DRAFT
OPTIMIZATION PLAN FOR SOIL VAPOR INTRUSION AT SD052-01 APRON 2 CHLORINATED PLUME SITE (BUILDINGS 785 AND 786) AND SD052-02 BUILDING 775 SITE (BUILDINGS 774 AND 776) FORMER GRIFFISS AIR FORCE BASE ROME, NEW YORK

December 2016

Prepared For:

Air Force Civil Engineer Center
Building 171
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Contract No: FA8903-16-F-0012

Prepared By:

1608 13th Avenue South, Suite 300
Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com

This page intentionally left blank

TABLE OF CONTENTS

Tables

Table 1 is provided within the text of the document.

Figures

Appendix

ACRONYMS AND ABBREVIATIONS

§	Section
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFRL	Air Force Research Laboratory
AFRPA	Air Force Real Property Agency
AOC	Area of Concern
ARAR	Applicable or relevant and appropriate requirements
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
BRAC	Base Realignment and Closure Act
CAPE	CAPE Environmental
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of concern
DCE	Dichloroethene
EEEPC	Ecology and Environment Engineering, P.C
FFA	Federal Facilities Agreement
FPM	FPM Remediations, Inc.
FS	Feasibility Study
ft	Feet
ft^2	Square feet
GAC	Granular activated carbon
IC	Institutional Control
IRA	Interim Response Action
J	Laboratory flag indicating an estimated concentration
LCC	Life cycle cost
LTM	Long-Term Monitoring
LUC	Land-Use Control
µg/L	Micrograms per liter
$µg/m^3$	Micrograms per cubic meter
NCP	National Contingency Plan
NFA	No further action

NPL	National Priorities List
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and maintenance
OES	Optimized Exit Strategy
OP	Optimization Plan
OU q=	Operable Unit
PCE	Tetrachloroethene
POP	Period of performance
ppb	Parts per billion
QAPP	Quality Assurance Project Plan
RAO	Remedial action objective
RI	Remedial Investigation
ROD	Record of Decision
ROI	Radius of influence
RRS	Rome Research Site
RSL	Regional Screening Level
SAC	Strategic Air Command
SC	Site closure
scfm	Standard cubic feet per minute
SI	Supplemental Investigation
SSVM	Sub-slab vapor mitigation
SVE	Soil vapor extraction
SVI	Soil Vapor Intrusion
TCA	Trichloroethane
TCE	Trichloroethene
UFP	Uniform Federal Policy
U.S.	United States
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
VC	Vinyl chloride
VMP	Vapor monitoring points

VOC	Volatile Organic Compound
w.g.	Water gauge

This page intentionally left blank.

1 INTRODUCTION

Bhate Environmental Associates, Inc. (Bhate), has been contracted by the Air Force Civil Engineer Center (AFCEC), to implement an Optimized Exit Strategy (OES) on sub-slab vapor mitigation (SSVM) systems associated with soil vapor intrusion (SVI) at Sites SD052-01 Apron 2 Chlorinated Plume Site [Buildings 785 and 786] and SD052-02 Building 775 Site [Buildings 774 and 776] at the former Griffiss Air Force Base (AFB) in Rome, New York. The OES at the sites will be conducted under contract number FA8903-16-F-0012. Figure 1 depicts the SSVM site locations of Buildings 774, 776, 785, and 786.

Work conducted at these sites will be performed in accordance with the *Final Record of Decision* [ROD] *Soil Vapor Intrusion at SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) Former Griffiss Air Force Base, Rome, New York,* (United States Air Force [USAF], September 2016) and the *Final 2016 Update Uniform Federal Policy* [UFP] - *Quality Assurance Project Plan* [QAPP] *for Long Term Management Former Griffiss Air Force Base Rome, New York* (Bhate, November 2016a). **Section 2** of this Optimization Plan (OP) provides a site description, the historical and current activities, and outcome for the SVI at Site SD052-01 and SD052-02, which are combined into a site called SD052-SVI. The work plans/optimization documents for SD052-SVI will be provided separately from this OP.

1.1 Griffiss AFB Operational History

The mission of the former Griffiss AFB varied over the years. The base was activated on February 1, 1942, as Rome Air Depot, with the mission of storage, maintenance, and shipment of material for the United States (U.S.) Army Air Corps. Upon creation of the Air Force in 1947, the depot was renamed Griffiss AFB. The base became an electronics center in 1950, with the transfer of Watson Laboratory Complex (later Rome Air Development Center [1951], Air Force Research Laboratory/Rome Research Site [AFRL/RRS]), and then the Information Directorate at RRS was established with the mission of applied research, development, and testing of electronic air-ground systems. The headquarters of the Ground Electronics Engineering Installations Agency was established in June 1958 to engineer and install ground communication equipment throughout the world. The 49th Fighter Interceptor Squadron served at Griffiss AFB from 1959 until its inactivation in 1987. On July 1, 1970, the 416th Bombardment Wing of the Strategic Air Command (SAC) was activated with the mission of maintenance and implementation of both effective air refueling operations and long-range bombardment capability. Griffiss AFB was designated for realignment under the Base Realignment and Closure Act (BRAC) in 1993 and 1995, resulting in deactivation of the 416th Bombardment Wing in September 1995.

1.2 Environmental Background

As a result of the various national defense missions carried out at the former Griffiss AFB since 1942, hazardous and toxic substances were used, and hazardous wastes were generated, stored,

or disposed of at various sites on the installation. The defense missions involved were, among others: the procurement, storage, maintenance, and shipment of war material; research and development; and aircraft operations and maintenance.

Pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Griffiss AFB was included on the National Priorities List (NPL) on July 15, 1987. On August 21, 1990, the U.S. Air Force (USAF), the U.S. Environmental Protection Agency (USEPA), and New York State Department of Environmental Conservation (NYSDEC) entered into a Federal Facilities Agreement (FFA) under Section 120 of CERCLA. On March 20, 2009, 2,897.2 of the 3,552 acres were deleted from the NPL.

This OP for SVI mitigation is based on the Final ROD (September 2016), 2016 Final Proposed Plan (AFCEC, August 2016); results from the Feasibility Study (FS) conducted in 2008 for SVI at Buildings 774, 776, 785, and 786 (FPM Group Ltd, February 2010); and evaluation of the ongoing interim response action (IRA). During the FS, soil vapor analytical results were compared to the Air Force Industrial/Commercial SVI Screening Levels. The SVI risk-based screening values were calculated using conservative exposure assumptions for human health to indoor air and soil vapor under an industrial/commercial scenario. As a result, an IRA utilizing a horizontal sub-slab depressurization approach, was implemented by the USAF. The purpose of the IRA was to evaluate the effectiveness of horizontal sub-slab depressurization. Under the IRA and future remedial actions, protectiveness of the remedy was evaluated using applicable New York State Department of Health (NYSDOH) criteria, pertinent USEPA Regional Screening Levels (RSLs), or a site-specific human health risk assessment prepared in accordance with USEPA guidelines.

In August 2016, the USAF issued the Final Proposal Plan. The Proposed Plan was prepared in accordance with public participation requirements of the CERCLA, as amended; the National Contingency Plan (NCP); and the former Griffiss AFB FFA. The Proposed Plan was intended to elicit public comments on the proposal for SVI mitigation by continuing operations of the horizontal sub-slab depressurization system at the sites. Such public participation in the remedial selection process is required by CERCLA Section (§) 117(a) and the NCP (40 Code of Federal Regulations [CFR] §300.430(f)(3)). On September 30, 2016, the Final ROD was issued and the selected remedy was SVI mitigation by horizontal sub-slab depressurization at SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776) to address the vapor intrusion potential associated with the contaminated groundwater.

1.3 Standards Criteria and Guidance and Remedial Action Objectives

The contaminant of concern (COCs) associated with SD052-SVI is trichloroethylene (TCE). Groundwater samples (under separate efforts) will be collected and analyzed via USEPA Method 8260B, in accordance with the 2016 Update to the UFP-QAPP for the Former Griffiss AFB (Bhate, September 2016). The groundwater results will be compared to the NYSDEC Class GA Standards and Guidance Values included in *NYSDEC Technical and Operational Guidance Series 1.1.1*

(NYSDEC, 1998). Sub-slab, indoor, outdoor ambient air, and influent samples will be collected and analyzed via Method TO-15 USEPA Method 8260B, in accordance with the 2016 Update to the UFP-QAPP for the Former Griffiss AFB (Bhate, September 2016), and the results will be compared to NYSDOH screening criteria (October 2006 or updated criteria) found at http://www.health.ny.gov/environmental/investigations/soil_gas/svi_guidance/docs/svig_final 2006_complete.pdf and/or USEPA industrial use RSLs (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016). In August 2015, NYSDOH lowered their guideline for TCE in ambient air from 5 micrograms per cubic meter ($\mu g/m^3$) to 2 $\mu g/m^3$ and developed a recommended immediate action level of 20 $\mu g/m^3$.

Site closure (SC) is not possible at this time, due to continued groundwater contamination greater than groundwater applicable or relevant and appropriate requirements (ARARs) (New York State Ambient Water Quality Standards and Guidance Values, NYSDEC, June 1998) at SD052-01 and SD052-02. The overall remedial action objective (RAO) for SD052-SVI is to prevent individual human exposure to soil gas vapor by continued reduction of COCs at the site and to allow for SC by 2025.

The established RAO is to prevent individual human exposure to soil gas vapor levels within buildings at unacceptable levels represented by an excess cancer risk greater than 1×10^{-6} and also represented by a potential non-cancer risk for a hazard index greater than one. Current USEPA RSLs represent the RAOs for evaluating the protectiveness of the IRA. It should be noted that the RSLs are Preliminary Remediation Goals since RSLs are not cleanup levels. This OP details the future exit strategy decisions which will rely on applicable NYSDOH criteria, pertinent USEPA RSLs, or a site-specific human health risk assessment prepared in accordance with USEPA guidelines.

The purpose of this OP is to identify the approach for evaluating and optimizing the effectiveness of the remedial activities occurring at SD052- 01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776) and to present performance metrics and models to be used for describing how remediation is expected to progress.

Section 2.5 presents the applicable regulatory drivers and Section 2.6 of this OP describes the ROD requirements for meeting the RAOs. The OP outlined herein is in the best interest of the USAF because optimization of the ROD remedies provides the USAF with the lowest life cycle costs (LCCs) and liabilities, while ensuring compliance with the RAOs and protectiveness of human and ecological receptors.

This page intentionally left blank.

2 SOIL VAPOR INTRUSION AT SD052-01 AND SD052-02

2.1 Site Description

2.1.1 SD052-01, Apron 2 Chlorinated Plume Site (Buildings 785 and 786)

Buildings 785 and 786 are located on the southwestern corner of Apron 2 between Aprons 1 and 2 (**Figure 2**). The SVI potential at these buildings is a result of contaminated groundwater associated with the Apron 2 Chlorinated Plume Site (SD052-01). Each building is 28,251 square feet (ft^2) and is currently an unoccupied airplane hangar. The buildings are largely open with several first and second floor offices on the buildings' interior perimeters. Buildings 785 and 786 were built in 1959 on a 13.5 to 14-inch thick, unsealed concrete slab. These buildings served as aircraft maintenance facilities (nose docks) and were taken out of service in 1995 after the Griffiss AFB was realigned.

Building 786 was occupied for a few years by a pallet refurbishing company until 2002. From 2002 to 2013, the buildings were used for equipment storage. During that time, all heating and air handling equipment were in a state of disrepair and assumed inoperable. In addition, the buildings were poorly sealed due to broken windows, open hangar doors, and missing exterior sheet metal. Buildings 785 and 786 were renovated in the summer of 2013 and included repairs to the hangar doors, exterior sheet metal, and windows, repairs to electrical and heating systems, interior and exterior painting, and removal of first and second floor offices. Currently, both buildings are being used as aircraft hangars.

2.1.2 Buildings 774 and 776

These two buildings are located between Phoenix Drive and Patrol Road at the former Griffiss AFB in Rome, New York (**Figure 3**). The SVI potential at these buildings is a result of contaminated groundwater associated with the SD052-02 Building 775 Site. Building 774 is a one-story office building, approximately 18,990 ft^2 in size, and is currently occupied by a computer/security firm. The building is occupied on work days from 8 AM to 5 PM by approximately 45 people. Building 774 was built in 1959, but underwent major renovations in 2000. New windows and doors were installed along with 36 new air handlers including new air ducts in ceilings and new cooling towers. The building's foundation is an 8-inch thick concrete slab with no basement. The floors are mostly carpeted except for the bathrooms, janitor's closet, and boiler room where floor drains exist.

Building 776 is a one-story office building and is approximately 27,410 ft^2. The building is currently occupied by a software development firm. The building is occupied on work days from 7 AM to 6 PM by approximately 80 people. Building 776 was built in 1959, but underwent major renovations in 2002. New windows, which do not open, and doors were installed, the interior was refinished and most floors were covered with new carpeting. Heat and outdoor air are

provided through 43 heat pumps. The building was constructed on a 3.5 to 6-inch thick concrete slab, with no basement. Several floor drains exist in bathrooms and one crack was observed in the concrete floor near the southeastern entrance door.

2.2 Geology and Hydrogeology

2.2.1 Buildings 785 and 786

The immediate area surrounding Buildings 785 and 786 is relatively flat, mostly covered with reinforced concrete, and has little or no elevation difference. The groundwater flow direction is in the northeasterly direction towards Six Mile Creek.

The aquifer is comprised of silty sands with an average thickness extending from 60 feet (ft) below ground surface (bgs) to 120 ft bgs. Due to a relatively flat gradient, average groundwater velocities at this site are slow and have been estimated at approximately 10 ft per year. Higher velocities may exist in discontinuous seams of coarse sand and gravel. Contamination is not found in the bedrock.

2.2.2 Buildings 774 and 776

Buildings 774 and 776 are located on SAC hill which is an elevated area in the southeast section of the former Griffiss AFB, overlooking the Aprons. The immediate area around the building is flat with little or no elevation difference. The area is covered with grass, asphalt parking lots, roads, and concrete walkways. Past investigations have indicated that the groundwater flow direction is in the south-southwesterly direction towards Landfill 6 as indicated on Figure 3.

The aquifer is comprised of silty sands with an average thickness extending from 60 ft bgs to 120 ft bgs. Average groundwater velocities have been estimated at approximately 10 ft per year. Higher velocities may exist in discontinuous seams of coarse sand and gravel. Contamination is not found in the bedrock. Groundwater studies at the nearby Landfill 6 TCE Site found relatively aerobic conditions and low dissolved organic carbon concentrations. The general absence of cis-1,2-dichloroethylene (DCE) in the Building 775 plume confirms that reductive dechlorination is not occurring (Ecology and Environment Engineering, P.C. [EEEPC], February 2007).

2.3 Historical and Current Monitoring Activities

2.3.1 Groundwater Investigation/Remedy

SD052-SVI groundwater analytical results presented in Sections 2.3.1.1 and 2.3.1.2 below were obtained from the *Final Record of Decision Soil Vapor Intrusion at SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) Former Griffiss Air Force Base, Rome, New York* (AFCEC, September 2016).

2.3.1.1 SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786)

The SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) is associated with a TCE contaminated groundwater plume. A Remedial Investigation (RI) was performed in 2002 and 2003 in which two chlorinated plumes (referred to as the southern and northern plumes) were delineated at Apron 2 and the surroundings areas. The three primary contaminants present in the groundwater that exceed NYSDEC Class GA Groundwater Standards are TCE and its breakdown products cis-1,2-DCE and vinyl chloride (VC). The source of the contamination is assumed to be extended use of chlorinated solvents in the nose dock facilities (Buildings 782 through 786), with potential leaks due to floor drains, sewer lines, and oil water separators.

Several petroleum contaminated plumes originating from the Apron 2 fueling system are present and commingle with the southern chlorinated groundwater plume in the area. Significant reductive dechlorination is occurring and currently TCE exceedances are present only at the source (near Building 785). TCE is almost completely degraded to cis-1,2-DCE and VC downgradient of the source and it appears that no significant source of TCE remains at the site. Sampling data from 2014 for TCE, cis-1,2 DCE, and VC showed maximum concentrations of 11.6 micrograms per liter (µg/L), 51 µg/L, and 35.6 µg/L, respectively.

Several long-term monitoring (LTM) programs for petroleum and performance monitoring for chlorinated groundwater contamination are ongoing at Apron 2 to monitor and track contamination. The groundwater remedy for the SD052-01 (Apron 2 Chlorinated Plume Site Area of concern [AOC]) has been implemented in accordance with the On-Base Groundwater AOC ROD which was signed by the USEPA in March 2009. The selected remedy is monitored natural attenuation using the ongoing physical, chemical, and natural biological processes that reduce the contaminants within the aquifer. As documented in the Final Demonstration of Remedial Actions Operating Properly and Successfully Nosedocks/Apron 2 (EEEPC, August 2013), natural attenuation is evident at the Apron 2 Chlorinated Plume Site. Currently, 13 monitoring wells and 3 surface water sampling locations are sampled. Target Volatile Organic Compound (VOC) concentrations remain stable or are decreasing at Apron 2.

2.3.1.2 SD052-02 Building 775 Site (Buildings 774 and 776)

The SD052-02 Building 775 Site (Buildings 774 and 776) is associated with a TCE contaminated groundwater plume. The Building 775 Site plume is located downgradient and south of former maintenance facilities in Buildings 774 and 776 and former fuel pump house Building 775. Solvent use in Building 774 is thought to be a primary source of contamination. It was originally thought that Building 775 (Pumphouse 3) was the origin of a TCE plume at the Building 775 on-base groundwater site, but during the RI and Supplemental Investigation (SI), it was determined that the actual source of contamination was the degreasing room/vat in Building 774. This degreasing system used a monorail to carry equipment to the degreasing vat for solvent cleaning when the building was used as an armament and electronics shop. Solvent use was widespread in these facilities in the 1950s, 1960s, and early 1970s.

The primary contaminant exceeding New York State (NYS) Class GA Groundwater Standards is TCE with minor detections of 1,1,1-trichloroethane (TCA) and tetrachloroethene (PCE). The contaminated groundwater is assumed to be the source of the contaminated soil vapors. Groundwater sampling in September 2004 showed that monitoring well 775VMW-5, located near the corner of Building 776, was the only well near Buildings 774 and 776 that contained significant levels of TCE (99 µg/L). Most of the Building 775 plume appears to have migrated south toward Landfill 6. In the September 2004 sampling round, the maximum TCE concentration detected was 134 µg/L at well 775MW-20 (located near the leading edge of the plume adjacent to Perimeter Road). TCE was detected at 132 µg/L in well 775VMW-10, which is also located near the leading edge of the plume adjacent to Perimeter Road. The TCE exceedances at both 775MW-10 and -20 were detected in the bottom half of the sandy aquifer (screened intervals from 88 to 120 ft bgs). In November 2006, TCE exceedances were reported in eight monitoring wells 775MW-2, -5, -6, -8, -10, -20, -27, and -28, ranging from 5.76 to 82 µg/L.

The groundwater remedy for the SD052-02 (Building 775 Site AOC) has been implemented in accordance with the On-Base Groundwater AOC ROD which was signed by the USAF and USEPA in March 2009. The selected remedy is a groundwater extraction system with discharge to an off-site treatment facility. The groundwater extraction system is designed to contain the contaminated plume (> 50 µg/L) and extract the contaminants from the aquifer. Initially, one extraction well (775EW-1) was installed but deemed inappropriate for groundwater extraction. It was replaced by a replacement extraction well (775EW-1R) and an additional extraction well (775EW-3). 775EW-1 was converted to a monitoring well. 775EW-1R and 775EW-3 were connected with a force main and the extracted contaminated groundwater is discharged to the existing sanitary sewer system for treatment at the City of Rome Water Pollution Control Facility. Per the ROD, the plume outside of the extraction system influence is anticipated to attenuate naturally to achieve groundwater standards.

Upon start-up of the groundwater extraction and discharge system in December 2008, TCE decreased significantly but has remained about the same concentration since.

2.3.2 SVI Investigation

The SD052-SVI soil vapor analytical results presented in Sections 2.3.2.1 and 2.3.2.2 below were obtained from the *Final Quarterly Operations and Maintenance Report SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) Sub-Slab Vapor Mitigation Systems (2nd Quarter/Calendar Year 2016/April – June), Former Griffiss Air Force Base Rome, New York* (CAPE Environmental [CAPE]/FPM Remediations, Inc. [FPM], July 2016).

2.3.2.1 SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786)

Between October 2006 and February 2007, an initial SVI survey was performed at Buildings 785 and 786. The results of the survey indicated that the sub-slab samples showed TCE

concentrations up to 11,000 µg/m^3 at Building 785 and 81,000 µg/m^3 at Building 786. The indoor samples showed TCE concentrations up to 2.72 µg/m^3 in Building 785 and 0.43 µg/m^3 in Building 786.

Several other COCs (e.g. benzene) were reported in the sub-slab vapor and indoor air samples, but were either detected below screening levels, detected in the outdoor air sample, or not deemed to be a COC for this site. As part of the sampling procedures, site investigations and product inventories were performed. It was noted that several pallets which held drums of motor oil, paint cans, buckets, and pails were located on the southwestern side of Building 785. In Building 786, a forklift, compressed gas and propane cylinders, a container of motor oil, and a bucket of hydraulic oil were reported. A hand-held parts per billion (ppb)-RAE meter was used to measure total VOC concentrations at these locations where readings ranged from 0 to 2,800 ppb. The highest concentration was detected in Building 785 near the pallets. A follow-up SVI investigation was conducted at Buildings 785 and 786 in April 2008 to confirm the results of the 2006 SVI survey. The indoor air TCE concentrations reported for Building 785 during this sampling round were similar in magnitude as those reported in the 2006 sampling round. A low detection of TCE (0.655 µg/m^3 at 785IA-3) and several low petroleum detections were reported. Indoor air results for Building 786 were comparable to the previous results and no TCE or daughter products were detected. The indoor/outdoor sampling results for Buildings 785 and 786 are provided in the Final Quarterly Operations and Maintenance Report (2nd Quarter/Calendar Year 2016/April - June) (CAPE/FPM, July 2016).

Sub-slab vapor results for Building 785 were one to two orders of magnitude lower than the previous results. However, there was one exceedance that was reported for sampling location 785-SSV6 (2,200 µg/m^3). Sub-slab vapor results for Building 786 were lower but the same order of magnitude as the previous results. TCE concentrations ranged from 69 µg/m^3 at 786SSV-3 to 19,000 µg/m^3 at 786SSV-1 (previous concentration at 786SSV-1 was 81,000 µg/m^3). In total, four TCE exceedances were reported at sampling locations 786-SSV1, -SSV2, -SSV5, and -SSV6. The sub-slab vapor sampling results for Buildings 785 and 786 are provided in the Final Quarterly Operations and Maintenance Report (2nd Quarter/Calendar Year 2016/April - June) (CAPE/FPM, July 2016).

2.3.2.2 SD052-02 Building 775 Site (Buildings 774 and 776)

In September 2006, an SVI evaluation was conducted consisting of sub-slab vapor samples from Buildings 774 and 776. The results indicated that chloroform and TCE were present at concentrations above their respective USAF screening levels. The indoor air samples collected from both buildings indicated that these same contaminants were present but at levels below the screening values. An additional SVI survey was conducted at Buildings 774 and 776 between October 2006 and February 2007. The results indicated that the soil vapor samples showed TCE detections up to 70 µg/m^3 (775-SV-03), the sub-slab samples showed TCE concentrations up to 1,700 µg/m^3 at Building 774 and 3,000 µg/m^3 at Building 776. The indoor samples showed TCE

concentrations up to 2.4 µg/m^3 in Building 774 and 4.4 µg/m^3 in Building 776. The USAF screening level for sub-slab vapor was 409 µg/m^3 and 41 µg/m^3 in indoor air.

After the initial SVI survey, a meeting was held between the USAF, USAF Institute for Operational Health, NYSDEC, NYSDOH, and the USEPA on December 13, 2007, to discuss the SVI survey findings. During this meeting, an agreement was reached that these buildings required additional investigation to confirm the 2006 survey results. It should be noted that in the meeting it was decided that chloroform has been determined not to be a COC (FPM, April 2008). A subsequent SVI investigation was performed in April/May 2008.

The indoor air TCE concentrations reported for Building 774 during the April 2008 sampling event were two orders of magnitude higher than those reported during the 2006 sampling event. Concentrations that exceeded screening criteria ranged from 236 µg/m^3 (774IA-4) to 559 µg/m^3 (774IA-2). Further investigation revealed, that prior to this sampling event, building renovations were performed which included removal of old carpet glue using solvents. Indoor air results for Building 776 were comparable to the previous results. Indoor and outdoor air samples were recollected from Building 774 in May 2008 due to the apparently skewed results. May 2008 results indicated that indoor air TCE concentrations were comparable to the 2006 results. The indoor/outdoor sampling results for Building 774 and 776 are provided in the Final Quarterly Operations and Maintenance Report (2nd Quarter/Calendar Year 2016/April - June) (CAPE/FPM, July 2016).

The sub-slab TCE vapor results for Building 774 were within the same order of magnitude as those reported in 2006 with two exceedances of 490 µg/m^3 and 590 µg/m^3 at locations 774SSV-1 and 774SSV-2, respectively. The sub-slab vapor concentrations reported in Building 776 were lower than those reported in 2006 and did not exceed initial screening levels. The sub-slab vapor sampling results for Building 774 and 776 are provided in the Final Quarterly Operations and Maintenance Report (2nd Quarter/Calendar Year 2016/April - June) (CAPE/FPM, July 2016).

2.4 Interim Response Action

Based on the presence of elevated TCE concentrations in sub-slab vapors and on the findings of the FS, the preferred alternative was implemented as an IRA at Buildings 774, 776, 785, and 786 to assess the effectiveness of horizontal sub-slab depressurization.

2.4.1 SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786)

The SSVM horizontal sub-slab depressurization system was installed at the SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) in winter and spring 2011. The system is shown on **Figure 4**.

2.4.1.1 SSVM System Components

The Building 785 and 786 system is composed of two horizontal wells. The horizontal well for Building 786 (786SSVM-1) was constructed of a 160 ft screen at a depth of 10 ft bgs. The horizontal well for Building 785 (785SSVM-1) was constructed of a 140 ft screen at a depth of 8 ft bgs. The horizontal extraction wells (785SSVM-1 and 786SSVM-1) are connected in line with a regenerative blower, including all blower components. The blower capacity is capable of achieving a maximum flow rate of 420 standard cubic feet per minute (scfm) and a maximum vacuum of 110 inches water gauge (w.g.). The regenerative blower is connected in line with a vapor-after-treatment system comprising of two air purification canisters each containing 140 pounds of granular activated carbon (GAC). The GAC is used to remove chlorinated solvents in the vapor phase. The calculated life span of GAC is approximately 4 months based on concentrations encountered during the pilot study from October 2010 to January 2011 at Building 785 and Building 786.

2.4.1.2 Vapor Monitoring Points

The vapor monitoring points (VMPs) were strategically placed to monitor effective radius of influence (ROI) and vapor transport and mitigation. At Building 786, 786VMP-1, -2 and -3 are respectively 15 ft, 30 ft, and 45 ft off the 786SSVM-1 well axis. At Building 785, 785VMP-2, -4, and -5 are respectively 15 ft, 30 ft, and 60 ft off the well axis. The VMPs for both horizontal wells contain three intervals of depth, a shallow (2 to 2.5 ft bgs), a medium (5 to 5.5 ft bgs), and a deep (10 to 10.5 ft bgs).

2.4.1.3 Ongoing Operation and Maintenance

The Building 785 and 786 SSVM system has operated since May 2011. Operation and maintenance (O&M) includes weekly system component readings (system temperature, flow, vacuum and motor status), semi-annual VMP vacuum measurements, and GAC disposal and replacement every 4 months. Indoor and outdoor air sampling, sub-slab vapor sampling, and influent sampling are conducted semi-annually during the heating and cooling months (CAPE/FPM, January 2015). The system was shut down August 2013 and re-started September 2014 due to an electrical supply problem caused by renovations to Buildings 785 and 786. Prior to this shut down, semi-annual monitoring results from 2011 to 2014 show a decrease in TCE sub-slab vapor and indoor air concentrations. Semi-annual monitoring continued during the system shutdown to evaluate the rebound potential. No indoor air TCE concentrations were detected above the 2014 industrial USEPA RSL (3 µg/m^3) from 2011 to 2014. All sub-slab vapor, indoor air, and outdoor air sampling results are presented in Table 7 and influent air sampling results are presented in Table 8, provided in the Final Quarterly Operations and Maintenance Report (2nd Quarter/Calendar Year 2016/April - June) (CAPE/FPM, July 2016). **Figure 5** shows the slight decreasing trend for sub-slab TCE results at Buildings 785 and 786 since the start-up of the SSVM system. All indoor and outdoor air concentrations were within an acceptable range and did not pose any unacceptable risk to building occupants.

2.4.2 SD052-02 Building 775 Site (Buildings 774 and 776)

A SSVM horizontal sub-slab depressurization system was installed at the SD052-02 Building 775 Site (Buildings 774 and 776) in Spring 2011. The system is composed of four horizontal wells as shown on **Figure 6**.

2.4.2.1 SSVM System Components

The SSVM system is composed of three horizontal wells for Building 774 (774SSVM-1, -2, and - 3) and one horizontal well for Building 776 (776SSVM-1). The horizontal wells are illustrated on **Figure 6**. The depths of the horizontal wells range from 6 ft to 8 ft bgs with screen lengths ranging from 20 ft to 180 ft long. The horizontal extraction wells are connected in line with a regenerative blower capable of achieving a maximum flow rate of 600 scfm and a maximum vacuum of 106 inches of w.g. The regenerative blower is connected in line with a vapor-after-treatment system comprising of two air purification canisters each containing GAC. The GAC is used to remove chlorinated solvents in the vapor phase. The calculated life span of GAC is approximately 4 months. Note: The design extraction rate was developed from the SSVM during the pilot study. The treatment system consist of one 140-pound activated carbon drum. The lifespan of the drum is estimated to be 2,208 days based on concentrations determined during the pilot study at Building 774 and Building 776 as described in *Draft Work Plan Sub-Slab Vapor Mitigation Design* (FPM Remediation, Inc., February 2011). The 4-month carbon change out was presumably adopted for consistency with the carbon change at Building 785 and Building 786.

2.4.2.2 Vapor Monitoring Points

The sub-slab VMPs were strategically placed to monitor effective ROI and vapor transport and mitigation. In Building 774, three sub-slab VMPs were installed; 774VMP-1, -2, and -3 with one interval screened less than a foot beneath the sub-slab. Building 776 also has three sub-slab VMPs: 776VMP-1, -2, and -3. The VMPs are located from 25 ft to 45 ft off axis of the horizontal wells. All VMPs are illustrated on **Figure 6**.

2.4.2.3 Ongoing Operations and Maintenance

The Building 774 and 776 SSVM system has operated since June 2011. O&M includes weekly system component readings (system temperature, flow, vacuum, and motor status), semi-annual VMP vacuum measurements, and GAC disposal and replacement every 4 months. Indoor and outdoor air sampling, sub-slab vapor sampling, and influent sampling are conducted semi-annually during the heating and cooling months (CAPE/FPM, July 2016). Semi-annual monitoring results from 2011 to 2014 show a decrease in TCE sub-slab vapor and indoor air concentrations. TCE concentrations have decreased from 410 µg/m^3 to non-detect at 774VMP-1, 84 µg/m^3 to non-detect at 774VMP-2, 11 µg/m^3 to 9.2 µg/m^3 at 774VMP-3, 38 µg/m^3 to 0.71 J (laboratory flag indicating an estimated concentration) µg/m^3 at 776VMP-1, 3.8 µg/m^3 to 1.1 J µg/m^3 at 776VMP-2, and 10 µg/m^3 to 3.5 µg/m^3 at 776VMP-3.

In addition, no TCE was detected in indoor air samples, from 2011 through 2014, above the 2014 industrial USEPA RSL for indoor air of 3 µg/m^3. All sub-slab vapor, indoor air, and outdoor air sampling results are presented in Table 5 and influent air sampling results are presented in Table 6 in the Final Quarterly Operations and Maintenance Report (2nd Quarter/Calendar Year 2016/April - June) (CAPE/FPM, July 2016). **Figure 7** shows the decreasing trend for sub-slab TCE results at Buildings 774 and 776 since the start-up of the SSVM system. All indoor and outdoor air concentrations were within an acceptable range and did not pose any unacceptable risk to building occupants.

2.5 Regulatory Drivers

The remedy has been selected by the USAF and the USEPA with the concurrence of the NYSDEC pursuant to the FFA among the parties under Section 120 of CERCLA, dated March 29, 1990. The remedy has been selected under CERCLA, NCP, and USEPA CERCLA guidance.

SVI mitigation and restoration activities are conducted under the supervision and recommendations of the USAF, NYSDEC, NYSDOH, and USEPA. Groundwater sample results are compared to NYS Class GA Groundwater Standards and Guidance Values included in *NYSDEC Technical and Operational Guidance Series 1.1.1* (NYSDEC, June 1998). Soil gas concentrations are compared to the NYSDOH no further action screening criteria (NYSDOH, October 2006 or updated criteria) that can be found at http://www.health.ny.gov/environmental/investigations/soil_gas/svi_guidance/docs/svig_final2006_complete.pdf and/or USEPA industrial use RSLs (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016) for COCs.

The Final ROD (AFCEC, September 2016) for the SVI Operable Unit (OU) at SD-052-02 Building 775 Site (Buildings 774 and 776) and SD-052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) includes an exit strategy for determining when and how to permanently shut-down the SSVM systems, which is the basis of this Optimization Plan. The decision to permanently shut down the systems will be agreed upon by the Air Force and Regulatory agencies that includes the NYSDEC, NYSDOH and USEPA.

2.6 Proposed Outcome

The proposed outcome of this OES is to convert the SSVM system to a passive system for SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785/786), reducing AF LCCs.

2.6.1 Pathways to Achieve Proposed Outcome

Currently, the sub-slab is actively depressurized by imposing negative pressure under the slabs by mechanical (regenerative) blowers, and the extracted vapors are discharged to a vapor treatment system consisting of GAC vessels. The latest sampling results provided in Final Quarterly Operations and Maintenance Report (2nd Quarter/Calendar Year 2016/April - June)

(CAPE/FPM, July 2016) from the IRA were compared to the baseline sampling results at SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and indicate a decreasing trend in sub-slab TCE vapors. In addition, all indoor and outdoor air concentrations were below 2016 industrial USEPA RSLs and did not pose any unacceptable risk to building occupants. Influent sampling results at both sites indicated a stable or slightly decreasing trend in TCE. During SVI mitigation, the SSVM systems will continue to be checked monthly (vacuum gage readings, flow meter readings, etc.) to ensure proper operation. Sub-slab vapor, indoor air, outdoor air, and influent sampling will be collected on an annual basis to verify the effectiveness of the systems and to show that the systems are meeting their objectives. Results will be reported after each sampling event and the performance monitoring program will be reviewed for effectiveness.

The SSVM systems will be shut down when it has been determined that the SVI RAO has been achieved or that continued operation of the system is not effective or needed; i.e., contamination is no longer being removed, sub-slab soil gas concentrations have been reduced to a level that would not impact indoor air at unacceptable levels, and/or there is no remaining groundwater contamination in the vicinity of the buildings at concentrations greater than groundwater ARARs (New York State Ambient Water Quality Standards and Guidance Values, NYSDEC, June 1998) that could impact the SVI pathway into the buildings.

The proposed outcome includes a strategy for converting active SSVM systems into passive SSVM systems, which is presented in the Final ROD (AFCEC, September 2016) under Optimization Strategy. Under the passive SSVM system, the horizontal wells will be connected to vertical pipes with wind-powered exhaust turbines. The SSVM components of the active systems will remain in place once the systems are converted to passive systems. During the operation of the passive systems, the active systems will be inspected/tested on an annual basis. The following are optimization strategy provisions as detailed in the signed ROD for converting the SSVM systems into passive SVI mitigation systems:

- Groundwater Samples: The concentrations of VOCs in groundwater in the vicinity of the soil vapor extraction (SVE) systems will be evaluated to assess the SVI pathway into the buildings. Conversion of the active SSVM system to a passive SSVM system will be evaluated if the VOC concentrations do not meet groundwater ARARs (i.e., established groundwater quality standards). Therefore, conversion of the system will be evaluated using the SSVM influent and Sub-Slab Soil Vapor Rebound Sample Result indicators discussed in the next two bullets.

- SSVM Influent: As an indicator of remediation progress in the sub-slab environment, VOCs in the influent to the SSVM system prior to any carbon treatment will be sampled periodically for laboratory analysis. When influent air data reach a stable trend (i.e., they are no longer decreasing) or the laboratory results for the SSVM system influent indicate that the sub-slab soil gas concentrations are below the NYSDOH no further action screening criteria (NYSDOH, October 2006 or updated criteria, found at

http://www.health.ny.gov/environmental/investigations/soil_gas/svi_guidance/docs/svig_final2006_complete.pdf) and/or USEPA industrial use RSLs (found at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016) for contaminants of concern, the active SSVM systems will be converted into passive SSVM systems. Note: As of August 2015, NYSDOH has lowered their guideline for TCE in ambient air from 5 $\mu g/m^3$ to 2 $\mu g/m^3$ and developed a recommended immediate action level of 20 $\mu g/m^3$.

Sub-Slab Soil Vapor Rebound Sample Results: Following the conversion of the systems, periodic (annual) performance monitoring will be conducted. Per the Final ROD, if sub-slab soil gas concentrations are reported higher than the industrial use screening criteria cited for two consecutive sampling events, the active SSVM systems will be re-started (AFCEC, September 2016).

2.6.2 Land Use Controls and Deed Modifications

Land use control (LUC)/Institutional controls (ICs) in the form of soil restrictions, groundwater restrictions, and land-use restrictions to prevent residential use were implemented at the SD052-01 (Air Force Real Property Agency [AFRPA], December 2008) and the SD052-02 (AFRPA, July 2011) in the On-base Groundwater AOC Record of Decision. SVI LUC/ICs will be implemented at these sites pursuant to the remedy recommended in the ROD.

Deed restrictions related to SVI have been placed in the deed for SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776). However, to the following language provided below will also apply to these sites. The restrictions will remain within the Area Subject to ICs until the USEPA and NYSDEC approve a change:

> "With respect to the potential for risks posed via indoor air contaminated by chemicals volatilizing from below the building slab (vapor intrusion), a grantee covenant will be included in the deed of any property within the SVI restriction area that will require either of the following: (a) mitigation of any unacceptable risk as that risk is determined under CERCLA and the NCP in a circumstance with (1) any construction of new buildings (which includes any expansion of the footprint of an existing building) or (2) any change in the current use of existing buildings to a use that would increase the potential exposure of its users to vapor intrusion (e.g., "up zoning", as in changing land use from commercial to residential); or (b) an evaluation of the potential for unacceptable risk associated with vapor intrusion that must occur prior to any construction of new buildings or any up zoning in the current use of existing buildings, and if an unacceptable risk under CERCLA and the NCP associated with vapor intrusion is posed, mitigation of the vapor intrusion shall be included in the design/construction of the structure prior to occupancy or implemented prior to the change in use. Any such mitigation or evaluations will be coordinated with the USEPA and NYSDEC. This covenant will

> remain on the property until the property meets applicable criteria for acceptable risk for specified property use as such criteria and use are established in the applicable ROD, or until such time as it is agreed to by the Air Force, USEPA, and NYSDEC."

The slabs of Buildings 774, 776, 785, and 786 shall not be compromised without the prior written approval of USEPA, NYSDEC, and the USAF. Bhate will conduct annual SVI LUC/ICs inspections.

2.6.3 Metric Development: Proposed End Point, Metrics, and Approach

The proposed end point is the Optimization Strategy as per the Final ROD by converting the SSVM systems to a passive system for Buildings 774, 776, 785, and 786, reducing TCE concentrations in order to protect human health, and reducing USAF LCCs by the end of the period of performance (POP).

The established RAO is to prevent individual human exposure to soil gas vapor levels within buildings at unacceptable levels represented by an excess cancer risk greater than 1×10^{-6} and also represented by a potential non-cancer risk for a hazard index greater than one. Future exit strategy decisions will rely on applicable NYSDOH criteria, pertinent EPA RSLs, or a site-specific human health risk assessment prepared in accordance with EPA guidelines.

Per the Final ROD, if laboratory results indicate that the sub-slab soil gas concentrations are below the NYSDOH "no further action" screening criteria (NYSDOH, October 2006 or updated criteria) and/or EPA industrial use RSLs (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016) for contaminants of concern, the active SSVM systems will be converted into passive SSVM systems. In August 2015, NYSDOH lowered their guideline for TCE in ambient air from 5 $\mu g/m^3$ to 2 $\mu g/m^3$ and developed a recommended immediate action level of 20 $\mu g/m^3$. NYSDOH has declared that TCE is a Matrix 1 pollutant in the Final Guidance for Evaluating Soil Vapor Intrusion, State of New York, October 2006. The Soil Vapor/Matrix 1 table on page 52 of the above guidance presents recommended action based on relationship between sub-slab vapor concentrations and corresponding indoor air concentrations.

To comply with the NYSDOH "no further action" screening criteria, EPA industrial RSLs and the established RAOs, the proposed optimization concentrations for TCE at Buildings 774, 776, 785, and 786 were set at the more stringent of the three criteria indicated above. The NYSDOH criteria specifies to achieve a "no further action" status, indoor ambient air must be below 0.25 $\mu g/m^3$ and the subslab concentration must be less than 50 $\mu g/m^3$ for TCE according to the above referenced matrix.

For comparison, Section 7 of the Final ROD states that the EPA guidance documents for SVI have recently been updated. Specifically, the OSWER *Technical Guide For Assessing And Mitigating The Vapor Intrusion Pathway From Subsurface Vapor Sources to Indoor Air* (EPA, June 2015) and the EPA Memorandum: *Compilation of Information Relating to Early/Interim Actions at Superfund Sites and the TCE IRIS Assessment* (EPA, August 2014). An example of updated information in these guidance is the sub-slab/indoor dilution attenuation factor, which was revised to 33. As a result, using the new guidance, the EPA industrial RSLs for ambient air is

3.0 µg/m^3 and a subslab concentration would be 99 µg/m^3 if the revised dilution attenuation factor were to be employed. Achieving the NYSDOH "no further action" criteria would also satisfy the RAOs since NYSDOH states that "the compound was not detected in the indoor air sample and that the concentration detected in the sub-slab vapor sample is not expected to significantly affect indoor air quality, no additional actions are needed to address human exposures." Reducing TCE concentrations to below RAOs at SD052-SVI is important to meet the performance metrics outlined in the performance model (**Appendix A**).

2.6.3.1 Groundwater Monitoring

As part of the SSVM system conversion criteria, groundwater concentrations of VOCs in the vicinity of the SVE systems will be evaluated to assess the SVI pathway into the buildings. Groundwater monitoring will be conducted under separate remedial efforts at SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776) and will be used to monitoring and evaluate the SSVM systems. Groundwater will be sampled in accordance with the *Final 2016 Update Uniform Federal Policy-Quality Assurance Project Plan for Performance Monitoring at On-Base Groundwater Areas of Concern* (Bhate, November 2016b). Per the Final ROD, the SD052-SVI Sites cannot be closed until the CVOCs in groundwater are detected at or below the RSLs, which will be the primary reason for evaluating the groundwater detections.

2.6.3.2 Sub-Slab Vapor, Indoor, Outdoor, and Influent Monitoring

In August 2015, NYSDOH lowered their guideline for TCE in ambient air from 5 µg/m^3 to 2 µg/m^3 and developed a recommended immediate action level of 20 µg/m^3. NYSDOH has declared that TCE is a Matrix 1 pollutant in the Final Guidance for Evaluating Soil Vapor Intrusion, State of New York, October 2006. The Soil Vapor/Matrix 1 table on page 52 of the above guidance presents recommended action based on relationship between sub-slab vapor concentrations and corresponding indoor air concentrations. All future indoor and sub-slab vapor concentration results will be compared to the above referenced table and the appropriate response taken in order to protect human health and the environment.

Indoor, Outdoor, and Influent Sample Optimization

Bhate anticipates adjusting the sampling frequency for sub-slab, indoor, outdoor, and influent samples for the SSVM system from semi-annual to annually in 2016. Indoor, outdoor, and influent sampling locations will remain unchanged to allow direct comparisons with historical data, however, their sample frequency will be reduced from semi-annual to annual.

Sub-Slab Sample Optimization

The sub-slab vapor monitoring points indicated in Sections 2.4.1.2 and 2.4.2.2 have been sampled on a semi-annual basis. Based on historical data collected from 774VMP-1, -2, and -3 and 776VMP-1, -2, and -3, TCE concentrations at all VMPs associated with Buildings 774/776 have

been below the Sub-Slab Regulatory Action Level for no further action (NFA) at 50 µg/m^3 for Indoor Air < 0.25 µg/m^3 since January 2012. Therefore, Bhate proposed to eliminate 4 of 6 VMPs and retain 774VMP-2 and 776VMP-3. No modification to the VMPs associated with Buildings 785/786 is being requested at this time. Sub-slab concentrations at 785VMP-2, -4, and -5 and 786VMP-1, -2, and -3 appear to be closer to the Sub-Slab Regulatory Action Level for NFA at 50 µg/m^3 for Indoor Air < 0.25 µg/m^3.

Additional post POP activities include the Five-Year Review which will be performed in 2025. Subject to data confirmation and USEPA and NYSDEC concurrence, the monitoring and conversion schedule for SS052-SVI is provided in **Table 1**. **Figure 8 and 9** illustrates the optimization strategy configuration for the systems at Buildings 785/786 and Buildings 774/776, respectively.

Table 1. SD052-SVI Monitoring and Conversion Schedule

Years	Activity	Timing
Period of Performance		
2017	Conversion of the SSVMs from active to passive	USEPA and NYSDEC concurrence, January 2017
2017 through 2020	Annual LUC/IC Inspections	Fall Inspections
	Annual Groundwater Monitoring at SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776)	Annual Monitoring in Fall
	Annual Sub-Slab, Indoor, Outdoor, and Influent Sampling	Annual Monitoring in Fall
	Annual Reporting	4th Quarter (December)
2017 through 2020	Monthly Operations and Maintenance (discontinued upon conversion)	Monthly
2020	Five-Year Review	2nd Quarter (April)
Post-Period of Performance		
2021 through 2025	Annual LUC/IC Inspections	4th Quarter (October)
	Annual Groundwater Monitoring	Annual Monitoring in Fall
	Reporting	4th Quarter (December)
2025	Five-Year Review	2nd Quarter (April)

Period of Performance

Groundwater monitoring will be conducted under separate remedial efforts at SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776) to monitor and evaluate the SSVM systems. Alterations to the frequency and duration of the LTM network will be conducted through the analysis of sampling data trends under the separate remedial efforts. Proposal to reduce the sampling frequency and/or discontinue the

monitoring of a sampling location may be prompted by the indication of a decreasing or stable trend and/or at least two consecutive rounds with VOC levels below applicable NYSDEC Class GA Groundwater Standards.

Unnecessary monitoring wells and remedial system infrastructure will be abandoned to eliminate future LCCs to the USAF. An evaluation will be performed annually during the POP for abandonment recommendations. Abandonment will only be implemented with NYSDEC concurrence.

Post-Period of Performance

As a result of the anticipated reduction of the contaminant plume from the remedial efforts planned for SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776), Bhate anticipates groundwater sampling will be optimized to annually after the POP (2021 through 2025). Samples will be analyzed via USEPA method 8260B. This sampling will be conducted prior to the Five-Year Review.

2.6.3.3 Annual LUC/IC Inspections

LUC/ICs, as required by the ROD, will be maintained in order to protect human health and the environment until the site is closed in 2025. The Annual LUC/IC inspections will be conducted to confirm the implementation and performance of the LUC/ICs. Results will be reported annually in the Annual Monitoring Report.

2.6.3.4 Five-Year Review

The site will be included in the 2020 and 2025 Five-Year Reviews.

2.7 Contingencies

2.7.1 Contingent Remedial Alternatives

If sub-slab soil gas concentrations are reported higher than the industrial use screening criteria cited for two consecutive sampling events, the passive system will be reconnected to the active SSVM systems and the system will be re-started. Following reactivation of the SSVM systems, Bhate will conduct an evaluation to determine the cause of the rebound and if necessary, install up to 12 air inlet wells around Buildings 785 and 786 (6 per building) to control the subsurface airflow and possibly overcome preferential pathways and dead zones that may be impeding the SSVM systems. The air inlet wells are passive and will be installed at the edge of the buildings so as not to induce flow of contamination from an adjacent site. Buildings 774 and 776 achieved the no further action criteria in January 2012 and is unlikely to require contingency action. **Figure 10** illustrates the contingency action system configuration for Buildings 785/786.

2.7.2 Annual LUC/IC Inspections

The LUC/IC site inspections will be maintained at an annual frequency.

2.7.3 Five-Year Review

The Five-Year Review will be maintained at a 5-year frequency.

2.8 Reporting Requirements

During the POP at SD052-SVI, the following deliverables are anticipated:

- Annual Monitoring Reports
- Remedial Design Modification Work Plan
- Construction Completion Report
- OES Report
- Five-Year Review (2020)

3 SUMMARY OF OPTIMIZATION AT SD052-SVI

Optimization of the SD052-SVI will be completed in compliance with the Final ROD (AFCEC, September 2016). VOCs detected in groundwater at Sites SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776) currently exceed their associated cleanup levels, which prevents permanent deactivation of the SSVMs systems. Optimization of the selected remedy provides the USAF with the lowest LCCs and liabilities, while ensuring compliance with the RAOs and protectiveness of human receptors.

The proposed optimization is based upon groundwater data coupled with regular remedial system O&M and LUC/IC inspections. The proposed reductions in sub-slab, indoor, outdoor, and influent sampling frequency; and conversion from an active to a passive SSVM system will ensure compliance with the ROD and protect human health and the environment. **Table 2** summarizes the optimization proposed for SD052-SVI within the POP. **Table 3** summarizes the optimized sampling program within the POP.

This page intentionally left blank.

4 REFERENCES

Air Force Civil Engineer Center. August 2016. *Final Proposed Plan Soil Vapor Intrusion at SD-052-02 Building 775 Site (Buildings 774 and 776) and SD-052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) Former Griffiss Air Force Base Site Rome, New York*

Air Force Civil Engineer Center. September 2016. *Final Record of Decision Soil Vapor Intrusion at SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) Former Griffiss Air Force Base, Rome, New York*

Air Force Real Property Agency. December 2008. *Final Record of Decision for the On-base Groundwater AOC (SD-52), Former Griffiss Air Force Base, Rome, New York*

Air Force Real Property Agency. July 2011. *Final Record of Decision for the Nosedocks 1 and 2 Area of Concern at the Former Griffiss Air Force Base, Rome, New York*.

Bhate. November 2016a. *Final 2016 Update Uniform Federal Policy - Quality Assurance Project Plan for Long Term Management Former Griffiss Air Force Base Rome, New York*.

Bhate. November 2016b. *Final 2016 Update Uniform Federal Policy-Quality Assurance Project Plan for Performance Monitoring at On-Base Groundwater Areas of Concern. Former Griffiss Air Force Base Rome, New York*.

Cape/FPM. May 2015. *Final Quarterly Operations and Maintenance Data Summary Report (4th Quarter/Calendar Year 2014) SD052 (Buildings 774, 776, 785, and 786) Monitoring Program Former Griffiss Air Force Base Rome, New York.*

Cape/FPM. July 2016. *Final Quarterly Operations and Maintenance Report SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) Sub-Slab Vapor Mitigation Systems (2nd Quarter/Calendar Year 2016/April – June), Former Griffiss Air Force Base Rome, New York*.

Ecology & Environment Engineering, P.C. (EEEPC) February 2007. *Final Predesign Investigation, Data Summary Report at Landfill 6, Building 817/WSA, Building 775, Pumphouse 3, and AOC 9*.

EEPC. August 2013. *Final Demonstration of Remedial Actions Operating Properly and Successfully Nosedocks/Apron 2 Former Griffiss Air Force Base Remove, New York*.

FPM Group Ltd. April 2008. *Final Work Plan for Soil Vapor Intrusion Sampling at Multiple Sites*, *Former Griffiss Air Force Base*, Revision 0.0.

FPM Group Ltd. February 2010. *Final Feasibility Study Evaluation of Alternatives and Conceptual Design of Soil Vapor Mitigation at Buildings 774, 776, 785 and 786, Former Griffiss Air Force Base, Rome, New York.*

FPM Remediation, Inc. February 2011. *Draft Work Plan Sub-Slab Vapor Mitigation Design.*

NYSDEC. June 1998. *Technical and Operational Guidance* Series 1.1.1.

NYSDOH. October 2006. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. http://www.health.ny.gov/environmental/investigations/soil_gas/svi_guidance/docs/svig_final2006_complete.pdf.

TABLES

Table 2

SSVM Optimization Summary

Field Activities	Current Approach	Optimizaton Approach	Rationale	Location	Parameters
System Component Readings	Weekly recording of system temperature, flow, vacuum, and motor status to determine proper operation.	Monthly recording of system temperature, flow, vacuum, and motor status to determine proper operation.	Operation and maintenance logs suggest the system operates without significant human intervention. Function will be eliminated upon implementation of passive conversion.	Building 774/776 Blower Shed and Building 785/786 Blower Shed	None
Vapor Monitoring Point (VMP) Vacuum Measurements	Semi-annual recording to support sub-slab depressurization.	Annual recording to support sub-slab depressurization.	Collected simultaneously during annual sampling All influent sampling results indicated a stable or slightly decreasing trend in TCE	VMPs inside buildings as shown on Figures 4 and 6	None
Granular Activated Carbon (GAC) Replacement	Every 4 months to adsorb extracted chlorinated solvent vapors.	Once before the end of the POP.	The calculated life span of GAC was 4 months based on concentrations encountered during the pilot study from October 2010 to January 2011 at Building 785 and Building 786. Current influent concentrations using the maximum detection over the past 2 years indicates the 140 pound GAC vessel is sufficient to last approximately 40 years.	Building 774/776 Blower Shed and Building 785/786 Blower Shed	None
Indoor Air Sampling	Semi-annually to evaluate current human exposure and to obtain site specific attenuation factors for risk assessment (ratio of indoor air to sub-slab vapor concentrations).	Annually to evaluate current human exposure and to obtain site specific attenuation factors for risk assessment (ratio of indoor air to sub-slab vapor concentrations).	From 2011 to present, all indoor concentrations were below New York State Department of Health (NYSDOH) screening criteria and/or 2016 industrial U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) and did not pose any unacceptable risk to building occupants.	One sample per building as shown on Figures 4 and 6	VOC: Method TO-15 Full List
Outdoor Air Sampling	Semi-annually to occur simultaneously with indoor air sampling to evaluate potential influence of outdoor air on indoor air sampled.	Annually to occur simultaneously with indoor air sampling to evaluate potential influence of outdoor air on indoor air sampled.	From 2011 to present, all outdoor concentrations were below NYSDOH screening criteria and/or 2016 industrial USEPA RSLs and did not pose any unacceptable risk to building occupants.	One sample per site as shown on Figures 4 and 6	VOC: Method TO-15 Full List
Sub-Slab Vapor Sampling	Semi-annually to occur simultaneously with indoor air sampling to evaluate chlorinated solvent transport and mitigation and to obtain site specific attenuation factors for risk assessment (ratio of indoor air to sub-slab vapor concentrations).	Annually to occur simultaneously with indoor air sampling to evaluate chlorinated solvent transport and mitigation and to obtain site specific attenuation factors for risk assessment (ratio of indoor air to sub-slab vapor concentrations).	All sub-slab concentrations were at or below NYSDOH screening criteria and/or 2016 industrial USEPA RSLs.	VMPs inside buildings as shown on Figure 4 and 6	VOC: Method TO-15 Full List

Table 2

SSVM Optimization Summary

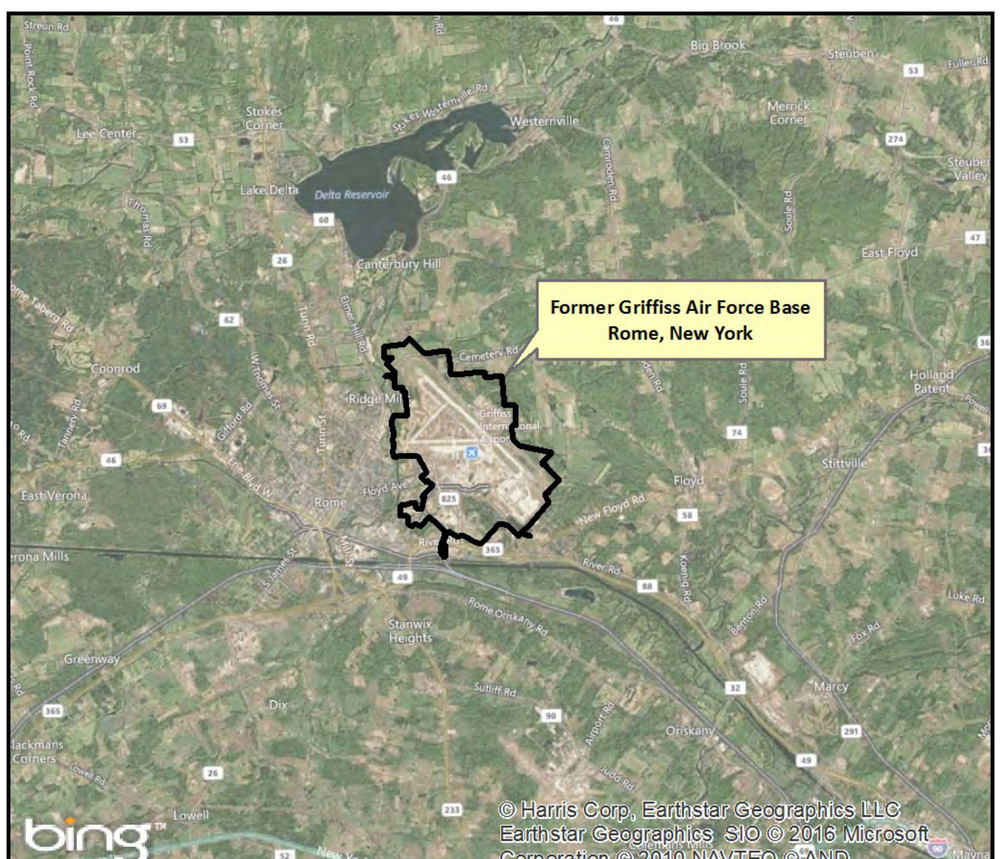
Field Activities	Current Approach	Optimizaton Approach	Rationale	Location	Parameters
Influent Sampling	Semi-annually prior to sub-slab sampling to determine soil vapor extraction.	Annually prior to sub-slab sampling to determine soil vapor extraction.	Synch with annual sampling program. All influent sampling results indicated a stable or slightly decreasing trend in TCE.	Sub-slab vapor monitoring (SSVM) system's exhaust stack before carbon treatment	VOC: Method TO-15 Full List
Wind-powered exhaust turbines	Not applicable	Active to passive SSVMs conversion	Passive approach: Due to continued groundwater contamination greater than groundwater applicable or relevant and appropriate requirements (ARARs) at SD052-02 Building 775 Site (Buildings 774 and 776) and SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786), site closeout is not possible at this time.	Building 774 / 776 Blower Shed and Building 785 / 786 Blower Shed	None

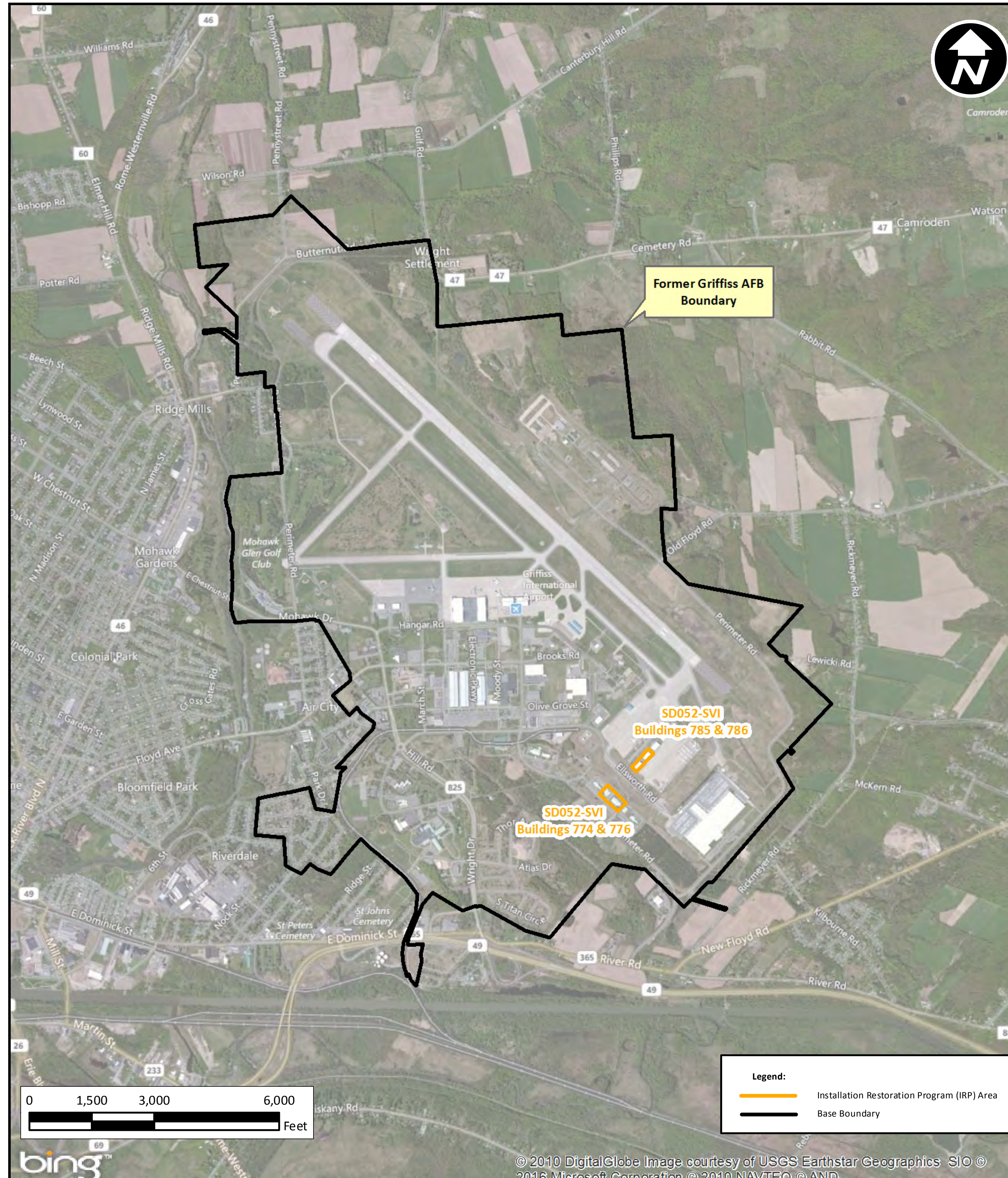
Table 3

Building 774, 776, 785 and 786 Sub-Slab Sampling Analysis Summary

Current Monitoring Network	Current Monitoring Network Number of Samples Per Year	Optimized Network	Optimized Network Number of Samples Per Year	Sampling Rationale	Target Analytes/U.S. Environmental Protection Agency (USEPA) Method Number	Evaluation Criteria
774-SSVM 774VMP-1 774VMP-2 774VMP-3 **776-SSVM** 776VMP-1 776VMP-2 776VMP-3 **785-SSVM** 785VMP-2 785VMP-4 785VMP-5 **786-SSVM** 786VMP-1 786VMP-2 786VMP-3	One sub-slab sample per vapor monitoring point (VMP) or sub-slab vapor point semi-annually (24 total samples) 774SSV, 776SSV, 785SSV, 786SSV vapor monitoring points are available but haven't been sampled since 2008.	**774-SSVM** 774VMP-2 **776-SSVM** 776VMP-3 **785-SSVM** 785VMP-2 785VMP-4 785VMP-5 **786-SSVM** 786VMP-1 786VMP-2 786VMP-3	One sub-slab sample per VMP or sub-slab vapor point-Annually (8 total samples)	To determine the influence of the sub-slab vapor mitigation (SSVM) system.	Volatile Organic Compounds (VOCs)/ TO-15	Annual soil gas sampling will be performed at VMPs. A decreasing trend shows effectiveness of SSVM.

FIGURES





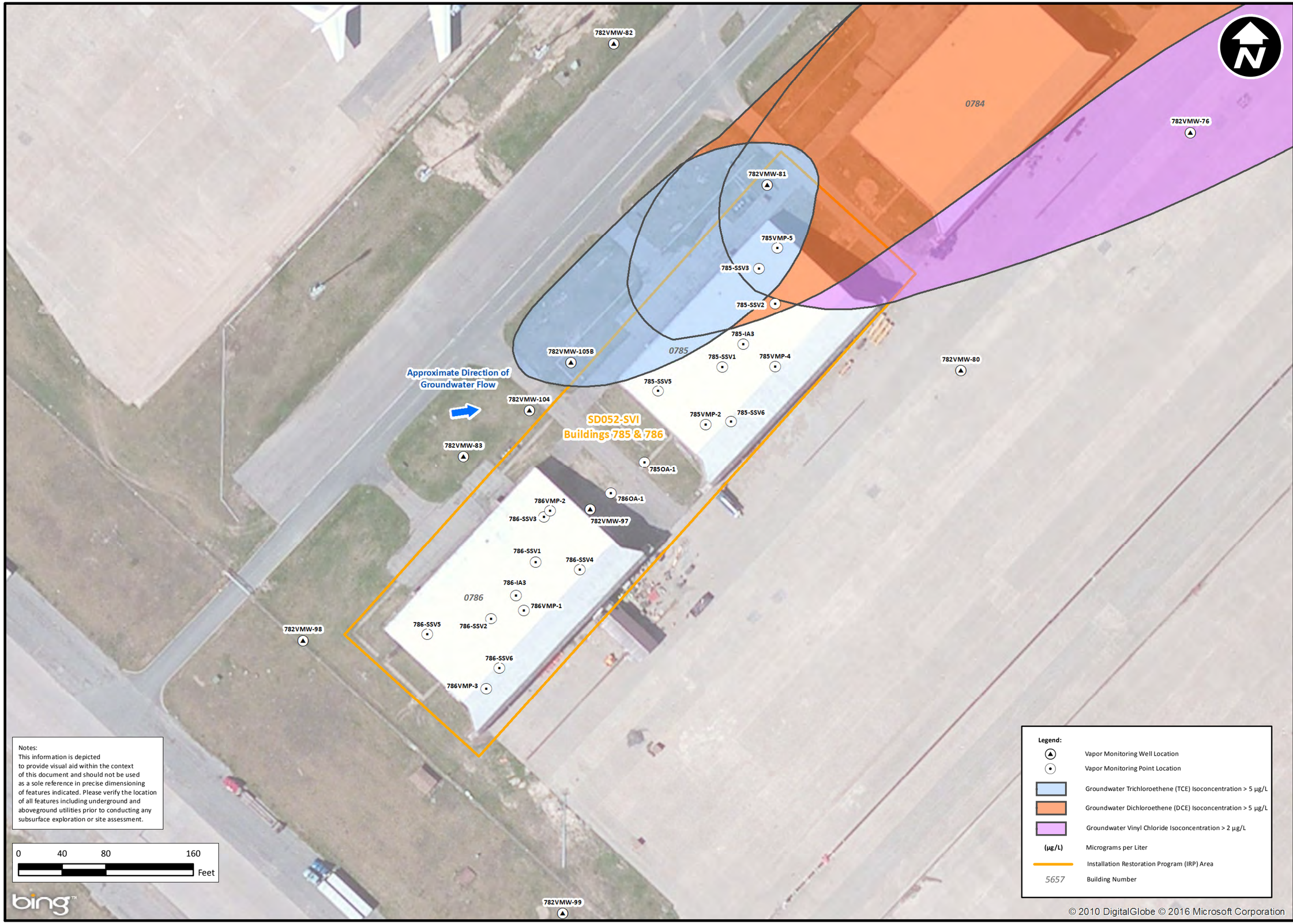
Former Griffiss Air Force Base
Site Location Map

Figure 1

Optimization Plan for Soil Vapor Intrusion at
SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and
SD052-02 Building 775 Site (Buildings 774 and 776)
Former Griffiss Air Force Base, Rome, New York

DRAWN BY:	MRM
DATE:	12/6/2016
SCALE:	As Shown
PROJECT NO:	AFCGSA3.0012.00AA.2010.0004

bhate ENVIRONMENT INFRASTRUCTURE



Building 785 & 786 Site Features

Figure 2

Optimization Plan for Soil Vapor Intrusion at
SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and
SD052-02 Building 775 Site (Buildings 774 and 776)
Former Griffiss Air Force Base, Rome, New York

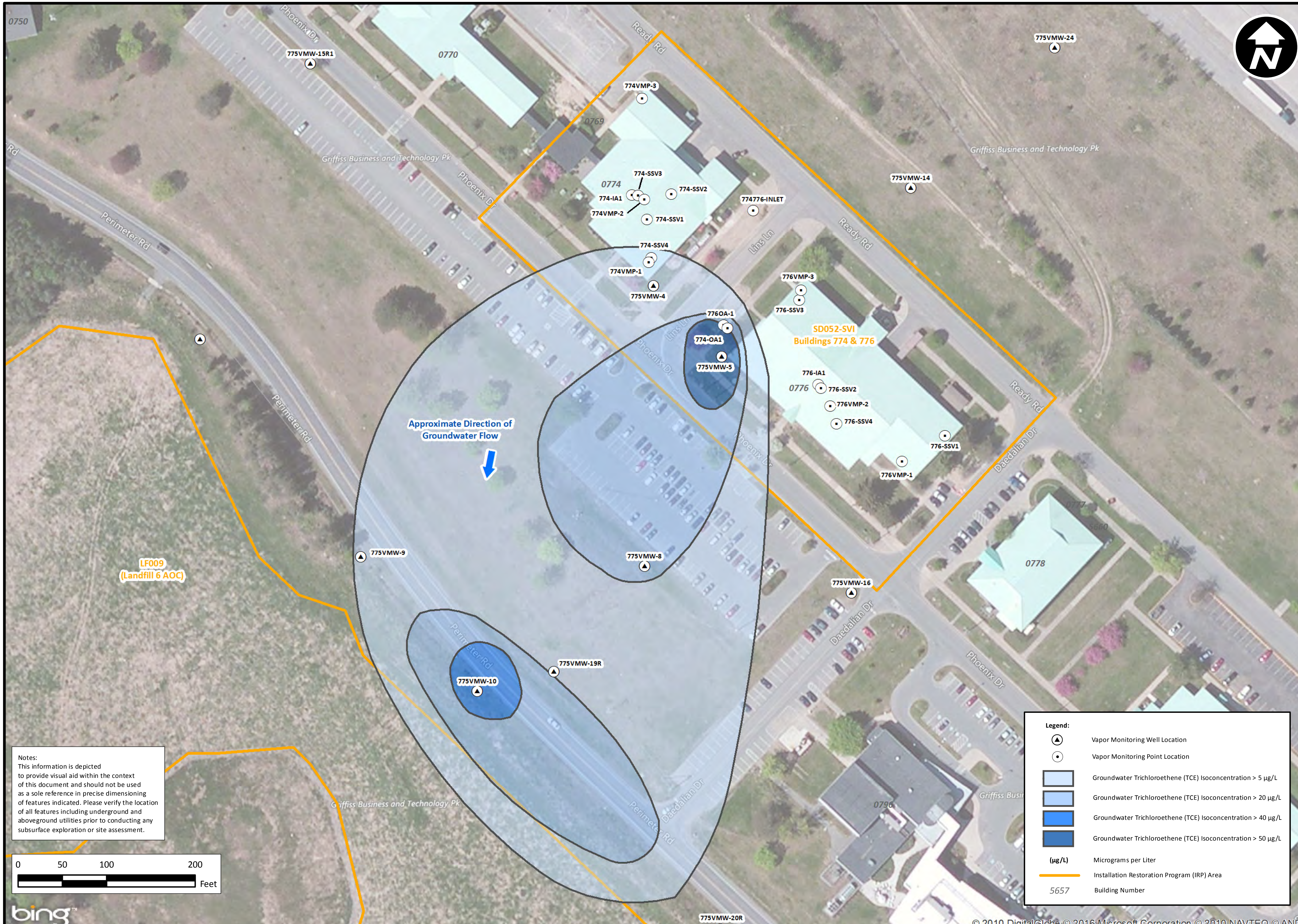
DRAWN BY: MRM

DATE: 12/6/2016

SCALE: As Shown

PROJECT NO: AFCGSA3.0012.00AA.2010.0004

bhate ENVIRONMENT INFRASTRUCTURE



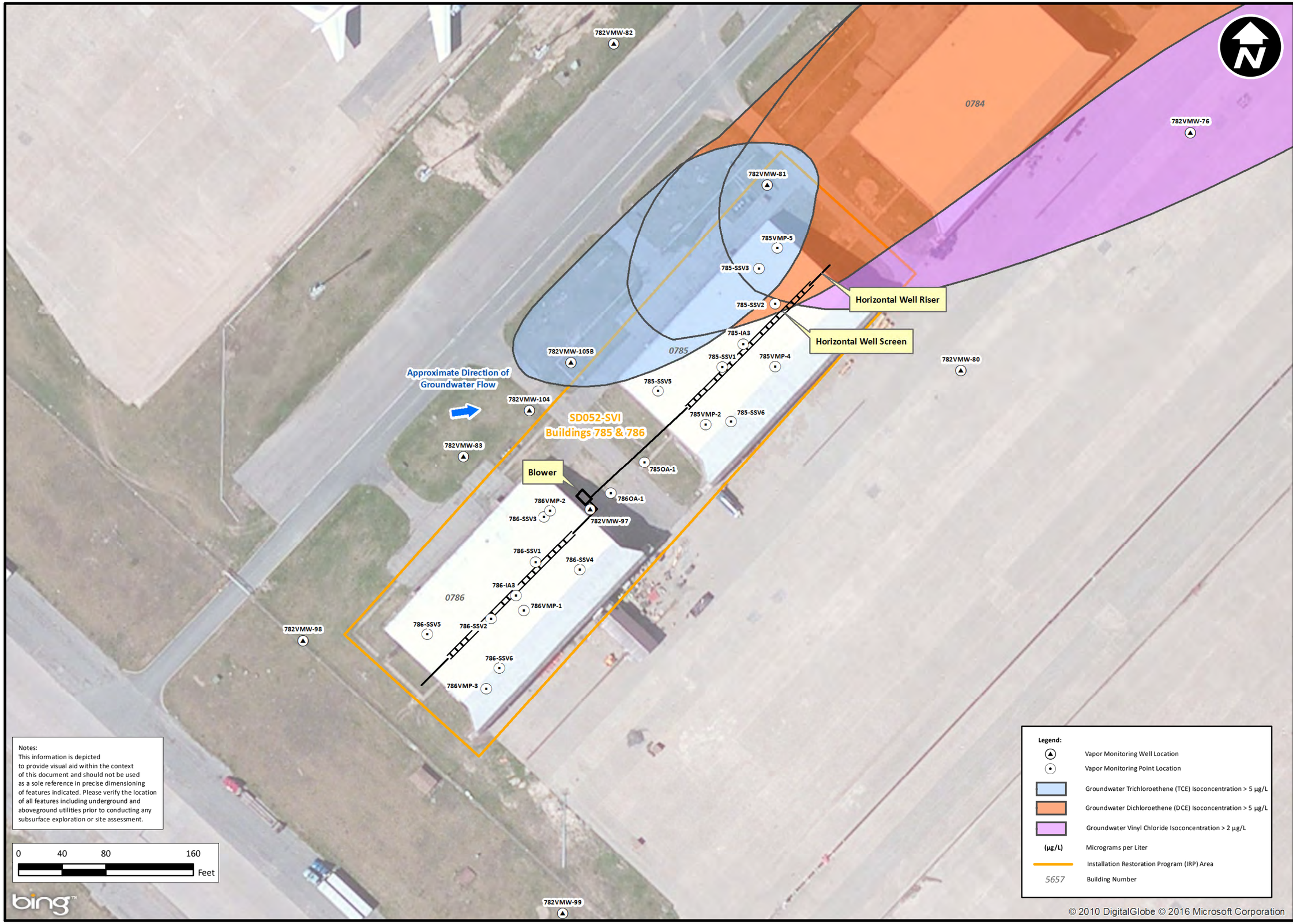
Buildings 774 and 776 Site Features

Figure 3

Optimization Plan for Soil Vapor Intrusion at
SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and
SD052-02 Building 775 Site (Buildings 774 and 776)
Former Griffiss Air Force Base, Rome, New York

DRAWN BY:	MRM
DATE:	12/6/2016
SCALE:	As Shown
PROJECT NO:	AFCGSA3.0012.00AA.2010.0004

bhate
ENVIRONMENT
INFRASTRUCTURE



Buildings 785 and 786 SSVM System

Figure 4

Optimization Plan for Soil Vapor Intrusion at
SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and
SD052-02 Building 775 Site (Buildings 774 and 776)
Former Griffiss Air Force Base, Rome, New York

DRAWN BY: MRM

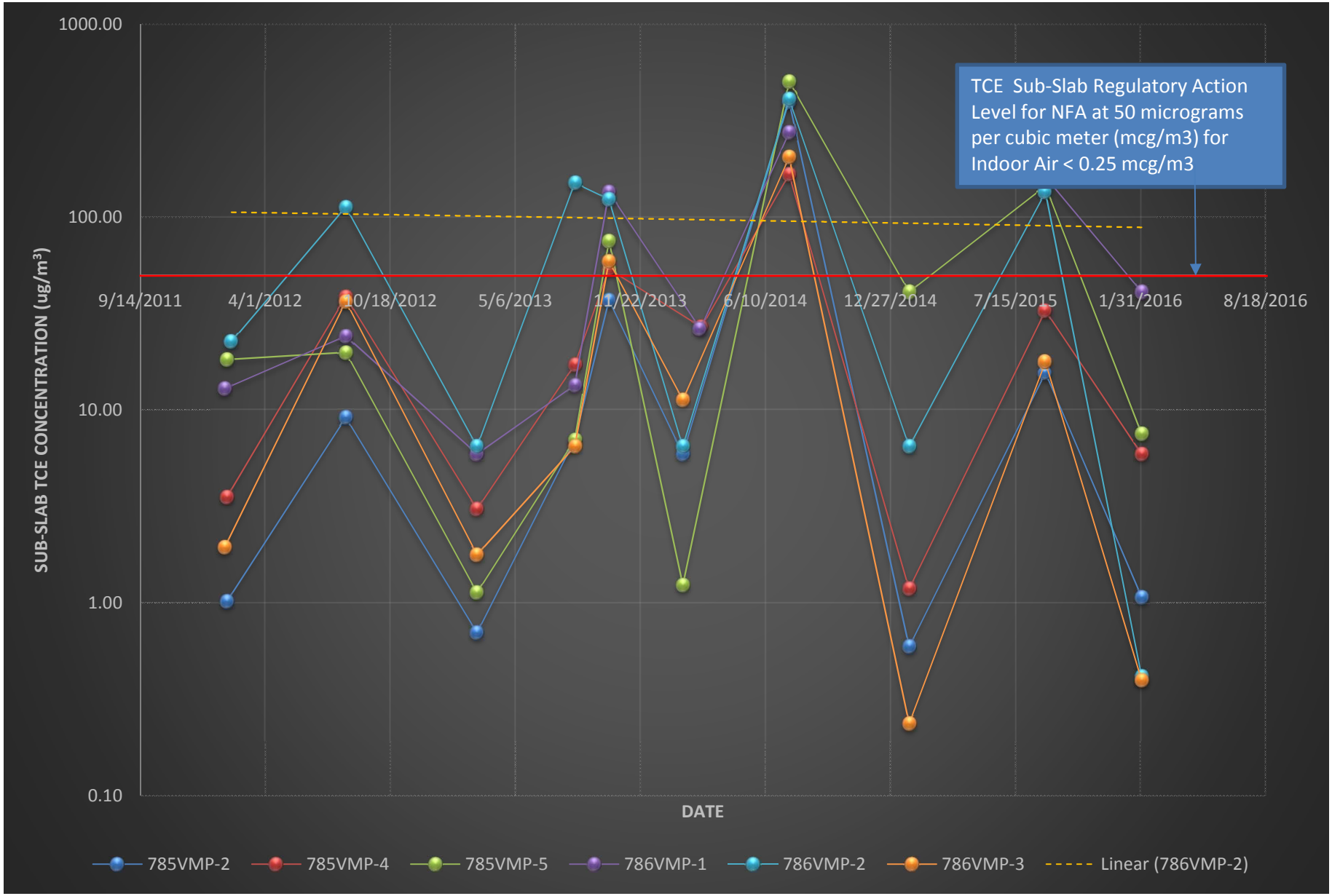
DATE: 12/6/2016

SCALE: As Shown

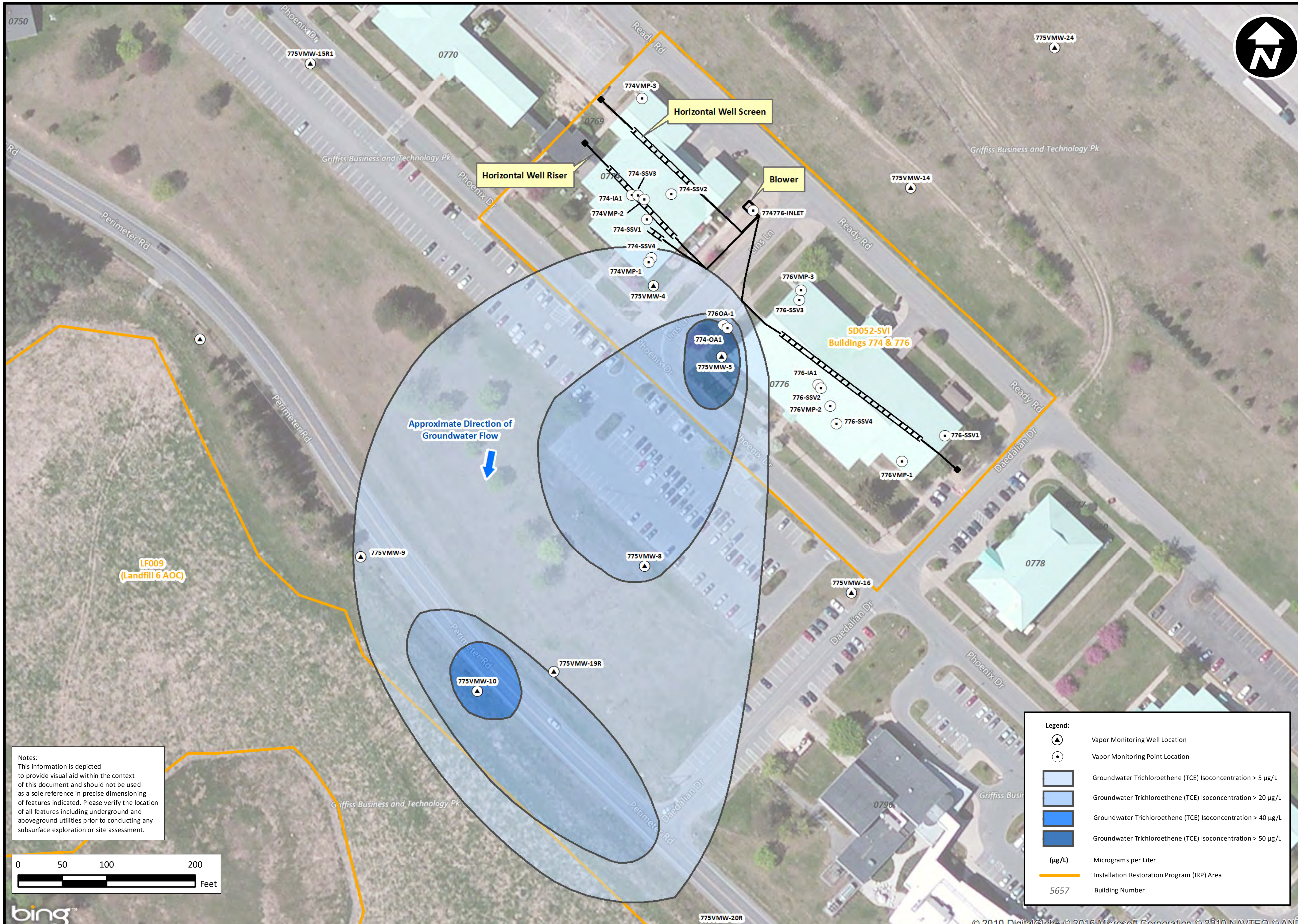
PROJECT NO: AFCGSA3.0012.00AA.2010.0004

bhate ENVIRONMENT INFRASTRUCTURE

Figure 5 SD-052-SVI
Sub-Slab Vapor Monitoring at Bldgs 785 and 786
Griffiss AFB, Rome, NY



bhate ENVIRONMENT INFRASTRUCTURE



N
Horizontal Well Screen
Horizontal Well Riser
Blower
774VMP-3
774-SSV3
774-SSV2
774-IA1
774VMP-2
774-SSV1
774-SSV4
774VMP-1
775VMW-4
774776-INLET
776VMP-3
776-SSV3
776OA-1
774-OA1
775VMW-5
SD052-SVI
Buildings 774 & 776
776-IA1
776-SSV2
776VMP-2
776-SSV4
776-SSV1
776VMP-1
775VMW-15R1
775VMW-24
775VMW-14
775VMW-9
775VMW-8
775VMW-16
775VMW-19R
775VMW-10
775VMW-20R
Approximate Direction of Groundwater Flow
LF009
(Landfill 6 AOC)
0750
0770
0769
0776
0778
0796
Phoenix Dr
Ready Rd
Perimeter Rd
Daedalian Dr
Griffiss Business and Technology Pk
Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 50 100 200
Feet
Legend:
Vapor Monitoring Well Location
Vapor Monitoring Point Location
Groundwater Trichloroethene (TCE) Isoconcentration > 5 µg/L
Groundwater Trichloroethene (TCE) Isoconcentration > 20 µg/L
Groundwater Trichloroethene (TCE) Isoconcentration > 40 µg/L
Groundwater Trichloroethene (TCE) Isoconcentration > 50 µg/L
(µg/L) Micrograms per Liter
Installation Restoration Program (IRP) Area
5657 Building Number
bing
© 2010 DigitalGlobe © 2016 Microsoft Corporation © 2010 NAVTEQ © AND

Figure 6

Buildings 774 and 776 SSVM System

Optimization Plan for Soil Vapor Intrusion at SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776)
Former Griffiss Air Force Base, Rome, New York

DRAWN BY: MRM

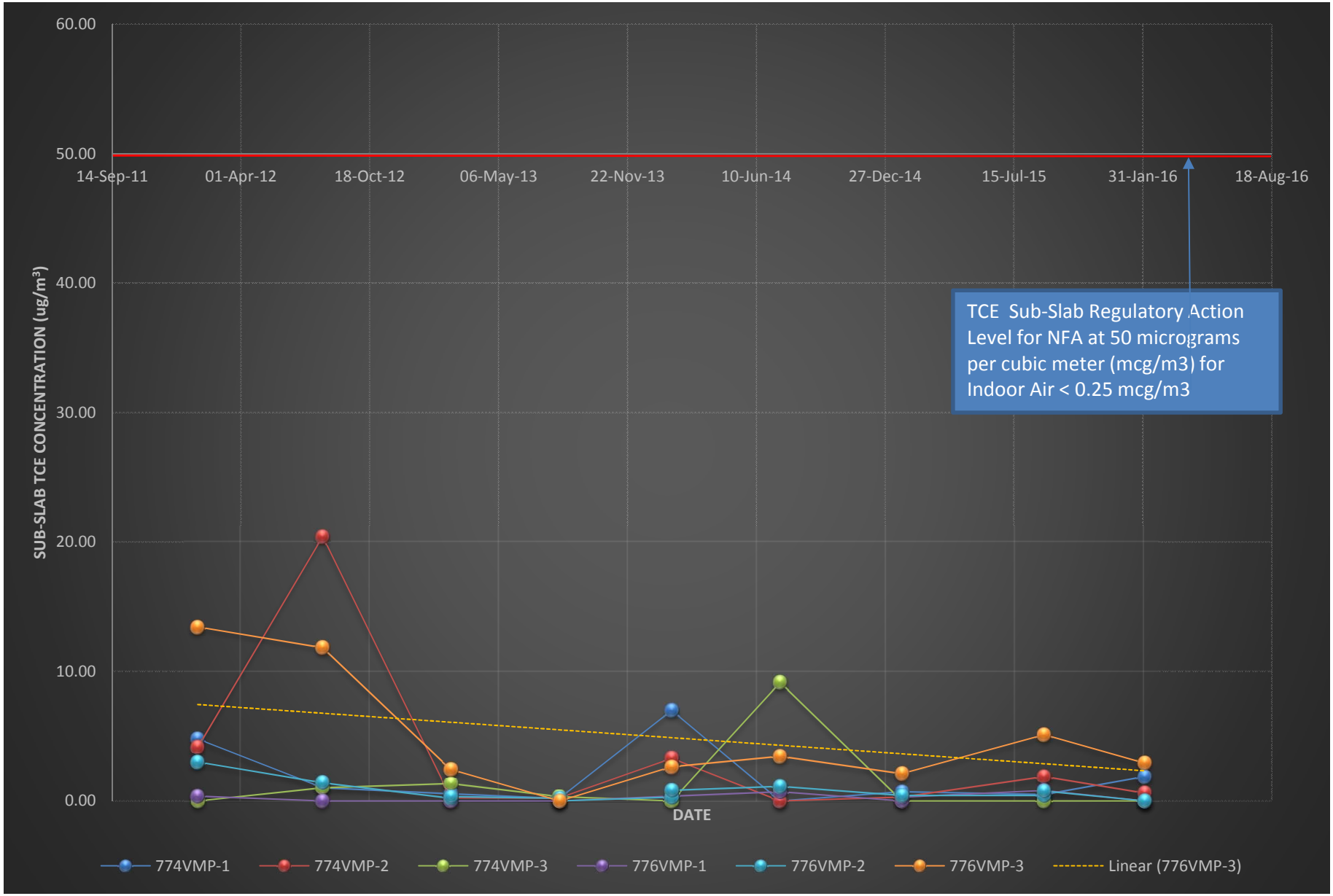
DATE: 12/6/2016

SCALE: As Shown

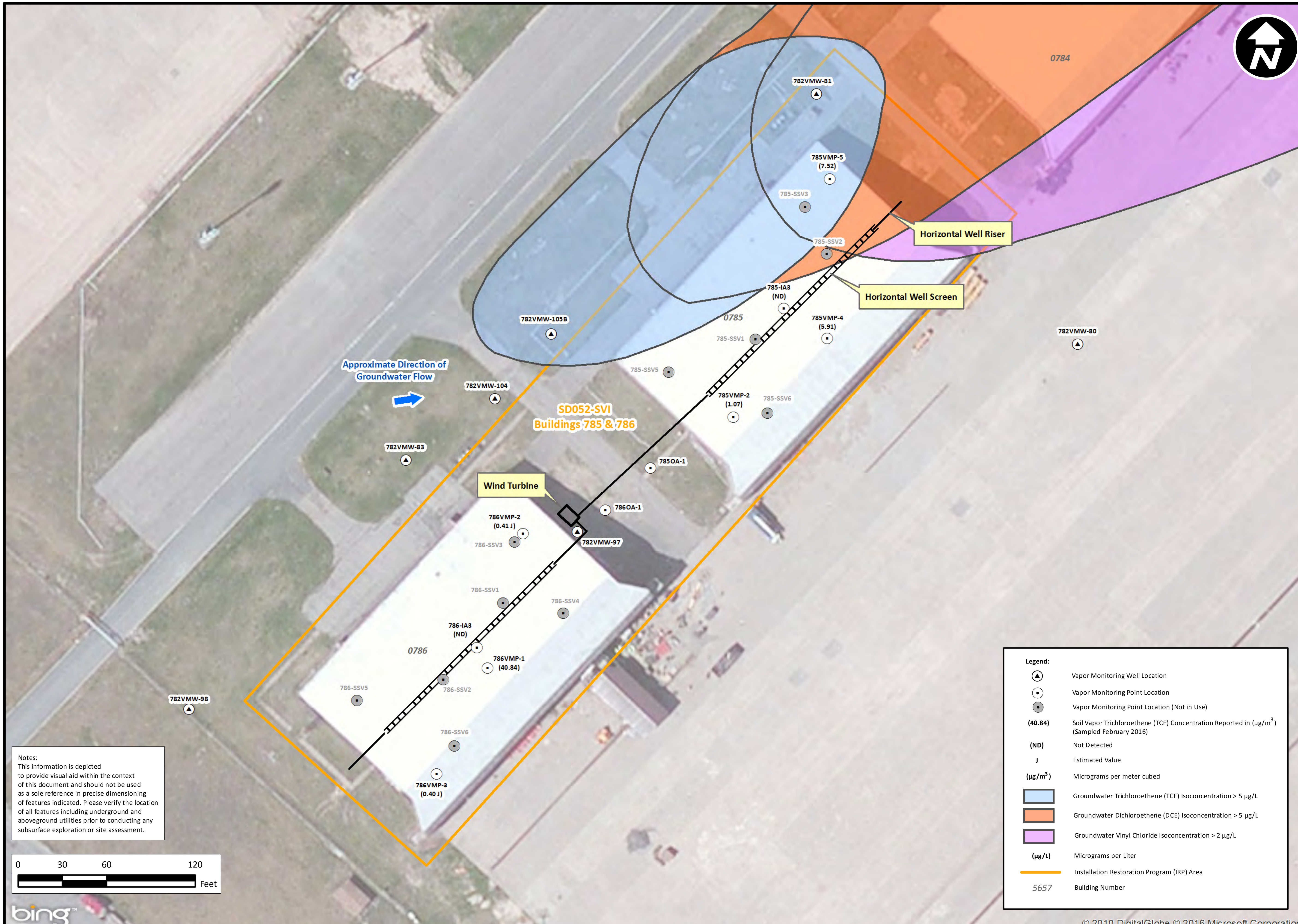
PROJECT NO: AFCGSA3.0012.00AA.2010.0004

bhate ENVIRONMENT INFRASTRUCTURE

Figure 7 SD-052-SVI
Sub-Slab Vapor Monitoring at Bldgs 774 and 776
Griffiss AFB, Rome, NY



bhate ENVIRONMENT INFRASTRUCTURE


0784
782VMW-81
785VMP-5
(7.52)
785-SSV3
785-SSV2
Horizontal Well Riser
Horizontal Well Screen
785-IA3
(ND)
0785
785VMP-4
(5.91)
785-SSV1
782VMW-105B
782VMW-80
785-SSV5
Approximate Direction of
Groundwater Flow
782VMW-104
785VMP-2
(1.07)
785-SSV6
SD052-SVI
Buildings 785 & 786
782VMW-83
785OA-1
Wind Turbine
786OA-1
786VMP-2
(0.41 J)
786-SSV3
782VMW-97
786-SSV1
786-SSV4
786-IA3
(ND)
0786
786VMP-1
(40.84)
786-SSV5
786-SSV2
782VMW-98
786-SSV6
786VMP-3
(0.40 J)
Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 30 60 120
Feet
Legend:
Vapor Monitoring Well Location
Vapor Monitoring Point Location
Vapor Monitoring Point Location (Not in Use)
(40.84) Soil Vapor Trichloroethene (TCE) Concentration Reported in (µg/m3) (Sampled February 2016)
(ND) Not Detected
J Estimated Value
(µg/m3) Micrograms per meter cubed
Groundwater Trichloroethene (TCE) Isoconcentration > 5 µg/L
Groundwater Dichloroethene (DCE) Isoconcentration > 5 µg/L
Groundwater Vinyl Chloride Isoconcentration > 2 µg/L
(µg/L) Micrograms per Liter
Installation Restoration Program (IRP) Area
5657 Building Number
© 2010 DigitalGlobe © 2016 Microsoft Corporation
bing

Optimization Strategy Configuration for Buildings 785 and 786 SSVM System

Figure 8

Optimization Plan for Soil Vapor Intrusion at SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and SD052-02 Building 775 Site (Buildings 774 and 776) Former Griffiss Air Force Base, Rome, New York

DRAWN BY: MRM

DATE: 12/6/2016

SCALE: As Shown

PROJECT NO: AFCGSA3.0012. 00AA.2010.0004

bhate ENVIRONMENT INFRASTRUCTURE

Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

Optimization Strategy Configuration for Buildings 774 and 776 SSVM System

Figure 9

Optimization Plan for Soil Vapor Intrusion at
SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and
SD052-02 Building 775 Site (Buildings 774 and 776)
Former Griffiss Air Force Base, Rome, New York

DRAWN BY: MRM

DATE: 12/6/2016

SCALE: As Shown

PROJECT NO: AFCGSA3.0012.00AA.2010.0004

bhate ENVIRONMENT INFRASTRUCTURE

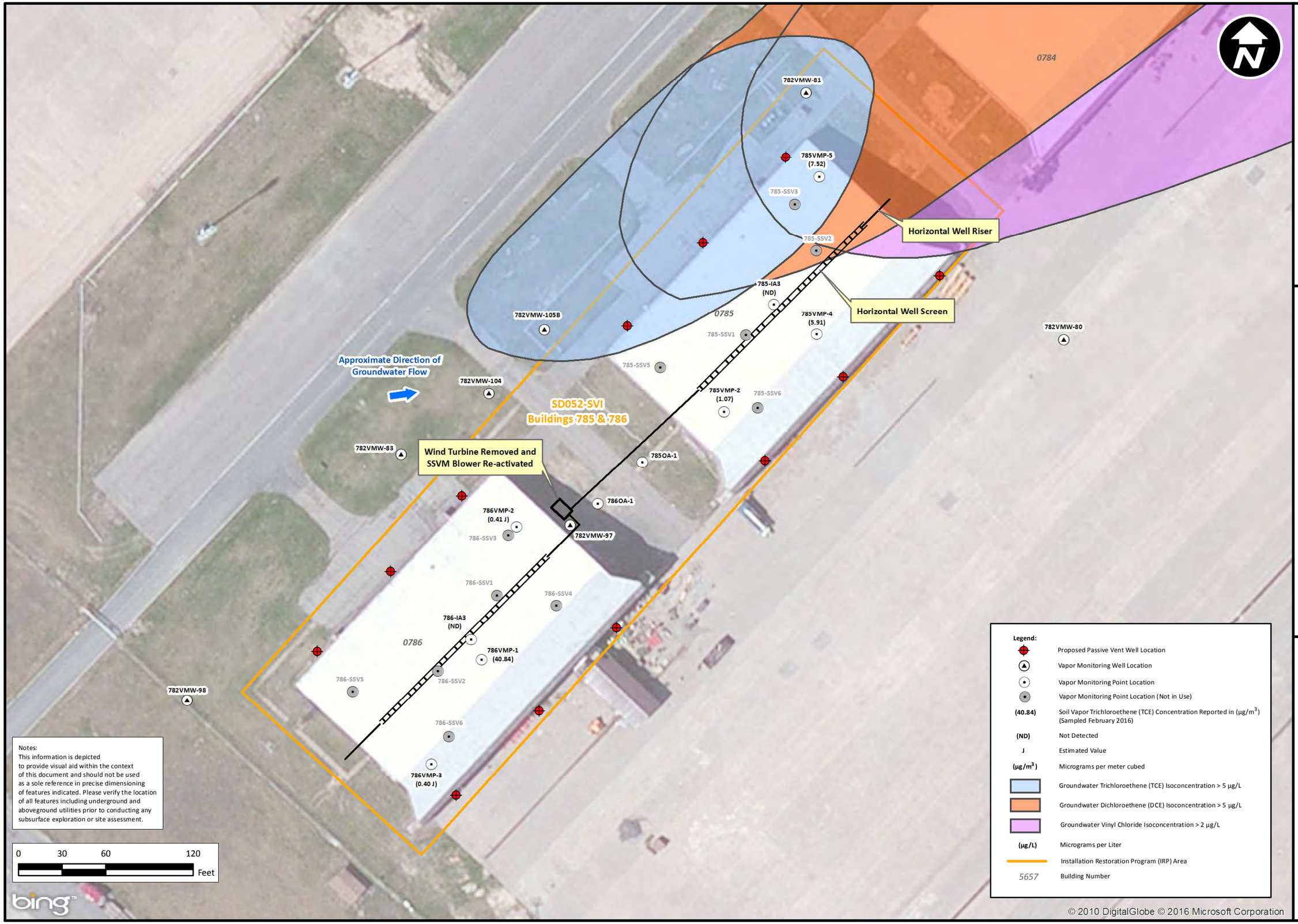
0770
0769
0774
0776
0778
Griffiss Business and Technology Pk
Ready Rd
Phoenix Dr
Lins Ln
Daedalian Dr
Perimeter Rd

775VMW-15R1
774VMP-3 (ND)
Horizontal Well Screen
Horizontal Well Riser
774-SSV3
774-IA1 (ND)
774-SSV2
774VMP-2 (0.59 J)
774-SSV1
774-SSV4
774VMP-1 (1.88)
775VMW-4
Wind Turbine
774776-INLET
775VMW-24
775VMW-14
776VMP-3 (2.90 J)
776-SSV3
SD052-SVI
Buildings 774 & 776
776OA-1
774-OA1
775VMW-5
776-IA1 (0.28 J)
776-SSV2
776VMP-2 (ND)
776-SSV4
776-SSV1
776VMP-1 (ND)
Approximate Direction of Groundwater Flow
775VMW-9
775VMW-8
775VMW-16
775VMW-19R
775VMW-10
LF009 (Landfill 6 AOC)

0 40 80 160 Feet

Legend:

- Vapor Monitoring Well Location
- Vapor Monitoring Point Location
- Vapor Monitoring Point Location (Not in Use)
- (1.88) Soil Vapor Trichloroethene (TCE) Concentration Reported in ($\mu g/m^3$) (Sample February 2016)
- (ND) Not Detected
- J Estimated Value
- ($\mu g/m^3$) Micrograms per meter cubed
- Groundwater Trichloroethene (TCE) Isoconcentration > 5 µg/L
- Groundwater Trichloroethene (TCE) Isoconcentration > 20 µg/L
- Groundwater Trichloroethene (TCE) Isoconcentration > 40 µg/L
- Groundwater Trichloroethene (TCE) Isoconcentration > 50 µg/L
- (µg/L) Micrograms per Liter
- Installation Restoration Program (IRP) Area
- 5657 Building Number



Contingency Action Configuration for Buildings 785 and 786 SSVM System

Figure 10

Optimization Plan for Soil Vapor Intrusion at
SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785 and 786) and
SD052-02 Building 775 Site (Buildings 774 and 776)
Former Griffiss Air Force Base, Rome, New York

DRAWN BY: MRM

DATE: 12/6/2016

SCALE: As Shown

PROJECT NO: AFCGSA3.0012.00AA.2010.0004

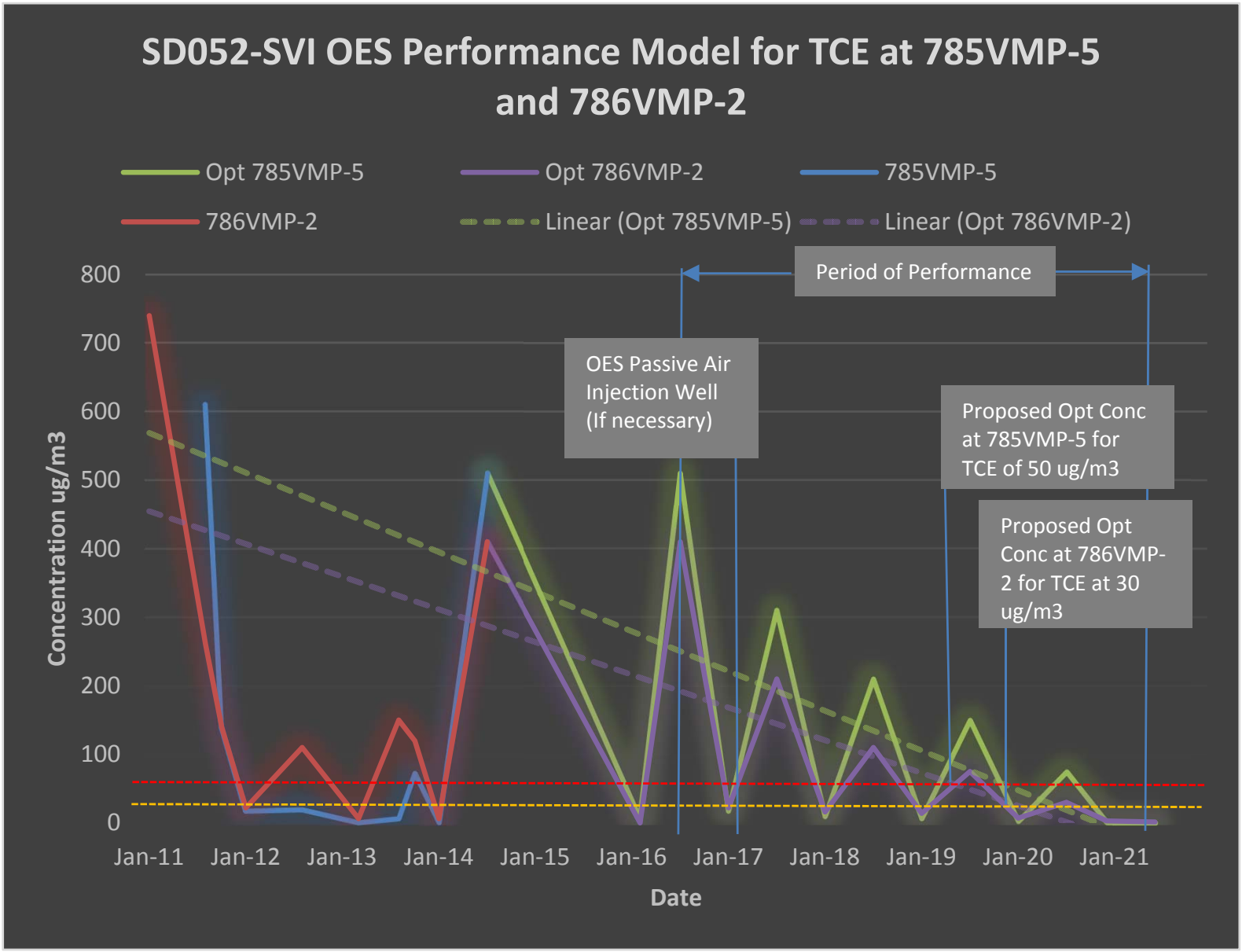
bhate ENVIRONMENT INFRASTRUCTURE

APPENDIX A
PERFORMANCE MODEL

PERFORMANCE MODEL

The proposed end point is optimization by converting the Sub-Slab Vapor Mitigation (SSVM) system to a passive system for SD052-01 Apron 2 Chlorinated Plume Site (Buildings 785/786), reducing trichloroethene (TCE) concentrations in order to protect human health and the environment and to reduce U.S. Air Force (USAF) Life Cycle Costs (LCCs) by the end of the period of Performance (POP). Reducing TCE concentrations to below Remedial Action Objectives (RAOs) at SD052-Soil Vapor Intrusion (SVI) is important to meet the performance metrics outlined in the performance model below.

To assess and predict the TCE concentrations at site SD052-SVI, historical sub-slab data were compiled for 786VMP-2 and 785VMP-5 between January 2011 to July 2014. The concentrations at these vapor monitoring points appears to be seasonally influenced over the same time frame therefore this concentration oscillation will be incorporated into the out-year predictions of the performance model. The concentration data were then plotted against its associated sampling date and a linear regression line fitted to the data to project when the sub-slab concentrations will reach the proposed optimization concentrations for TCE at Buildings 785/786, 786VMP-2 and 785VMP-5 which were set at 30 micrograms per cubic meter ($\mu g/m^3$) and 50 $\mu g/m^3$, respectively. The extrapolation suggests that the proposed optimization concentrations will be achieved during the Spring of 2020. However, recent sampling results collected during the February 2016 sampling event indicate that results at 786VMP-2 and 785VMP-5 detected TCE concentrations at 0.41 J $\mu g/m^3$ and 7.3 $\mu g/m^3$, respectively. Note: The baseline sampling events for 786VMP-2 and 785VMP-5 will likely not occur until November 2016; therefore, the performance models may have to be updated (if necessary). Note: The original optimization concentrations from the proposal indicated that 786VMP-2 and 785VMP-5 were set at 30 $\mu g/m^3$ and 75 $\mu g/m^3$, respectively. However, to comply with the NYSDOH "no further action" criteria, the proposed optimization concentration for 785VMP-5 was reduced to 50 $\mu g/m^3$.



bhate ENVIRONMENT INFRASTRUCTURE