	0 months

Under this alternative, the existing production well at the AVX Property would act as an active groundwater recovery and containment system to prevent further migration of contaminated groundwater. This system consists of one existing production well operating at an optimal extraction rate of 300 to 400 gpm to provide hydraulic control.

O&M activities associated with the groundwater pumping system would include system inspections, adjustments, repairs, extraction well cleaning and maintenance, and sampling of the effluent to meet the substantive requirements of SPDES or publicly owned treatment works discharge permit requirements. The production well currently meets existing discharge requirements. However, if surface-water discharge limits would not be met during implementation of this alternative, an air stripper or carbon adsorption system or combination thereof would be added to the extraction system. In addition, monitoring parameters would include, among other items, data collection to ensure that hydraulic containment is being achieved. If hydraulic containment is not being achieved, then additional extraction wells would be installed or the pumping rates changed to ensure hydraulic containment.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. Refer to the table on this page for a description of these evaluation criteria.

As the alternatives presented in this Proposed Plan are an interim remedy, in accordance with EPA guidance, these alternatives are expected to be protective of human health and the environment in the short term and are intended to provide adequate protection until a final ROD for the AVX Property is issued.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Historical Source Area:

Since no action would be implemented, Alternative S-1 (No Action) would not meet RAOs, would not control exposure

to contaminated soil and groundwater, and would not reduce risk to human health or the environment. Although Alternative S-2 (Exposure Barrier) would prevent exposure to contaminants in the soil and groundwater in the Till Unit, this alternative would not be effective in reducing concentrations of VOC contamination in soil or groundwater in the Historical Source Area. Alternatives S-3 (*In-Situ* Thermal Remediation) and S-4 (*In-Situ* Multi-Phase Extraction) are both active remedies that would remediate contamination in accessible areas in the Historical Source Area; however, these alternatives would not address contamination in non-accessible areas, including beneath the manufacturing building where most of the highest concentrations of contaminants are present, acting as a continuing source of contamination. As such, Alternatives S-2, S-3 and S-4 are expected to provide a similar level of protection of human health and the environment for the Historical Source Area. Alternatives S-2, S-3 and S-4 achieve interim protectiveness by limiting exposure to contaminants through the implementation of institutional controls. Since this is an interim remedy, Alternatives S-2, S-3 and S-4 would each be protective of human health and the environment for the Historical Source Area in the short term and are intended to provide adequate protection until a final ROD for the AVX Property is issued.

Because Alternative S-1 (No Action) would not be protective of human health and the environment, it was not carried forward for further evaluation.

Downgradient Till Unit:

Since no action would be implemented, Alternative DTGW-1 would not meet RAOs, would not control exposure to contaminated groundwater, would not reduce risk to human health or the environment, and would not contain or restore the groundwater. Alternatives DTGW-3 and DTGW-4 would treat contaminated groundwater from the downgradient Till Unit prior to groundwater migrating off-property. Alternative DTGW-3 provides a higher level of protection of human health and the environment than DTGW-4 by providing treatment to more of the VOCs in the groundwater of the Till Unit. Protectiveness under Alternatives DTGW-3 and DTGW-4 require a combination of actively reducing contaminant concentrations prior to groundwater migration off-property limiting exposure to contaminants through the implementation of institutional controls. Since this is an interim remedy, Alternatives DTGW-3 and DTGW-4 would each be protective of human health and the environment in the short term and are intended to provide adequate protection until a final ROD for the AVX Property is issued.

Because Alternative DTGW-1 (No Action) would not be protective of human health and the environment, it was not carried forward for further evaluation.

City Aquifer:

Since no action would be implemented, Alternative CAGW-1 would not meet RAOs, would not control exposure to contaminated groundwater, would not reduce risk to human health or the environment, and would not restore the groundwater. Alternative CAGW-2 is an active remedy that would prevent the migration of VOCs from the AVX Property in the City Aquifer. Protectiveness under Alternative CAGW-2 requires a combination of actively controlling the migration of contaminated groundwater in the City Aquifer and limiting exposure to contaminants through the implementation of institutional controls.

Because Alternative CAGW-1 (No Action) would not be protective of human health and the environment, it was not carried forward for further evaluation.

COMPLIANCE WITH ARARS

This interim action is only expected to comply with ARARs, "to-be-considered" criteria, or other guidance that are relevant to the limited scope of this interim action.

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR § 5-1.51 Chapter 1), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). The federal MCLs and State standards for the AVX Property are identified on **Table 2**, above. If the standards are not equivalent, compliance with the more stringent standard is required. The aquifers underlying the AVX Property are designated as a potable water supply.

EPA has identified New York State's 6 NYCRR Part 375-6.3(b) for unrestricted use as an ARAR, a "to-be-considered," or other guidance to address contaminated soil at the AVX Property for protection of groundwater. Refer to **Table 3** for the remediation goals for soils.

Historical Source Area:

Alternatives S-2, S-3, and S-4 would comply with location- and action-specific ARARs. None of the alternatives would achieve contaminant-specific ARARs, such as MCLs, at this time.

Downgradient Till Unit:

Alternatives DTGW-2, DTGW-3, and DTGW-4 would comply with location- and action-specific ARARs and

would provide adequate protection until a final ROD for the AVX Property is issued.

While the hydraulic containment under Alternative DTGW-3 would comply with the chemical-specific ARARs for treated groundwater, the PRB under Alternative DTGW-4 would not treat some of the VOCs and, therefore, not all chemical-specific ARARs may be met. Specifically, the compounds 1,2-DCA, toluene, xylenes, and acetone known to be present at the AVX Property are not treatable with ZVI.

City Aquifer:

Alternative CAGW-2 would comply with location- and action-specific ARARs, reduce the overall time to achieve chemical-specific ARARs and provide adequate protection until a final ROD for the AVX Property is issued.

LONG-TERM EFFECTIVENESS AND PERMANENCE

As indicated above, interim remedies are intended to be protective of human health and the environment in the short term, and to provide adequate protection until a final ROD is issued. The contamination mass remaining in soils at the AVX Property results in the continued releases of hazardous substances to the groundwater and, as such, limits the long-term effectiveness of any of the alternatives for the AVX Property to achieve the remediation goals for soil or groundwater. This interim remedy, therefore, is not intended to provide a permanent remedy for the AVX Property.

Historical Source Area:

Alternatives S-3 and S-4 would provide a higher degree of long-term effectiveness and permanence, since *in-situ* thermal treatment and MPE are proven technologies to address VOC contamination considering the silty soil and limited permeability conditions present in the accessible areas within the Historical Source Area. However, as discussed previously, the alternatives considered for this area cannot address VOC-contaminated soil beneath the AVX building, and would result in contaminant mass remaining in soils beneath and adjacent to the building at the AVX Property, resulting in continued releases of hazardous substances to the groundwater and thus, limiting long-term effectiveness.

Downgradient Till Unit:

Alternative DTGW-3 would prevent potential receptor exposure downgradient of the AVX Property as well as on-property by intercepting and treating all VOCs. Alternative DTGW-4 may not be completely effective due to the inability of the PRB to treat certain contaminants known to be present on-site. Although some of these non-treatable contaminants do not appear to be widespread in the groundwater on the AVX Property, it is possible that, with time, these contaminants could reach the southern boundary of the AVX Property. 1,2-DCA, one of the contaminants that cannot be treated with the PRB, is already known to be present at the down-gradient boundary of the AVX Property. Alternative DTGW-4 would have greater risk over the long term than Alternative DTGW-3 due to the presence of non-ZVI treatable contaminants on Site, particularly 1,2-DCA. Alternative DTGW-3 would avoid the uncertainties associated with PRB treatment of all contaminants and ensure that all present and potential future contaminants reaching the Site boundary would be effectively intercepted and removed.

City Aquifer:

Hydraulic control under Alternative CAGW-2 would be an effective long-term technology to prevent the migration of contamination in the City Aquifer, if operated properly. As discussed previously, the contamination mass remaining in soils at the AVX Property would result in the continued releases of hazardous substances to the groundwater and, as such, limits the long-term effectiveness of Alternative CAGW-2 to achieve MCLs in the City Aquifer at the AVX Property.

REDUCTION OF TOXICITY, MOBILITY OR VOLUME

Because this action does not constitute the final remedy for the AVX Property, the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element is not fully addressed here but will be satisfied by the final response action.

Historical Source Area:

Under Alternative S-2, the soil covers would minimize leaching of VOCs from soil to the groundwater in the Till Unit. However, Alternative S-2 would not reduce the toxicity or volume of VOCs present in the Historical Source Area. Alternatives S-3 and S-4 would both provide a reduction of contamination volume, toxicity and mobility in accessible areas of the Historical Source Area. Alternatives S-3 and S-4, however, would not reduce further the mobility of contamination, in particular, the remaining contamination in non-accessible areas, from the Till Unit Groundwater Aquifer to the City Aquifer. The highest concentrations of contaminants are present in non-accessible areas beneath the manufacturing building where Alternatives S-3 and S-4 would not provide any reduction of contamination volume, toxicity and mobility.

Downgradient Till Unit:

Alternative DTGW-3 would provide the greatest reduction in mobility, toxicity, and volume of VOCs by intercepting and treating the contaminated groundwater in the Till Unit prior to migrating off-property. Alternative DTGW-4 would reduce the mobility, toxicity, and volume of most but not all VOCs in groundwater in the Till Unit prior to groundwater migrating off-property. Exceptions would be 1,2-DCA, toluene, xylenes, and acetone. Although toluene, xylenes, and acetone may not reach the down-gradient boundary of the AVX Property in the near future, 1,2-DCA is already known to be present at and beyond the downgradient property boundary and would continue to migrate off-property under Alternative DTGW-4. 1,2-DCA, for example, has been detected at a concentration three times greater than its remediation goal along the southern boundary of the AVX property where the PRB would be installed.

City Aquifer:

Alternative CAGW-2 would provide hydraulic control of contaminated groundwater in the City Aquifer, thereby preventing further migration of contaminated groundwater beyond the AVX Property. In the event that an air stripper or carbon adsorption system or combination thereof would be added to the extraction system to meet surface water discharge requirements, this alternative would provide additional reduction of toxicity and volume of VOCs.

SHORT-TERM EFFECTIVENESS

Historical Source Area:

Alternative S-2 would require limited activities (i.e., surface cover maintenance and groundwater monitoring) that would result in short-term exposure risks to workers, the public, or the environment, although these activities would be managed through engineering controls and worker training. Alternative S-2 has an estimated implementation timeframe of 3 months. The installation of the electrodes and associated extraction wells for Alternative S-3 and MPE wells for Alternative S-4 may result in short-term exposure risks to workers, the public, or the environment, but these potential risks would be managed through engineering controls, vapor monitoring and mitigation, and worker training. The implementation timeframes for Alternatives S-3 and S-4 are estimated at 12 months and 10 months, respectively.

Downgradient Till Unit:

Alternative DTGW-3 could have potential impact on workers, communities, or the environment from the installation of a hydraulic containment trench, with treatment system, and O&M of the extraction system; however, those impacts would be managed through engineering controls and worker training. Implementation of Alternative DTGW-3 is estimated at 5 months. Alternative DTGW-4 would have similar potential short-term impacts to workers, the public, or the environment from the initial installation of the PRB and every 20 years when it would have to be completely removed and replaced if it is still in place when EPA selects a final remedy for the AVX Property. Alternative DTGW-4 has an estimated implementation timeframe of 4 months. Potential short-term impacts would be managed through engineering controls, air monitoring and mitigation, and worker training.

City Aquifer:

Under Alternative CAGW-2, the groundwater extraction well PW-1 is already installed and operating. Minimal exposure risks to workers, the public, or the environment would be posed by O&M of the extraction system and the expanded groundwater monitoring activities. These potential risks would be managed through engineering controls, air monitoring, and worker training. Alternative CAGW-2 requires no time to construct since it is anticipated that the existing production well will serve as the extraction well.

IMPLEMENTABILITY

Historical Source Area:

There are no implementability issues associated with Alternatives S-2, S-3 and S-4. Each of these alternatives involve well-established technologies with commercially available equipment and are implementable.

Alternative S-2 would be easier to implement than Alternatives S-3 and S-4 since it does not require the construction of a treatment system.

Downgradient Till Unit:

Alternatives DTGW-3 and DTGW-4 involve well-established technologies with commercially available equipment and are implementable. Under Alternative DTGW-3, long-term O&M of the equipment would be required. Sufficient hydraulic capture is expected to be achieved through a relatively low groundwater extraction

rate. Under Alternative DTGW-4, maintenance of the PRB would not be expected, although the reactive ZVI material within the barrier would require replacement after approximately every 20 years if it is still an integral component of the remedy at that time. Alternative DTGW-4 would also avoid the need for a surface water treatment system that requires maintenance and security that is required for Alternative DTGW-3. Alternatives DTGW-3 and DTGW-4 would require groundwater quality, performance, administrative, and institutional controls monitoring.

City Aquifer:

Alternative CAGW-2 involves a well-established technology with commercially available equipment and is already operating at the facility. Alternative CAGW-2 would require O&M for the life of the remedy including groundwater quality, performance, administrative, and institutional controls monitoring.

Cost

The estimated capital costs, operation, maintenance and monitoring (O&M) costs, and present-worth costs for the alternatives discussed in this Proposed Plan are presented below. Further detail may be found in the February 4, 2015, FS Report. The cost estimates are based on the best available information and are accurate within a range of +50 to -30 percent.

Alternative	Capital & Periodic Cost	Annual O&M Cost	Present Worth Cost
Historical Source Area			
S-1 - No Action	$0	$0	$0
S-2 - Exposure Barrier	$0	$47,000	$627,000
S-3 - *In-Situ* Thermal Remediation	$1,320,000	$1,125,000	$3,306,000
S-4 - *In-Situ* Multi-Phase Extraction	$736,000	$120,000	$1,988,000
Downgradient Till Unit			
DTGW-1 - No Action	$0	$0	$0
DTGW-3 - Hydraulic Trench Containment	$355,000	$125,000	$1,943,000
DTGW-4 - Permeable Reactive Barrier	$671,000	$48,000	$1,062,000
City Aquifer			
CAGW-1 - No Action	$0	$0	$0
CAGW-2 - Hydraulic Pumping Containment	$0	$113,000	$1,403,000

State/Support Agency Acceptance

NYSDEC concurs with the preferred alternatives for the AVX Property.

Community Acceptance

Community acceptance of the preferred alternatives will be evaluated after the public comment period ends and will be described in the OU2 ROD Amendment for the AVX Property.

THE PREFERRED REMEDY

Based on an evaluation of the remedial alternatives, EPA, in consultation with NYSDEC, proposes the following as an interim remedy for the AVX Property:

Historical Source Area:

- Alternative S-2: Exposure Barrier

Downgradient Till Unit:

- Alternative DTGW-3: Hydraulic Trench Containment

City Aquifer:

- Alternative CAGW-2: Hydraulic Pumping Containment

The preferred remedy has the following key components:

- Implementation of remedial design to provide details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program.
- Exposure Barrier for the Historical Source Area Soil and Till Unit Groundwater utilizing and maintaining existing surface covers (the building and paved areas in the northern Historical Source Area and the vegetative cover in the drainage swale area) to minimize leaching of VOCs from soil to groundwater and would also serve as a direct contact exposure barrier.
- Hydraulic Trench Containment for the Downgradient Till Unit involving construction of a gravel trench coupled with active groundwater recovery and treatment to prevent migration of groundwater downgradient of the AVX Property.
- Hydraulic Pumping Containment for the City Aquifer utilizing and maintaining the existing AVX Property production well (PW-1) as an active groundwater recovery system at a required pumping rate to prevent further migration of contaminated groundwater into the City Aquifer. An air stripper or carbon adsorption system or combination thereof would be added to the extraction system, as necessary to meet surface water discharge requirements.

- Institutional controls, including soil and groundwater use restrictions, to ensure the remedy remains protective. An SMP would be developed which would specify institutional controls to restrict exposure to hazardous substances which are anticipated to include proprietary controls, such as deed restrictions for development of the controlled property for commercial and industrial, groundwater and soil uses, existing governmental controls, such as well permit requirements, and informational devices, such as publishing advisories in local newspapers and issuing advisory letters to local governmental agencies regarding groundwater use in the impacted area.
- Implementation of a long-term groundwater monitoring program as part of the SMP to verify the effectiveness of the preferred interim remedy, and to track and monitor changes in the groundwater contamination over time at the AVX Property. The long-term groundwater monitoring program would consist of a comprehensive monitoring network made up of existing monitoring wells and additional monitoring wells and piezometers on and off the AVX Property, within not only the City Aquifer but also within the till unit, and also monitoring to further evaluate attenuation processes.
- Development of an SMP to provide for the proper management of the interim remedy at the AVX Property post-construction, and would also include long-term groundwater monitoring, periodic reviews and certifications. Until a final remedy is selected, the SMP would also provide for the proper management of any contaminated unsaturated soils at the AVX Property and the evaluation of the potential for vapor intrusion at the existing building on AVX Property and/or for any buildings constructed in the future, and mitigation, if necessary, in compliance with the SMP. The SMP would also provide for the proper implementation, management and maintenance of institutional controls. A change in the current use of the building in the future would trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy.

The environmental benefits of the preferred interim remedy may be enhanced by employing design technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.[5]

The total estimated present-worth cost for the preferred remedy is $3,973,000. Further detail of the cost is presented in Appendices B, C, and D of the February 4, 2015, FS Report.

As the preferred remedy constitutes an interim remedy addressing soil and groundwater contamination at the AVX Property until such time in the future when the goal of the 1996 OU2 ROD of complete source removal and restoration can be achieved (i.e., a change in the use of the building in the future triggering the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy), contaminants will remain above levels that would allow for unrestricted use and unlimited exposure. As a result, in accordance with CERCLA, the Site is to be reviewed at least once every five years.

Basis for the Remedy Preference

Additional investigations conducted subsequent to the OU2 ROD revealed conditions that were not known at the time of the issuance of the OU2 ROD. Multi-phase post-OU2 ROD investigations conducted revealed the presence of significant VOC contamination beneath the southeastern portion of the AVX manufacturing building in addition to contamination towards AVX's southern property boundary downgradient of the manufacturing building.

EPA believes that the preferred remedy consisting of Alternative S-2: Exposure Barrier, Alternative DTGW-3: Hydraulic Trench Containment, and Alternative CAGW-2: Hydraulic Pumping Containment for the AVX Property provides the best balance of trade-offs between alternatives with respect to the balancing criteria discussed above. Based on information currently available, EPA believes that the preferred interim remedy is protective of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected for the AVX Property; complies with those federal and state requirements that are applicable or relevant and appropriate for this limited-scope action, and is cost-effective. The preferred remedy therefore meets the threshold criteria, and provides the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. Because this action does not constitute the final remedy for the AVX Property, the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element, although partially addressed by this interim remedy, will be fully addressed by the final response action. Subsequent actions are planned to address fully the threats posed by conditions at the AVX Property.

[5]http://epa.gov/region2/superfund/green_remediation.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of the remedial action. Because this is an interim action, review of this remedy and the Site will be ongoing as EPA develops the final remedy for the AVX Property.

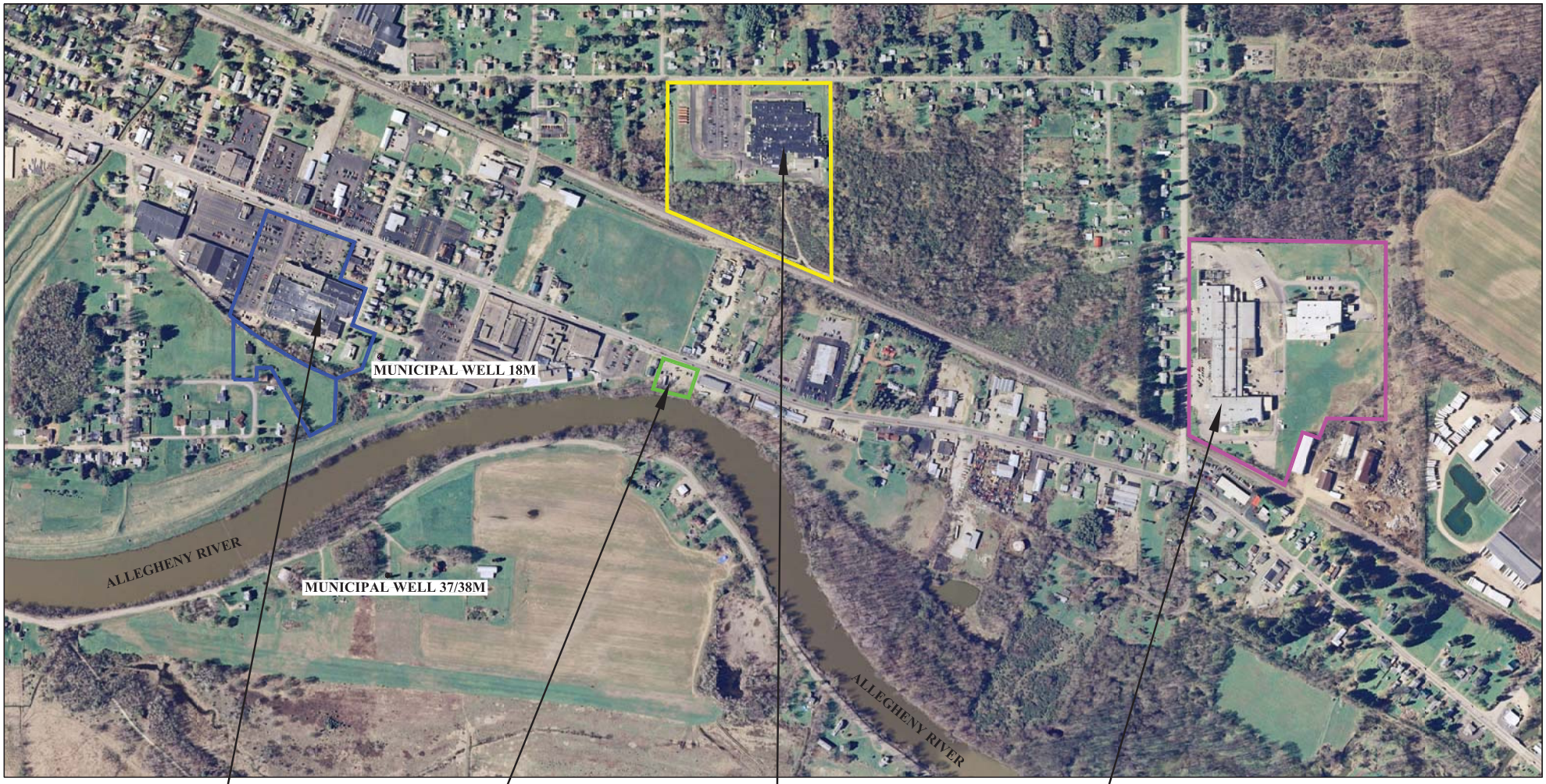
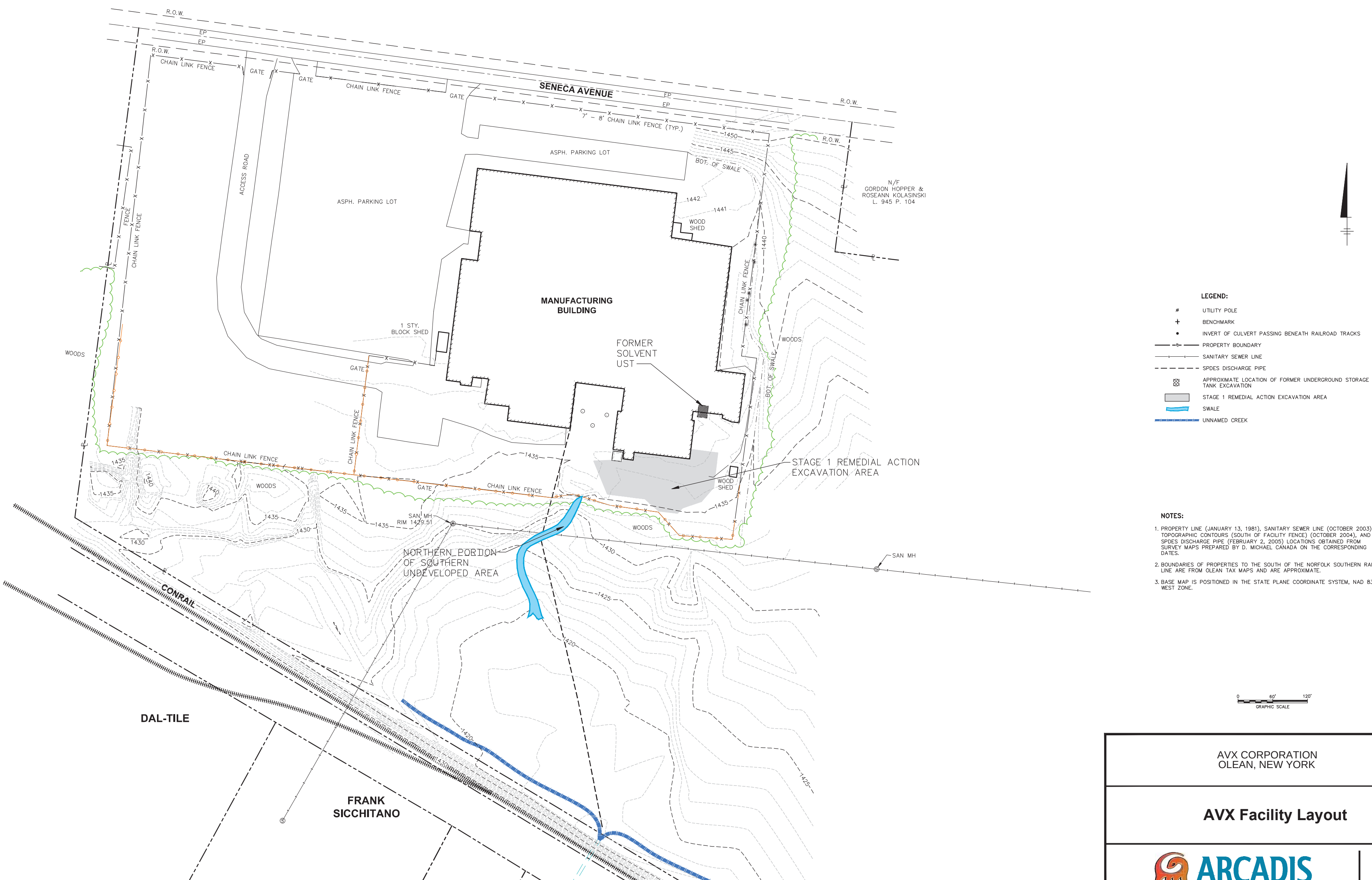


FIGURE 1

SITE LOCATION MAP

OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

DRAWN BY:	DATE:	PROJ. NO.
MWW	09/24/2014	137-196



LEGEND:

- UTILITY POLE
- BENCHMARK
- INVERT OF CULVERT PASSING BENEATH RAILROAD TRACKS
- PROPERTY BOUNDARY
- SANITARY SEWER LINE
- SPDES DISCHARGE PIPE
- APPROXIMATE LOCATION OF FORMER UNDERGROUND STORAGE TANK EXCAVATION
- STAGE 1 REMEDIAL ACTION EXCAVATION AREA
- SWALE
- UNNAMED CREEK

NOTES:

1. PROPERTY LINE (JANUARY 13, 1981), SANITARY SEWER LINE (OCTOBER 2003), TOPOGRAPHIC CONTOURS (SOUTH OF FACILITY FENCE) (OCTOBER 2004), AND SPDES DISCHARGE PIPE (FEBRUARY 2, 2005) LOCATIONS OBTAINED FROM SURVEY MAPS PREPARED BY D. MICHAEL CANADA ON THE CORRESPONDING DATES.
2. BOUNDARIES OF PROPERTIES TO THE SOUTH OF THE NORFOLK SOUTHERN RAIL LINE ARE FROM OLEAN TAX MAPS AND ARE APPROXIMATE.
3. BASE MAP IS POSITIONED IN THE STATE PLANE COORDINATE SYSTEM, NAD 83, WEST ZONE.

AVX CORPORATION
OLEAN, NEW YORK

AVX Facility Layout

ARCADIS

FIGURE
2

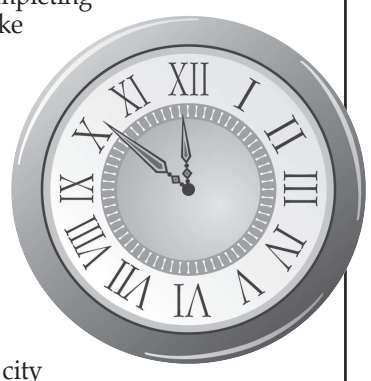
Appendix V – Attachment 2

Public Notice – Commencement of Public Comment Period

Turning Back the Clock

1915

June 16 — Jack Williams, known as the human fly, made 3,000 Oleanders stand astounded as he climbed up the side of the new First National Bank Building, using nothing but his hands and feet for the climb and having absolutely no protection against falling. The former Olean bellhop has been around the country for the past five years or so, completing similar stunts at locations like the Harrisburg, Pa., Capitol Building. He collected $42.60 from the crowd, many of whom thought him a flimflammer before his daring climb.



June 19 — Blaring whistles, ringing fire bells, the tooting of auto horns and even a band ring in the results of a public referendum, which authorized the city to raise $150,000 on a bond issue to build flood control dikes around Olean. The Evening Times — which had published editorials asking voters to authorize the major undertaking — carried the front-page headline "Flood Abatement is Carried by Big Vote Intelligently Cast." Of the 1,397 voters who went to the polls in the special election, 1,156 cast in favor of stemming the tide of flooding, which has plagued the city since its founding.

June 19 — A meeting of the Interstate League's Olean and Wellsville teams led to a "fistic" assault on an umpire. Wellsville declared against one of Umpire Donovan's decision in the bottom of the first, and Manager Lohr and Catcher Rodgers struck him from behind. After Rodgers was banished to the bench with team Captain Apple, who insisted on continuing the argument, the game was continued under protest. The Olean White Sox defeated the Wellsville squad 3-2, leaving the teams tied in the standings for the league at 16-8.

1940

June 18 — For the first time, Olean's business district will have parking meters. Crews have begun drilling holes in the sidewalks for 350 such contraptions, with the first 50 units expected to arrive tomorrow from the manufacturer. How much will it cost to park? Will there be a charge during the evening hours? How about weekends? The final details are still being worked out by the Common Council.

June 18 — The embattled Olean Oilers are back in the PONY league cellar, hoping this evening's Ladies Night game against the Hamilton Redwings will reverse their fortunes. But they'll do it without Blanco Smith, the league's leading circuit clouter with 10 to date. He was struck in the head last night by a fastball in Batavia. Knocked unconscious by the pitch, he was rushed to the hospital where an X-ray revealed a skull fracture.

June 19 — The worst flood in the history of Cattaraugus County, according to long-time residents, was the one that struck Ellicottville in the wake of a furious cloudburst. Damage was tentatively estimated at $150,000, as debris-littered streets, washed-out bridges and ruined crops stand as mute evidence in the towns of New Albion, Otto, Mansfield, Ellicottville, Leon and Cattaraugus, the latter the worst-hit.

1965

June 15 — Mayor Edward Hustead drove the golden spike initiating the passenger runs on the one-mile-long "Boomtown Special" narrow-gauge railroad at Montgomery Shoemaker's Cloud 9 Park. The gasoline-powered locomotive took the mayor and others a mile around the brow of Mount Hermanns to Gusher City, an under-construction addition to the park. Shoemaker said a big portion of the town should be completed by July 4.

June 17 — The first highly radioactive nuclear fuel assemblies have arrived at the West Valley plant of Nuclear Fuel Services Inc. The uranium dioxide pellets arrived by truck from Massachusetts in a 23-ton lead cask with no public announcement or access "for security reasons," officials said, and the fuel will sit in a "cooling off" pool for the next five months. The plant, now 97 percent complete, will be tested this winter and fuel reclamation should begin early next year.

June 18 — There was standing room only in the council chambers of Olean's Municipal Building as state officials conducted a public hearing on the Allegany-to-Cuba section of the Southern Tier Expressway. Although some residents of Allegany and the Homer Hill section of Olean suggested alternate routes, a spirit of cooperation prevailed at the meeting, with none denouncing the project as a whole. The proposed 17.5-mile, $24 million section of four-lane will connect West Five Mile Road in Allegany to Route 305 just north of Cuba, with Olean officials planning to connect Homer and North Union Streets together to allow highway access.

1990

June 17 — The ruckus of an early-morning coyote howl is becoming ever-more-common in the Southern Tier, wildlife experts report. There would be more, if not for mange infections, the DEC reports, but several farmers are reporting the crafty canines circling cattle herds and chicken coops, but most people won't see them unless they go looking for them. Strangely, the Eastern coyotes are slightly larger than the western varieties, whether through interbreeding with large domestic dogs or other means.

July 17 — Soccer is becoming more than just a summer diversion, with more than 4,000 boys and girls expected to play in the new Southern Tier District Youth Soccer League in 16 communities about twice as many as who are playing midget or pony football this season. As recently as 1978, finding an organized youth soccer league was virtually impossible in Cattaraugus and Chautauqua counties, and up until the 1980s, the number of teams in the area could be counted on two hands.

June 19 — Non-Indian landowners on the Allegany Territory outside of Salamanca are up in arms over proposed 99-year lease terms currently under negotiation. One resident reports the lease on her 0.45-acre homestead would cost almost $1,000 a year — more than all of her property taxes combined — while a neighbor with 2.6 acres would see a payment of under $500. Currently, the alternatives to paying the lease include sale at market value to the Seneca Nation of Indians or going to arbitration. Under the proposal, landowners in the towns of Carrollton, Vandalia and Great Valley would pay about $49,000 a year, compared with the $800,000 accepted by a committee representing Salamanca landowners.

(Compiled by editor Bob Clark/Olean Times Herald)

Positive vibes for finals week

1,000-plus Post-its plastered around Olean Intermediate

By KELSEY BOUDIN
Olean Times Herald

OLEAN — Many Olean Intermediate Middle School students were likely surprised upon coming to school today.

The halls are adorned with more than 1,000 motivational Post-it notes — one at each of the roughly 700 lockers and elsewhere throughout the building, including bathrooms — in hopes of boosting the kids' confidence entering finals week, said English teacher Eileen Skrobacz.

"When kids go to their lockers, they're going to get a little boost," Skrobacz said Sunday. "If they leave them up every day, they'll see that, they'll read each other's, and it'll just be a little inspiration for that last charge for the end of the school year, to stay strong.

"These are 20 percent of their final grades, so these are important tests."

The red and yellow notes include sayings like: "You can if you think you can!" and "When you feel like quitting, think about why you started!" Others are more geared toward life in general, Skrobacz explained, noting one that just says, "Smile!"

"It's just to try to be happy today, try to relax a little bit, love the minute while you're living it," the teacher added.

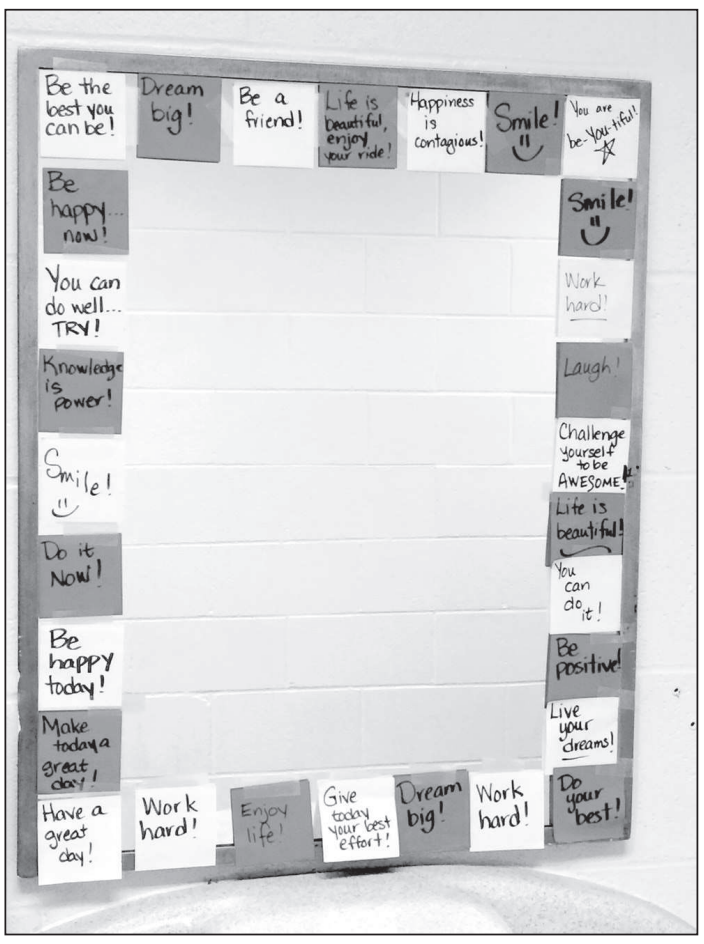


Photo submitted

A mirror at Olean Intermediate Middle School displays positive, confidence-building phrases and quotes for students as they begin taking final comprehensive exams this week. More than 1,000 Post-it notes have been placed on lockers and throughout campus halls.

She was particularly looking to inspire the sixth-grade class on its first round of comprehensive finals.

"It's new for them," Skrobacz said. "It'll hopefully kind of calm them down and help them focus."

The fourth- and fifth-grade students at OIMS won't take those finals, but they won't miss out on the positive vibes.

"We have a lot of lockers. … We wanted to make sure everyone had something," Skrobacz said. "It's an encouragement for them to finish the school year strong, too."

During ninth period study halls in recent weeks, Skrobacz said, some seventh-grade students would go to her room to look up inspirational quotes and kind sayings for the Post-its.

"It probably took us a month of ninth periods to do it," she added. "We tried to have as many different quotes as possible, so when they even read each other's, it's a little boost."

(Contact reporter Kelsey Boudin at kboudin@olean-timesherald.com. Follow him on Twitter, @KelseyMBoudin)

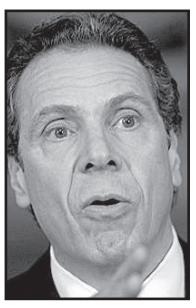
Cuomo looks forward to Route 219 bridge work

Gov. Andrew Cuomo late last week became the latest elected official to comment on the agreement the state has reached with Erie and Cattaraugus counties for the construction of a new bridge over Cattaraugus Creek on old Route 219.

A press release from the governor's office estimated that 280 new, "well-paying" jobs will come to the area when construction begins.

"This bridge is a crucial, but aging, piece of infrastructure for Erie and Cattaraugus county residents, and with today's commitment we are going to ensure this stretch of old Route 219 remains safe and drivable for decades to come," Cuomo said. "I look forward to seeing the project, which will also bring jobs and economic growth to the region, get underway."

New York State Department of Transportation Commissioner Joan McDonald said state officials "worked diligently" with county leaders to reach a resolution on the maintenance and ownership of the South Cascade-Miller Road Bridge over Cattaraugus Creek, which serves as a transportation link between Cattaraugus and Erie counties.



Gov. Andrew Cuomo

"Maintaining this important bridge crossing helps preserve the identities of the surrounding communities and protect their economic future," she said. "The South Cascade Drive-Miller Road Bridge will continue to serve as an important transportation link and conduit for the local economy, creating jobs, enhancing mobility and providing safe and reliable travel for years to come."

The new bridge is expected to have a life span of approximately 75 years.

Upon completion of the bridge, the state will transfer maintenance responsibility to Erie and Cattaraugus counties. Maintenance is expected to be "minimal," according to Cuomo, and the state has secured $300,000 in funding as part of the 2015-16 enacted budget for a county-run maintenance fund. This funding is separate from the estimated $20 million in construction costs that the state is assuming.

Additionally, the state will assume the cost for construction of cable conduits along the bridge at an estimated cost of up to $50,000 and will pay for the first 10 years of washing the bridge.

"I applaud the Cattaraugus and Erie County governments, and Gov. Cuomo, for their diligent work to green light the old Route 219 bridge replacement," said State Sen. Catharine Young, R-Olean. "Construction of a new, state-of-the-art bridge will be extremely beneficial to Western New York because it will stimulate economic growth by creating new, good-paying jobs and providing greater access to broadband service, preserve the local economy, and give residents on both sides of the Cattaraugus Creek access to emergency care and shopping they need and deserve."

Construction of the new bridge should take approximately two years. Work on the project is likely to begin late this summer.

The state voluntarily assumed responsibility for maintenance of the existing bridge in 2010 at the request of both counties following the opening of the four-lane bypass on the current Route 219, according to Cuomo.

Appendix V – Attachment 3

June 23, 2015 Public Meeting Sign-In Sheets

Olean Well Field Superfund site
AVX Area

PUBLIC MEETING
7:00pm on Tues., June 23, 2015

SIGN IN HERE

Cutco Theater
260 North Union Street
Olean, NY

First Name	Last Name	Suffix
NORM	DEGROFF	

☐ DO NOT ADD TO MAILING LIST

Address: (b) (6)

City

Organization: RES

First Name	Last Name	Suffix
JOSEPH	GIARDINI JR	

☐ DO NOT ADD TO MAILING LIST

(b) (6)

Organization: Renter

First Name	Last Name	Suffix
Sheila	Morgan	

☐ DO NOT ADD TO MAILING LIST

(b) (6)

Organization: Renter

First Name	Last Name	Suffix

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street | Apartment/Unit

City | State | Zip code

Organization | Email Address @

First Name	Last Name	Suffix

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street | Apartment/Unit

City | State | Zip code

Organization | Email Address @

Olean Well Field Superfund site
AVX Area

PUBLIC MEETING
7:00pm on Tues., June 23, 2015

SIGN IN HERE

Cutco Theater
260 North Union Street
Olean, NY

First Name	Last Name	Suffix
MAURICE	MOORE	

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit
270 Michigan Ave	

City	State	Zip code
Buffalo	NY	14203

Organization	Email Address
New York State Dept. Env Cons.	MAURICE.MOORE @DEC.NY.GOV

First Name	Last Name	Suffix
Stanley	Wesley	

☐ DO NOT ADD TO MAILING LIST

(b) (6)

Organization

First Name	Last Name	Suffix
Dan Wells		

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit

City	State	Zip code

Organization	Email Address
Time Warner Cable News	buffalo@twcnews.com @

First Name	Last Name	Suffix
Gary	Swain	

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit
4746 Summit Hill	

City	State	Zip code
Machias	N.Y.	14101

Organization	Email Address
IUOE Local 17	gSwain @iuoe-17.com

First Name	Last Name	Suffix
Richard P. Weber	SR.	

☐ DO NOT ADD TO MAILING LIST

(b) (6)

Organization

Olean Well Field Superfund site
AVX Area

PUBLIC MEETING
7:00pm on Tues., June 23, 2015

SIGN IN HERE

Cutco Theater
260 North Union Street
Olean, NY

First Name	Last Name	Suffix
Eric	Wohlers	

☒ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit
1 Leo Moss Drive	

City	State	Zip code
Olean	NY	14760

Organization	Email Address
Cattaraugus County Dept. of Health	ewwohlers @ cattco.org

First Name	Last Name	Suffix
Robert	LaForge	J

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit
618 Grand View Ave	

City	State	Zip code
Olean	NY	14760

Organization	Email Address
NYSFFC	rlaforge@myfaircontracting@.org

2

First Name	Last Name	Suffix
JOHN	CALDWELL	

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit
154 PORTVILLE/CORY RD.	

City	State	Zip code
PORTVILLE	NY	14770

Organization	Email Address
AVX	JOHN.CALDWELL @ AVX.COM

First Name	Last Name	Suffix
Andrew	Cooper	

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit
712 Division St	

City	State	Zip code
Olean	NY	14760

Organization	Email Address
AVX	Andrew.Cooper @ AVX.com

First Name	Last Name	Suffix
Rick	Miller	

☐ DO NOT ADD TO MAILING LIST

Address: Number and Street	Apartment/Unit
Olean Times Herald	

City	State	Zip code

Organization	Email Address
	@

Appendix V – Attachment 4

June 23, 2015 Public Meeting Transcript

OLEAN WELL FIELD SUPERFUND SITE

AVX PROPERTY

PUBLIC MEETING

Taken at 160 North Union Street, Olean, New York on June 23rd, 2015 at 7:00 p.m. ending at 8:09 p.m. before Angelle C. Phillips, Notary Public.

APPEARANCES:

MICHAEL BASILE,
Community Involvement Coordinator

LORENZO THANTU,
Remedial Project Manager

MR. BASILE: Good evening. My name is Mike Basile, I'm with the Environmental Protection Agency, I'm a community involvement coordinator and I'd like to welcome you to the public meeting this evening. We're here to present to you the proposed plan and the justification behind the proposed plan for the AVX property.

We have a stenographer here to capture all of our comments and your comments. Questions and answers will be held at the end of the meeting. There's only going to be two speakers this evening, both myself and our project manager, but there are a few people that are in the audience that I'd like to introduce, they're a part of our team. And at this time I'd like to introduce Sharon, Sharon is with EPA our regional office in New York City and Sharon is the site attorney for the Olean Well Field, Sharon Kivowitz right here.

Also in the audience the New York State Department of Environmental Conservation, Maurice Moore out of region 9 in Buffalo.

Region 9 encompasses the Western New York area. And another partner, the Cattaraugus County Health Department, Eric Wohlers.

We're in a 30-day public comment period which began on June the 15th and will end on July 15th. Your comments this evening will be placed in the record as a result of us having a stenographer present. And I ask that during the question and answer period we have a portable microphone, I'm going to ask you to stand, I'll bring the microphone to you, we'll need the spelling of your first and last name for the record and then you'll be able to ask the questions of our agency, EPA. Or possibly even the state and Cattaraugus County Health Department.

We have established a web site and the web site is on your agenda, the proposed plan has been posted to the web site. The presentation, the power point presentation that you'll see this evening, tomorrow will be posted to the web site as well. So, I mean, you're free to take notes, but this

presentation this evening will be posted to the Olean web site tomorrow.

We are going to be taking comments. If you leave this evening's meeting and think of something, as long as you can send it to Lorenzo, our project manager, and his name and address is in the bottom of the agenda, that will be accepted until July the 15th, at which time we will cease public comments. And, of course, the stenographer will be taking down any comments that you have this evening for the public record as well.

We've established a repository in your community and it's at the Olean Public Library and all documents are available there as well as this proposed remedial action plan. So at this time I'd like to call upon our superfund remedial project manager, Lorenzo Thantu with region 2 who will make the presentation this evening. I ask that you hold your questions until he's completed his presentation. Thank you.

MR. THANTU: Thank you, Michael. Can

everyone hear me okay? I have about 32, 33 slides and I want to limit my presentation to about 25 minutes so that we can spend more time during the Q and A where you will be asking questions of us. And if you should have questions on any of the slides, I can go back to the slides and go to the questions.

So I thought I would spend about 25 minutes just to bring you up to speed first superfund remedial process, the history of the Olean Well Field Superfund Site, the feasibility study investigation or FSI results that we got a couple years ago and finally the objective of tonight's meeting, the remedies that we looked at in the proposed plan and the preferred remedy that we are proposing to you.

First a little bit of history on superfund. Superfund is also known as CERCLA which stands for Comprehensive, Environmental, Response, Compensation and Liability Act. It was an act that was passed by congress in 1980 which created superfund that allowed EPA to clean up contaminated sites nationwide and

under this program we get the federal funding that's needed to clean up toxic waste or contamination associated with them.

And in order for a site to become eligible for federal funding it has to be listed on what's known as the national priorities list. And Olean Well Field Superfund Site was listed on the NPL in September 1983. So from that time on EPA took over the lead of addressing contamination at the Olean Well Field Superfund Site.

This -- excuse me for a second, Michael, I forgot to ask you for a laser pointer. Any ways, this figure shows you the Olean Well Field Superfund Site, it's about 1.5 square miles and through all the investigations that we did in the 1980s we discovered four companies, which we call four source areas, are contributing to the groundwater contamination at the Olean aquifer well field.

The first one on the left is Alcas, the second is Loohn's Dry Cleaner and AVX Corporation, which is the subject of tonight's

proposed plan and Cooper Industries. As you see from the figure all the four source areas are located north of the Allegheny River.

And quickly going over the superfund remedy selection process. First the national priorities list, as I said earlier, Olean Well Field Superfund Site was listed on the NPL in September 1983. Superfund process consist of removal and remedial. Removal addresses all the emergency situations where the threats must be addressed immediately and we rely to address those through the removal program and then we have the remedial program, which is a long-term remedial process that entails the following steps that I will be going through.

First we need to find out what the nature and extent of contamination is. To do that we conduct remedial investigation and based on the results of the remedial investigation we look at the contamination and we look to see what technology would be best suited to address them and clean them up and that's the feasibility study, RI/FS. RI/FS has been

completed for the AVX source area component of the Olean Well Field Superfund Site.

Then after that we come to the proposed plan, that's where we are tonight and I will be going over that proposed remedy. And then once we go through the proposed plan after we go through comment period we come upon record of decision, ROD. ROD spells out in details how the site is going to be cleaned up. And then once the ROD has been issued, we go to the next step actually doing the remedial design of the remedy that was selected.

Once design has been completed, we go through remedial action that's simply the construction of the remedy that was just designed. And once the construction of the clean up has been completed, EPA still stays involved to make sure that the clean up that was implemented remains protective of human health and the environment, that's why we go through operation and maintenance.

Oftentimes when we have a groundwater treatment system even though we have completed

the construction, the groundwater treatment system has to operate for like 10, 15, 20 years until all the groundwater remediation goals have been met, so that would be another form of OMM that a remedy that was constructed would have to go through.

So for the Olean Well Field we first found out about Olean Well Field in 1981 when the three supply wells 18M, 37 and 38M were found to be contaminated with volatile organic contaminants. And they were also discovered in nearby private residential wells. So EPA started working with New York Department of Health Environmental Conservation and New York State Department of Health to develop plans to provide safe drinking water supply options to the community was that being affected. And based on all our investigations we have done in 1985 we signed a first record of decision for the Olean Well Field Superfund Site.

Part of the cleanups we did per the ROD was we put on a stripping system on the well head of those three supply wells. So since

19 -- that was completed in the late 1980s. Since then the air stripping treatment system has been working effectively, the water that's treated meets all the federal and state drinking water standards.

And then second ROD in 1996, sometime in 1996 we issued a second record of decision on the four source areas that I just identified on that figure, Alcas, AVX, McGraw-Edison and Loohn's Dry Cleaner. And the 1996 ROD required clean-up actions at all four source areas and all of them are still in progress.

And we are here tonight to discuss only the AVX property to which the proposed plan contains. So here's the map again and Alcas is right here, Loohn's Dry Cleaner is here, AVX is here and Cooper Industries and over here is Conrail Rail Tracks.

So a little bit of history on AVX. AVX is a semiconductor company that manufactures electronic components such as electric electrical capacitor and then their client in the military and space industries. So because

of the company being a semiconductor company and manufacturing is very, very sensitive to vibration and dust and it runs 24/7, it's been operated 24/7 to the present since 1950.

And historically at AVX they have used various types of chemical solvents, primarily trichloroethene TCE, 1, 1, 1 trichloroethane, 1, 1, 1- TCA and tetrachloroethane PCE. And because of certain disposal practices that took place decades ago, all that resulted in contaminating of soil and then contamination leach through that to groundwater, that's how the Olean Well Field aquifer got impacted.

And let me just quickly tell you, give you more description of AVX property. AVX property is about 18.5 acres in size and over here is the chain link fence in which is a manufacturing building which is about 50-, 60,000 square feet in size. And then the property runs all the way to just north of the Conrail Rail Track. So outside of the southern perimeter fence all around here is wetlands and wooded area and I'll explain to

you later on in another slide what this blue soil is.

So the first remedial action for AVX per the '96 record of decision took place in July 2000. AVX excavated about 5,000 tons below ground surface and shipped it off site to an EPA approved facility. And the excavation had to come to a halt because it got into interference with the manufacturing of the building.

If excavation had continued on it would have impacted the structural integrity of the building, so we halted the excavation activities at that time. And over here is where the stage 1 remediated area was, it's just to the southeastern corner of the manufacturing building, about 5,000 tons of contaminated soil was taken out here.

Let me spend a minute or two about the lithology of the subsurface foundation in the area. At the Olean Well Field Site facility we have three main geologic formations. Going from top to bottom you have upper aquifer,

upper aquitard, lower aquifer and lower aquitard. Aquitard is a formation that has very limited permeability, so it doesn't have much capacity to hold groundwater.

At the Olean Well Field Site drinking water comes from the lower aquifer, which is called the city aquifer. And at the AVX site of these four aquifers, upper aquifer is almost nonexistent. So the upper most aquifer that you see at AVX would be the upper aquitard till unit, which is quite impermeable, it stands down about 30 feet, 45 feet and there is a lower that is city aquifer from which most of us in the City of Olean get their drinking water from.

So what we did after the 2000 remedial action we embarked on a series of multi-phase investigation, some by EPA, others by AVX. Other investigations took place between 2000 and 2012, that resulted in the culmination of the recent finalized feasibility study investigation report in January 2013. A lot of the information and the alternatives that

we have evaluated in the proposed plan is based on the findings of this January 2013 feasibility study investigations report. So what results from this FSI told us is that there were like nearly discover highly contaminated areas that we were not aware of back in 2000 and prior to 2000.

The first area is beneath the southeastern portion of the AVX manufacturing building and the second area is the undeveloped area of wetlands south of that fenced property that I just went over. That also includes this drainage soil that was found to be highly contaminated. And third is we also found contamination on the other side of the Conrail rail road track, that is off property from AVX.

We don't know where that contamination is coming from, so EPA is initiating a separate investigation using superfund money to look into that. So, again, this figure -- this figure is pretty much the same as the last two figures, but I renamed it to AVX Historical

Source Area. This is the fine term that we came up with in the January 2013 feasibility study investigation report. What we found out with respect to high contamination found on AVX property we found out that historical source area was located in the southeastern corner of the manufacturing building and just to the east and north of the manufacturing building. And also we discover additional significant contamination, in particular groundwater contamination in this drainage soil that you see in this blue shaded screen like shape. And down here is the -- again, Conrail rail road tracks.

So what we have done for the proposed plan is we have identified or developed remedial action objectives. Remedial action objectives, the purpose of them is to meet -- protect human health and the environment. And for the groundwater remedial actions we have identified three RAOs, the first is to restore the city aquifer, which is partly contaminated beneath AVX property to drinking water

standards.

And second is to minimize, contain and/or eliminate remaining soil contamination that is at AVX property that continues to impact the underlying groundwater aquifer, in particular city aquifer. And the last one is we are also minimizing and eliminating any potential for human exposure for site contaminants due to inhalation of volatile organic compound vapors or coming into contact with contaminated groundwater.

Similarly we have also established remedial action objectives for soils. The first is to minimum, contain and/or eliminate contaminants from soil leaching into the underlying aquifer groundwater. And second as with groundwater medium action objective to minimize eliminate the potential for human contact with volatile vapors or coming into contact with contaminated groundwater.

So what we have come up with is we have evaluated in detail three sets of remedial alternatives for three remedial action areas

at the AVX property. The first one is the historical source area, the second one is downgradient till area and the third is city aquifer, as you will see in the next few slides.

For the historical source area we looked at four alternatives, the first one is no action. In Superfund program EPA is required to have no action alternatives absent any remedial action so that we can compare that to other active or action remedial alternatives. So obviously the capital cost and preset-worth cost would be 0 in terms of the cost. The cost estimation that we have down include capital cost, annual operation and maintenance cost and present-worth cost.

Present-worth cost essentially total cost to implement that remedial alternative over time in today's dollars so we can compare all the cost numbers to each other on the same scale. The second one is hydraulic trench containment -- I'm sorry, I skipped a few slides bear with me a second.

First one is remedial action for historical source area. The second one is an exposure barrier, an exposure barrier simply relies on the existing surface trauma at the AVX property. That would consist of the building, asphalt pavement and the vegetated area, but AVX would be putting in place a rigorous maintenance program to make sure that, for example, the integrity of the asphalt cap is maintained such as if there were cracks, they would be repaired. So the purpose of that is to prevent any potential dermal human dermal contact barrier. It would prevent any kind of dermal human contact. And the cost of that, total cost would be about $630,000 and time to implement would be about three months.

And third one is in-situ thermal remediation that is conducting a thermal remediation in place in acceptable areas using electrical heating resistance or electrodes by running current through them, temperature will be about 103 celsius and then that would

volatilize the organic chemicals and soils and also groundwater. And then when they come up they would be captured by above-ground vapor recovery system treatment. And the total cost of that is about 3.3 million dollars and construction time is 12 months.

Then the last one for historical source is in-situ multi-phase extraction and that is applying a series of extraction wells to vacuum. So you suck up all the organic chemicals that would be volatilized to above-ground treatment system. And the cost for that is about $2 million and construction time is about 10 months.

Now, the second remedial action zone downgradient till groundwater area, no action all zeros. The second alternatives for hydraulic trench containment that is to put in place a hydraulic trench instead of a vertical ground system because in this area the aquifer is made up of very impermeable till materials. So because of that we would be putting in a trench which is about 200 feet in length, 2

feet wide and 25 feet deep. And the cost of that is about $2 million and the construction time about five months.

And third one for downgradient till unit is the permeable reactive barrier dimensions will be the same as the hydraulic trench containment about 200 feet in length, 25 feet deep and about one inch think instead of 2 feet for the hydraulic trench. Basically with a permeable reactive barrier you would put in this trench a mixture of reactive materials called zero-valents, iron and sand.

The limitation with this alternative is that it would not address or treat all of the contaminants that have been identified at the AVX property. The cost is about $1 million, it's half of hydraulic trench containment, construction time is about four months.

Finally the last remedial action area city aquifer no action it's all zero and the second alternative is hydraulic pumping containment. This would rely on the existing well that's been operating for the last five, six decades

and we would rely on that to continue running, but we would require AVX to make some adjustments to it to make sure that the plume and the city aquifer is contained, does not migrate further south of the Conrail rail road track. The total cost of that is about $1.4 million, construction time zero.

So all these active action alternatives have these three common components, long term monitoring to make sure that selected interim remedy remains effective by putting a new monitoring well if required, et cetera.

Second component institutional controls or ICs, that would be an IC plan would be developed that would make sure that certain specific institutional controls, for example, deed restrictions would be put in place to limit groundwater and soil use. For example, with respect to soil use, AVX property would have to remain commercial, industrial. It would not be used for other scenarios like residential, that would be prohibited.

And, finally, the site management plan

that's just to make sure that the construction that was implemented stays protected of human health and the environment, and that would also include management and monitoring of institutional controls and also to see if there's any potential for soil vapor intrusion at the AVX property.

So finally what we have done is we looked at all these alternatives and we compare them against these nine criteria, with the exception of community acceptance, you know, we won't know that until after we have gone through the public comment period. So we evaluated all of the alternatives and compared them against each other against the first set of criteria overall protection of human health and the environment. Compliance with applicable or relevant and appropriate requirements, it would include all the regulation and acceptance at federal, state and local government levels.

Long term effectiveness and permanence, reduction of toxicity, mobility and volume.

Short term effectiveness, how long it would take for the alternative to achieve its goals and during that time what the risks might be to the workers and the community. Implementability, how implementable is the alternative looking at the technical and administrative feasibility of the alternatives and cost, which I just went over, state acceptance. We know that New York State DEC has concurred on this proposed plan. Community acceptance we'll find out in the next few months.

So after consulting with New York State DEC, they put the list of three alternatives that EPA proposes as the agency's preferred remedy. For the historical source area we are recommending expose barrier. Downgradient till unit, hydraulic trench containment. And city aquifer hydraulic pumping containment relying on the existing reduction well at AVX.

So in conclusions, we find this preferred remedy to provide the best balance of trade-offs between all the alternatives that

we have looked at in the feasibility study and also culmination of the three alternatives will be protective of human health and the environment in the short term until the final clean-up remedy is selected for AVX.

So I want to reiterate that this proposed plan is interim remedy for modification because as I said earlier, we could not do full excavation because of the existence of the building. We determined that it'd be best to have this limited scope interim action until further down the road when we can do a full evaluation of how we can get to that full restoration of the impacted groundwater.

So this preferred remedy would meet all the federal and state requirements and also is cost effective as compared to other combinations that we have looked at in the feasibility study. So, finally, here's the break down of all the cost again for the preferred remedy. Total cost is almost $4 million, exposure barrier $630,000, hydraulic trench about $2 million and hydraulic pumping

containment is about $1.4 million. And I guess back to you, Michael.

MR. BASILE: Thank you, Lorenzo. We do have a stenographer present this evening, Angelle Phillips. And I'm going to ask if you have a question I'll bring the microphone to you and I ask the spelling of your name and you can ask the question to any of our presenters. Questions? Yes, sir.

R I C H A R D W E B E R

290 North Clark Street, Olean, New York 14760

RICHARD WEBER: I worked at AVX 1981 through 1984 and at that time we used TCE, we used it for degreaser or when we got dirt on our hands or on our clothes, we used the chloroethane to wash it off. We were never notified of this carcinogen. You read the TCE tells us 30 years down the line someone will get cancer. Well, within the last 10 years 12 people from AVX have died terrible deaths, brain tumors, there's people in the

neighborhood who died of cancer. My question is in 19 years they interrogated three wells, well where did it go? Okay, where did it go? Why is it gone? Now we're going to do another five-year plan, there's a lot of questions. Do you read the TCE? Google it, Google Sun Times, Myrtle Beach, they're done, hundred million dollar clean-up.

Okay, they close this it's going to be 77 million clean-up. Okay, so what are we going to do wait five more years, 10 more years? It doesn't make any sense. You got to clean it up, clean it up now, but also is it underneath my property? I'm 350 feet from the property line, is it under my house? Is it under his house? Is it under his house? He lives on the other side of AVX, so that's my question.

MR. THANTU: I was thinking to myself if you wanted an answer on that, you want to put that on record, but to a degree I do hear what you just said and that's really the history of the operation that took place at the site. And if you're talking about TCE, you know,

definitely is up there as high, you know -- to what degree the carcinogenic designation --

RICHARD WEBER: They pump it in the ground, I watch them put it in the tank.

MR. THANTU: First, I don't know where you live, sir, in relation to AVX property to answer your other question whether you might be sitting over a contaminated plume.

MS. KIVOWITZ: But we did do soil vapor studies and we did invite people to participate in those studies.

RICHARD WEBER: Did they core sample anybody outside the line?

MS. KIVOWITZ: Well, they have done soil vapor studies to determine whether or not --

RICHARD WEBER: Did they go into the ground underneath the ground?

MS. KIVOWITZ: Under your houses? No, I don't believe they did.

RICHARD WEBER: Why not?

MS. KIVOWITZ: If there's no soil vapor --

RICHARD WEBER: Okay, wait a minute, in

Myrtle Beach this contamination went for miles.

MS. KIVOWITZ: But you can't compare, you know, we can't speak to what occurred in Myrtle Beach, we don't know anything about that.

RICHARD WEBER: We want to know about our properties where we live.

MS. KIVOWITZ: I think the best thing we can do is take your address, I think you signed in, and to take your address and to see whether you were part of that study and we're going to be doing another vapor intrusion study.

MR. THANTU: Correct, as onset in this proposed plan part of the remedy is to look into any potential for soil vapor intrusion including the AVX property. And as Sharon said over the years, I think it was like between 2010 and 2012 we did embark on a major initiative to do vapor sampling, sub slab sampling to see if there is any vapor beneath your foundation slab and indoor air sampling.

My recollection is that between 2009 and 2011, 2012, we only got about 36 or 40 homes that agreed to EPA coming into their homes to do this sampling. See many homes said no because they didn't want EPA to make a hole through their basement foundation slab.

RICHARD WEBER: I have been there since 1999, nobody knocked on our doors.

MR. THANTU: But as Sharon said, definitely please do give your address to Michael at the end of the meeting.

MR. BASILE: We have his address.

MR. THANTU: We would love to include your home when we do our next round of vapor sampling in the area.

MS. KIVOWITZ: I just want to also address the first point when you asked where the vapor is going when they extract it, there are air strippers, there is equipment on those city municipal wells that is stripping out the contaminants and it goes into a carbon system and then the carbon gets changed out, I believe that's the system that's on there. So

those pollutants are not going into the air from the pumping of the groundwater level.

RICHARD WEBER: How about underground?

MR. THANTU: Whether your house might be situated over some impacted plume that's why I asked you where you lived, you know, so once we find that out we will be able to tell if you might be a potential risk or at least whether your home warrants this vapor sampling.

UNIDENTIFIED SPEAKER: Lorenzo, could you put the map on the screen? That would be helpful.

MR. THANTU: You're referring to the first figure the figure that shows all four source areas?

J O S E P H G I A R D I N I

1312 Seneca Avenue, Olean, New York 14760

JOSEPH GIARDINI: My name is Joseph Giardini, G-I-A-R-D-I-N-I, I have two questions. I have been living at 1312 Seneca

Avenue for the last 15 years, my only concern is there is a lot of wildlife there, we have deer coming in the three and a half acres that we have, if it's -- this groundwater if it happens to be contaminated, you work with your EPA wildlife or whatnot, would it have any kind of effect on wildlife if you were to actually -- I mean, we actually shun people to get out of the back because we thought they were shooting deer in the city limits. If you were to take a deer with the proper authority, could you test the deer to see if something -- any carcinogens or anything are in that, you know, I'm just curious. I mean, that would be one way to see, I mean, the deer come up to the house, they go across and they go all the way up the next street over.

And my other question is if they extracted 5,000 -- over 5,000 tons of contaminated soil, there would be up to like about 250 tri-axles or even bigger at 20-ton a piece would be 4,000 ton and if they say that the -- if it is contaminated, which we already know that it

is, the marrow grade does not act as a dam. 550 yards across State Street or both 17, the only place that was actually that came in EPA and we will drill holes in the floor, they drilled seven test holes, my buddy ended up buying the building in good faith the dry cleaner place and in four months the whole building was completely eliminated. And there's probably 500 semi loads, tractor trailer loads extracted until it got down to the riverbed and extracted and shipped to Michigan and now the lot is vacant. And it went back to the Cattaraugus County on the tax roll and they actually bought the parcels of property back between the two businesses that were in business striving to do something and they bought a junk piece of property.

Now you're telling me that not even a half a mile away across -- all the people that contaminated this place for years, Olean Tile, McGraw-Edison and now you're getting a clean review that you're going to do the right thing and clean up this place. Well, the Zoladz --

I don't understand what this is all about -- about AVX doing the right thing. The Zoladz come into this town, they bought -- it's just like a county auction you buy whatever you want to buy.

They come in here, they got the road project going, they're using it as their own personal storage, the City of Olean is in big trouble because they'll -- I don't know what the program is, they come here and use it for their storage, the road project that's going on in Olean is probably over budgeted by my guess would be about one million dollars. And then that place will sit vacant until there is an environmental study done, they probably don't have to put a dime into it, I just can't believe it. You know, you want a water sample, you come to my house at 1312 Seneca Avenue, I have an underground spring that runs 24 hours a day, I pump it into the city water and that brings goldfish in there. And I think I'm going to put a goldfish in there and see if it will live.

And I also have a hand drilled well that has been used since 1957, you can take a water sample out of that. And I'm trying to buy the property, dumb me.

MR. THANTU: You did ask two pretty loaded questions.

JOSEPH GIARDINI: Yes, I did.

MR. THANTU: If I may mention that to you. The first question I think you're focusing on protection of wildlife and so your question has to do with any environmental or ecological risk assessment that EPA has done for the Olean Well Field Superfund Site, but what I can tell you is -- I can tell you the ecological risk assessment that has been done on the AVX property, but that's limited to the 18.5 acre AVX property. As I showed you one of the figures earlier of the 18.5 acre property outside that chain link fence it's all wetlands and wooded area.

We did conduct a qualitative risk assessment including three sediment samples that we collected back in the -- for the 1996

record of decision. And those results came back non-detect for volatile organic compounds, which are the chemicals of interest for AVX property. So we concluded based on that qualitative ecological risk assessment that wildlife is not at risk, at least AVX property, but outside that I cannot really answer that question, I think that's where your question was going to. So I think I would need more information on that, you know?

And second question I think you were talking a lot about Loohn's Dry Cleaning facility that's where EPA did a major excavation work, oh my God, like 40 -, 50,000 maybe cubic yards, it's a lot more than what AVX did.

JOSEPH GIARDINI: That's what I'm saying is my family has been in the gravel business all of our life, we know what tonnages --

MR. THANTU: Right, I can see that.

JOSEPH GIARDINI: And all of the sudden you're telling me because they took out -- if they took out 250 loads, you'd have to have

250 loads of gravel brought back in.

MR. THANTU: If I may say, sir, those two are totally isolated from each other, AVX and Loohn's Dry Cleaning we had full access to do whatever we had to do.

JOSEPH GIARDINI: I'm just questioning --

MR. THANTU: I want to make sure I answer your question, that's all.

JOSEPH GIARDINI: You know, 500 trucks driving by the house, I would definitely notice.

MR. THANTU: I'm with you.

JOSEPH GIARDINI: The only major project that I've seen was when they stripped the parking lot down for -- that was the only time that there was any -- you know, the whole new parking lot that they put in.

MS. KIVOWITZ: At AVX.

JOSEPH GIARDINI: I'm just, I was worried.

MR. BASILE: Are there any other questions? Yes, sir.

G A R Y S W A I N

GARY SWAIN: Gary Swain, S-W-A-I-N, another resident of Olean, Town of Machias, Cattaraugus County resident, I'm a business rep for the International Union Property Engineers, Local 17. My question to you would be this superfund site, would this be federal days, days at work? That would be one question. The other question I would have for you is I guess this time according to what you said you're not going to do any soil remediation at this point in time, is that something in the future that may happen and if so, you know, were they thinking of putting any type of shoring system in next to the building so that they can remove more soil? Or is it to the point where you get the railway to clean it up and you just take the building down and remove all the soil and maybe possibly burn it on site or something?

MR. THANTU: That would really be the only way, the latter part of your question,

when we looked at all these different alternatives in the feasibility study, we looked at all the technology including directional drilling of the two other soil alternatives I went over in-situ thermal remediation and multi-phase extraction. And we did a very thorough evaluation and we determined that even with a directional drilling technology, we would not be able to access all the subsurface area beneath the heart of that southeastern portion of that manufacturing building, it would have a tremendous impact on the semiconductor operations.

And as I said earlier, semiconductor company, you know, the kind of work that they do 24/7, it's very, very sensitive to like vibration and especially these electrodes that we would be putting in horizontally, they would wreak havoc, you know, on the day-to-day operations. So at the end of it all we made the determination that we won't be able to fully access much of that soil contamination,

which is beneath that southeastern portion of the building unless that part of the building, you know, comes down or no operation is taking down. Even then vibration can travel to other parts of the building --

MS. KIVOWITZ: That said, it's an interim remedy, but we believe that with the combination of the hydraulic trench and the pumping at the levels that we're requiring of the production well, we will contain that contamination on the site, on the AVX property so that it won't continue to impact the city aquifer or move off property. That's the goal of this interim remedy.

MR. THANTU: Much of the groundwater contamination is in that upper till unit aquifer. And we do have some low detections of contaminants in the city aquifer, but they're about four orders of magnitude less than what we are seeing in the upper till aquifer. So the city aquifer alternatives would fully contain the low detections in the city aquifer beneath the building from

migrating to the off-site area. And then the highly contaminated chemicals in the shallow till unit aquifer would be all treated when they come into contact with the hydraulic trench 200 feet in length that would be more or less perpendicular to the Conrail railroad tracks.

So as Sharon said, overall approach we would be able to fully contain both soil contamination in terms of human exposure through dermal contact and groundwater contamination which would otherwise migrate to off-site areas. And we're going to keep that in place until sometime in the future when we could fully access the building. For example, if there should be like change of use of the building, then we would come back to revisit.

MR. BASILE: Any other questions?

R O B L A F O R G E

618 Grandview Avenue, Olean, New York 14760

ROB LAFORGE: Rob Laforge,

L-A-F-O-R-G-E, I reside at 618 Grandview Avenue in the city. I'm with the New York State Foundation For Fair Contracting, FFC. My question is this, I think it was '85 when they put the strippers across the river where the water flows directionally following all the engineering (inaudible). They did not move the wells since then, they did not put in new wells so they didn't have to mess with that anymore. As far as the city goes I thought the plan was to put in some wells further away because obviously it's underneath the river and the aquifer is lower (inaudible) The strippers will take out the three carcinogens or whatever you talked about, that's the purpose of that is to strip it and get it out of the water at the intake?

MR. THANTU: Yeah, the air stripper on all three supply wells.

ROB LAFORGE: Okay because I thought a couple years ago I think in the '90s they went and put a new water tank on the top of the hill, I thought they were going to address

that, the well situation at the same time, I'm not sure. You don't have any idea?

MR. THANTU: I'm not aware of it, but I'll certainly look into it.

ROB LAFORGE: Thank you.

MR. BASILE: Eric?

MR. WOHLERS: I can answer that question. The Health Department oversees the drinking water program for New York State and yes, the city built the new storage tanks, they also built the new filtration plan, but there were never any plans to drill new wells. The air strippers, the water coming out of those wells is tested on a regular basis and the air strippers are effective at removing the levels of TCE that is in the ground.

MR. THANTU: I think it's been the same three wells, supply wells 18, 37 and 38M since 1985.

MR. WOHLERS: Those wells are still an active service.

MR. BASILE: Does anyone else have a question? Are there any other questions in

the audience?

N E D D E G R O F F

NED DEGROFF: Ned Degroff, N-E-D, D-E-G-R-O-F-F, you said you removed so many tons of material from behind the plant?

MR. THANTU: The AVX? The AVX property?

NED DEGROFF: Yes.

MR. THANTU: Yes, 5,055 tons to be exact.

NED DEGROFF: Were they removed by truck?

MR. THANTU: It was in 2000, a few truck loads.

NED DEGROFF: I live next to the plant I walk my dog by there every night and I never saw a truck, I've been there 25 years.

MR. MOORE: I can vouch --

NED DEGROFF: I never saw a truck or heard one.

MR. MOORE: I can vouch for that, that excavation I was there present, at that

excavation and it was entirely excavated from the back of the plant -- you see where the shadow line is there to the lower right-hand corner? That shadow line there, that's the excavation limit and they dug all out of there to 10 feet down in the ground and --

UNIDENTIFIED SPEAKER: How far?

MR. MOORE: 10 feet.

UNIDENTIFIED SPEAKER: In 19 -- as I said in 1981 through 1984 when I was there, they were putting it in a tank underneath the ground, the tank wasn't 10 feet under the ground.

UNIDENTIFIED SPEAKER: The actual tank I know what you're talking about --

MR. THANTU: Storage tank.

UNIDENTIFIED SPEAKER: That is a storage tank, that tank up in the corner right there where Lorenzo is pointing -- up a little further, and that's where Lorenzo is talking about. That is underneath the building right now and because of the operation there it's impossible to get to that tank. Everybody

would like to do it, but --

RICHARD WEBER: It should have never been put there in the first place. Now it's contaminated the entire -- if you're going to dig 10 feet down, tell me you're going to clear the land. Hail Mary we're all going to die. TCE has got to be rapid in the entire Eastern Olean area, there's no doubt about it. Nobody's took any course samples outside the box, inside that fence, shit, that ain't going to do it. It's got to come outside the fence, come outside the fence and tell me whether this land who's only a short distance from the plant, he's got a well in his property, it's never been tested.

ERIC WOHLERS: Maurice, it might help if you explain which direction groundwater flows. Your property is to the west of the parking lot and his property is to the east of the building? So you're up on Seneca.

UNIDENTIFIED SPEAKER: I'm lower Seneca.

MR. THANTU: Where is your house, sir?

UNIDENTIFIED SPEAKER: Going down Seneca

Avenue, Seneca Avenue to Clark.

MR. THANTU: Well, I can tell you groundwater directions. In the city aquifer you know the supply wells are on the other side of the Allegheny River because of all the pumping that combines the 3 million gallons a day, that twist the direction of groundwater from the city aquifer. In the city aquifer groundwater flow is pretty much from west to east. Down in the shallow aquifer it pretty much runs from northwesterly to southwesterly in the shallow aquifer, that's the direction.

UNIDENTIFIED SPEAKER: It was going west to east, now it's going --

MR. THANTU: In the city aquifer, deep aquifer where you get your safe water from, that's going from west to east.

UNIDENTIFIED SPEAKER: I think east to west.

MR. THANTU: I'm sorry, east to west, east to west.

UNIDENTIFIED SPEAKER: Water in the valley generally comes the direction of the

river.

RICHARD WEBER: So it's coming our way?

UNIDENTIFIED SPEAKER: And towards you, yes.

RICHARD WEBER: And then they had another company that was up the block that did the same thing, Cooper, they buried it, too, so that's eastern coming western.

UNIDENTIFIED SPEAKER: That's why when they first labeled it as a superfund site, they knew that there were four companies, four sources.

RICHARD WEBER: I understand that. How far did they date outside the box, we're talking in Myrtle Beach the guy had 735 acres that was contaminated across the street. Tell me how big that is? I can -- that's documentation you can read, Google it, 55-page documentation by Sun Times and they tell exactly what AVX did.

UNIDENTIFIED SPEAKER: It migrates off site underground and that's why they put in the public water line to get everybody off

groundwater so you're not drinking it.

UNIDENTIFIED SPEAKER: But he's not, he's outside the city limits.

UNIDENTIFIED SPEAKER: And there have been studies to test other people's wells.

RICHARD WEBER: How about his?

UNIDENTIFIED SPEAKER: We'll have to get his address and check the records to see how long have you lived there.

MR. THANTU: Right.

RICHARD WEBER: A little late.

K A T H Y W E S L E Y,

1306 Seneca Avenue, Olean, New York 14760

KATHY WESLEY: I'm Kathy Wesley and I live at 1306. Now I'm four houses down, I'm next door to Joe, now in the -- you said that there's a lead coming down the railroad track, the railroad track is right there by the end of our property. It's coming right down, there's a ditch coming down, now there is -- is the -- there's like a big -- there's swamp

land, you know, whatever, all of the sudden Joe mentioned no wildlife. We had tons of wildlife, we have nothing now. No deer, nothing that walks on the ground back there.

Now, we have a dog that when he goes down over the bank off to this pond, he would come back -- before he'd come back and we could wash him off and it wasn't so bad. Now he turns -- it's like a gray like this, it stinks, it's oily and we have to hose him off before I can get him in the house to give him a bath.

MS. KIVOWITZ: Where do you live?

KATHY WESLEY: I'm four houses down from the end of the AVX parking lot.

UNIDENTIFIED SPEAKER: The west side, that side right there, four houses the other way.

MS. KIVOWITZ: On which side of the railroad track? On the same side of the railroad track as AVX?

MR. THANTU: Yeah, right here.

MS. KIVOWITZ: And those wetlands you're

talking about behind your house are to the west?

KATHY WESLEY: The railroad tracks, the ditch and then the wetlands.

UNIDENTIFIED SPEAKER: Right where you got that dot. No where you had the dot the first time right there by the track. Go the other way.

MR. THANTU: Right here?

UNIDENTIFIED SPEAKER: No, go the other way. You're going towards our property.

KATHY WESLEY: And so my question is do wildlife sense that there's something back there? Because when we first moved over there we had tons of deer, tons of them. Babies would be born back there, everything, and the last couple three years we don't have anything now. If we do they stay to the front of our house and they bed down in the pine trees across the street, but before they were out back and they --

MR. THANTU: Can I ask how long ago that was?

KATHY WESLEY: How long ago what was?

JOSEPH GIARDINI: The last three or four years.

KATHY WESLEY: Actually the last three or four years it thinned right out and now we have absolutely nothing, so I'd say probably two or three years.

MR. THANTU: So quite recent?

KATHY WESLEY: Yeah, I guess, but we have no nothing back there. I mean, a few so there's -- whatever is in those wetlands or whatever maybe it's something that needs to be checked out.

MR. THANTU: Can I just put the other figure on that shows the four source areas? So I've got an understanding in relation to where the four source areas are, so you live over here someplace? Here is the Conrail railroad tracks.

KATHY WESLEY: There's the railroad tracks, where's the end of the parking lot for AVX?

MR. THANTU: There's AVX.

KATHY WESLEY: One, two, Joseph the third house and we're the fourth house.

JOSEPH GIARDINI: Where the dark green is Seneca, back of the railroad tracks that's where Rick is at and they're in between.

MR. THANTU: It's kind of interesting because you have a quite far move from all the four source areas, I thought you may be closer to Alcas, but not at all. That's within 1.5 square miles of the Olean Well Field Site. Most of my investigations took place at the facility of these four source areas.

MS. KIVOWITZ: In -- when we did the original OU2 RI/FS we did look at 13 other properties and these were the four that were found contamination on and there are a bunch of them, I can't really tell you right now, that was back in 1996, I guess. And we did look at a bunch of other properties and determine that these were the four that were contributing to the contamination.

I don't know where those other properties are, but if you go online you can find that

the OU2 ROD, so what we're doing now is we're amending the OU2 ROD to the AVX facility. Last year we amended the OU2 ROD for the Alcas facility, Cutco facility and added an OU3 component, which is a property just adjacent to the Alcas property, but in 1996 -- '6 was it 1996?

MR. THANTU: Yeah.

MS. KIVOWITZ: We issued the OU2 ROD and if you look that up on EPA's web site it will list all the other properties that we looked at and what was found there. And I don't know where those properties are, I can't tell you offhand where those properties are, maybe they're -- you know, and if there's something you can contact us or contact the Health Department if you're concerned about an odor or a substance that your dog is coming back with, you may be able to contact the Health Department about that, but I'm sorry I just don't know the locations of all those other properties offhand.

MR. BASILE: The gentleman with the

well, when was the last time your well was sampled, sir?

UNIDENTIFIED SPEAKER: Never was, it was put in a couple years ago.

MS. KIVOWITZ: It wasn't sampled when it was first put in?

UNIDENTIFIED SPEAKER: No.

JOSEPH GIARDINI: The Health Department doesn't test for any kind of -- the Health Department if you have a well tested and if you think there's something wrong with it, where do you send the water sample out to if it's contaminated? Do they test for carcinogens? Is it just safe drinking water?

ERIC WOHLERS: Normally it test for bacteria. If there's a reason --

JOSEPH GIARDINI: So it could go undetected if there was a TC whatever?

ERIC WOHLERS: That's not naturally occurring, so you would have to be next to a contaminated site to request that type of test.

JOSEPH GIARDINI: Right.

ERIC WOHLERS: There are private labs that will do it, you can send it to yourself, there's several in the Buffalo area.

UNIDENTIFIED SPEAKER: Is it safe to water your garden with?

ERIC WOHLERS: Again, you'd want to test it. If you're very close to a known plume area, we have the ability to contact the state lab and request certain samples be taken and they would send us the bottles, we can sample them. So we have to consider on a case by case basis where your well is located.

JOSEPH GIARDINI: So basically you'd have to -- if you're close to the water sample you have to tell what you think might be in it so they can test for it?

MR. WOHLERS: Correct, because there's literally hundreds of chemicals.

MR. BASILE: We do have your names and addresses and if we're going to take anything off the site Lorenzo, Sharon, at least we know how to contact these individuals in the event that you're looking to do anything off site.

Does anybody have any further questions? Just remember that our public comment period for this proposal ends on July 15th. If you think of something after this evening's meeting that's not in the public record, feel free to e-mail or send a hard copy to Lorenzo. On behalf of EPA and the state, I'd like to thank you for attending and I'm sure we will remain in this room for a while if anyone has any further questions.

MS. KIVOWITZ: I just want to say one thing about the comments that when we write the record of decision, attached to that record of decision is a response summary where we highlight all the comments that are received, including those that are here tonight and we will attach the transcript as well and we will respond officially to all those comments. So you will see a response, a formal response to your comments if you read to the back pages of the ROD.

MR. BASILE: Thank you.

(Meeting concluded at 8:09 p.m.)

CERTIFICATION

I, Angelle Phillips, Court Reporter and Notary Public, in and for the State of New York, do hereby certify that I attended the foregoing meeting, took stenographic notes of the same, that the foregoing, consisting of 56 pages, is a true and correct copy of same and the whole thereof.

Dated: June 23, 2015

Angelle C. Phillips

Angelle Phillips, Court Reporter

Appendix V – Attachment 5

Written Comments Submitted During Public Comment Period

ARCADIS
Infrastructure · Water · Environment · Buildings

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Mr. Lorenzo Thantu
United States Environmental Protection Agency, Region 2
New York/Caribbean Superfund Branch
Emergency and Remedial Response Division
290 Broadway, 20th Floor
New York, New York 10007-1866

Subject:
Comments to the USEPA's Proposed Plan
AVX Corporation Site Remediation Project
Olean, New York

Date:
July 14, 2015

Contact:
Mark B. Hanish

Phone:
724.934.9518

Email:
mark.hanish@arcadis-us.com

Our ref:
B0007385.0001

Dear Mr. Thantu:

On behalf of AVX Corporation (AVX), ARCADIS respectfully submits the following comment to the United States Environmental Protection Agency's (USEPA's) June 2015 Proposed Plan for the AVX site located at 1695 Seneca Avenue in Olean, New York. This comment is provided within the comment period stated in the Proposed Plan, which extends through July 15, 2015.

Comment 1 – Clarification to the USEPA's Risk Summary

The USEPA has provided a Risk Summary specific to Operable Unit 2 (OU-2) starting on Page 7 of the Proposed Plan, and multiple times within that summary has indicated that:

1. USEPA "…has determined that the results of the OU-2 ROD risk assessment for the AVX Property have not substantially changed…"

2. The estimated potential levels of exposure to constituents of concern (COCs) in soil and groundwater are above acceptable health-based levels within OU-2.

Both statements are misleading and should be clarified. AVX's clarifications are provided under the two subheadings below.

Conditions Subsequent to the OU-2 ROD Risk Assessment Have Changed

The USEPA states that "[t]he baseline risk assessment estimated the human health and ecological risk which could result from the contamination at the Site *if no remedial actions were taken*. Based on the data collected to date, the results of the

baseline risk assessment contained in the OU-2 ROD have not substantially changed." [Page 7, emphasis added.]

With respect to the AVX Property or "Source Area", USEPA's reliance on the Risk Assessment prepared prior to the September 1996 ROD for these statements, without further clarification, implies that nothing has been done to remediate the AVX Source Area of OU-2 since that time. To the contrary, the removal of 5,055 tons of soil in 2000 to a depth of 10 feet below ground surface in the area that the OU-2 ROD identified as the primary source area within the AVX Source Area is a material change in circumstance. Furthermore, the facility has extracted groundwater essentially continuously from the City Aquifer with its onsite production well (PW-1) for a period of 56 years, including almost 20 years since issuance of the ROD. This additional nearly 20 years of pumping of groundwater by AVX production well PW-1 has removed a mass of COCs that would logically lead to the reduction in COC mass and ultimately in reduction in potential risk. The soil removal and continued pumping have only served to further reduce risk within the AVX Source Area if any unacceptable risk was ever present. The Final Proposed Plan should clearly acknowledge these two beneficial developments under the remedy already completed within the AVX Source Area and Property.

The AVX Source Area is Isolated from the OU-2 Other Source Areas and from the Larger Olean Well Field Site and Risks Related to the AVX Source Area Differ from Risks within Other Source Areas within OU-2

Although it may be true that non-AVX source areas within OU-2 contain concentrations of COCs in soil and groundwater above risk-based concentrations or may continue to leach COCs to the City Aquifer within the area of capture influence of the City of Olean's water supply wells, such broad conclusions cannot be applied to the AVX Source Area.

Therefore, the final Proposed Plan should acknowledge the following:

- Although the City Aquifer is used as a source of water supply for the City of Olean, the COCs within the City Aquifer beneath the AVX Property have been and are currently being contained by pumping of groundwater from AVX pumping well PW-1, which has been operating since the 1950s. Therefore, although it is understood that concentrations of some COCs in the City Aquifer beneath the AVX Property are above regulatory action levels, the risks stated by the USEPA in the Proposed Plan, specific to the broader OU-2, overstate both past and current risks within the boundaries of the AVX Source Area and AVX Property.

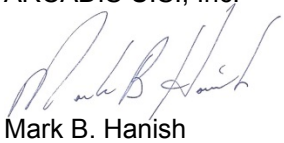
- By extension, it is highly unlikely that groundwater within the City Aquifer in other areas of the Olean Well Field Site that are subject to current or future withdrawal and use by the City or others contain COCs that originated from within the boundaries of the AVX Source Area or Property. This is because AVX has been capturing groundwater and COCs, contained within that City Aquifer groundwater, within its property boundaries by continuous and long-term pumping of production well PW-1.

- By further extension, COCs in soil within the AVX Source Area and Property are largely capped by asphalt or buildings that limit the potential for leaching of COCs to groundwater. Any COCs that have or may continue to leach to groundwater beneath the AVX Source Area or Property are contained by the continuous pumping of production well PW-1. Therefore, any broader statements that the USEPA makes regarding unacceptable risks related to COCs in soil within OU-2 do not directly apply to any source on the AVX Property.

Please contact me at 724.934.9518 if you or the USEPA team has any questions or comments about this comment letter.

Sincerely,

ARCADIS U.S., Inc.



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