



Ms. Algeana Stevenson
DPW Prevention and Compliance Branch
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Subject:

Proposed Supplemental Investigation for HAA-01 (Fire Training Site), HAA-15 (MCA Barracks Site), and HAA-17 (TCE Groundwater Contamination), at Hunter Army Airfield, Savannah, Georgia

Dear Ms. Stevenson:

The PIKA International, Inc. (PIKA) - ARCADIS U.S., Inc. (ARCADIS) Joint Venture (the JV) has been retained by the United States Army Environmental Command (USAEC) to perform investigation and remediation activities in support of the Environmental Restoration Program at Hunter Army Airfield (HAAF). HAAF is located in Chatham County, in the southwestern portion of Savannah, Georgia. The JV's work at HAAF is being conducted as part of performance based contract W9124J-13-D-0009 Task Order 0004.

Remedial investigations have been on-going at HAA-01, HAA-15, and HAA-17. The last investigations were completed in 2010. The JV has reviewed all of the historical data and recommends a limited supplemental investigation prior to finalizing the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Investigation (RI)/ Feasibility Study (FS) Report. The investigation will include collection of groundwater, surface water, and sediment samples to confirm current conditions and installation of additional monitoring wells to address remaining data gaps. A vapor intrusion (VI) evaluation will also be completed for each Site in accordance with United States Environmental Protection Agency (USEPA) guidelines. Initial VI modeling will be completed to evaluate the potential for VI at each site. If a potential risk is identified, a work plan will be submitted for collection of soil gas and/or sub-slab samples to further evaluate the potential risk. Results of the VI evaluation will be incorporated into the CERCLA RI/FS report.

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June 17, 2014

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Our ref:

10153001

The proposed scope for the supplemental investigation will include:

- Installation of additional monitoring wells at HAA-15 and HAA-17.
- Collection of surface water and sediment samples at HAA-01.
- Collection of groundwater samples at each site for constituents of concern identified during previous investigations to assess current groundwater conditions. Volatile organic compound (VOC) analysis will include speciation of xylenes. Where chromium has been detected in groundwater above screening criteria during the historical investigations, samples will be analyzed for complete speciation of chromium.
- Emerging contaminant 1,4-dioxane has not previously been sampled at any of the Sites. 1,4-Dioxane has historically been used as a stabilizing agent in 1,1,1-trichloroethane (1,1,1-TCA) based solvents and is most often encountered in locations where these materials were either routinely used or disposed. Due to the limited observation of 1,1,1-TCA or its associated degradation daughter products (1,1-dichloroethene or 1,1-dichloroethane) in groundwater, we anticipate that 1,4-dioxane will not be detected at the site. To evaluate the potential of 1,4-dioxane in groundwater, the JV proposed collecting one sample from the well with the highest VOC concentrations at each site. If 1,4-dioxane is not detected, no additional sampling will be conducted. If 1,4-dioxane is detected, additional samples will be collected to delineate the impacts in groundwater.
- Completion of a desktop VI evaluation in accordance with USEPA guidance at all of the sites as part of the RI/FS. VI modeling will be conducted to evaluate the potential for VI at each site. If a potential risk is identified, soil gas and/or sub-slab samples will be collected to further evaluate the potential risk.

The proposed scope for each Site is outlined in the following sections.

HAA-01 – Fire Training Site

Historical investigations at HAA-01 have sufficiently delineated impacts to the Site. The majority of the groundwater impacts identified were VOCs. Select areas also indicate semi-volatile organic compounds (SVOCs), metals, and pesticide impacts in groundwater. The most recent data are presented on **Figure 1** and **Figure 2**. The latest data is over 3 years old. The JV proposes collecting additional groundwater, surface water, and sediment samples to evaluate current conditions. Samples will be collected from existing shallow and deep groundwater monitoring wells and analyzed

for VOCs. Select samples will also be analyzed for SVOCs, pesticides, metals, and hexavalent chromium as shown in the table below. 1,4-Dioxane will be analyzed in the hottest well. If 1,4-dioxane is detected, additional samples will be collected to delineate groundwater impacts. Six surface water and sediment samples will be collected from the drainage canal west of the former fire training area and analyzed for VOCs, SVOCs, Resource Conservation Recovery Act metals, and hexavalent chromium.

Monitoring Wells and Sample Locations	Analytical Parameters
HA01-MW-09, HA01-MW-10, HA01-MW-11, HA01-MW-12, HA01-MW-12D, HA01-MW-13, HA01-MW-14, HA01-MW-14D, HA01-MW-14R, HA01-MW-15, HA01-MW-17, HMW-02, HMW-04, HMW-06, HMW-08, HMW-10, HWM-11, HMW-13, HWM-21, HMW-23, HWM-24, COE-MW-01, COE-MW-02, COE-MW-03, COE-MW-04, COE-MW-05, COE-MW-06, COE-MW-07, COE-MW-08, six surface water and sediment samples	USEPA Method 8260 (VOCs)
HMW-06, HMW-09, HMW-13, HMW-23, HMW-24, six surface water and sediment samples	USEPA Method 8270 (SVOCs),
COE-MW-03, COE-MW-04, COE-MW-05, COE-MW-06, COE-MW-08, HA01-MW-12, HA01-MW-13, HA01-MW-14, HA01-MW-15, HMW-21, six surface water and sediment samples	Metals and Hexavalent Chromium
HA01-MW-09, HA01-MW-14, COE-MW-01, COE-MW-02, HMW-14R	Pesticides
COE-MW-03	USEPA Method 8260 for 1,4-Dioxane

HAA-15 – MCA Barracks Site

Extensive investigations have been conducted at HAA-15 which identified chlorinated VOC impacts in groundwater. The majority of the impacts have been delineated. The most recent data for the shallow and deep intervals are presented in **Figure 3** and **Figure 4** respectively. The JV recommends replacing monitoring wells HGL-2B and HGL-2C to complete the downgradient delineation. Construction details of the proposed new monitoring wells are provided in the following table:

Monitoring Well ID	Purpose	Total Depth (ft)	Screened Interval (ft below ground surface [bgs])	Material/Casing Diameter (inch)
H15-MW-22B	Replace destroyed downgradient well	25	15-25	PVC / 2
H15-MW-22C	Replace destroyed downgradient well	45	35-45	PVC / 2

Samples will be collected from existing and new shallow and deep groundwater monitoring wells. The samples will be analyzed for VOCs by USEPA Method 8260B. 1,4-Dioxane will be analyzed in the monitoring well with the highest VOC concentrations. If 1,4-dioxane is detected, additional samples will be collected to delineate groundwater impacts.

The proposed monitoring wells to be sampled are provided in the following table:

Monitoring Wells	Analytical Parameters
Shallow	
HGL-1B, HGL-4B, HGL-5B, HGL-6B, HGL-7B, HGL-8B, HGL-9B, HGL-10B, HGL-11B, XX-12, XX-13, XX-15, XX-25, XX-26 (1-S), H15-MW-01B, H15-MW-02B, H15-MW-03B, H15-MW-05B, H15-MW-07B, H15-MW-09A, H15-MW-14B, H15-MW-15B, H15-MW-16B, H15-MW-17B, H15-MW-18B, H15-MW-19B, proposed New Well H15-MW-22B	USEPA Method 8260 (VOCs)
Deep	
HGL-1C, HGL-4C, HGL-5C, HGL-6C, HGL-7C, HGL-8C, HGL-9C, HGL-10C, HGL-11C, XX-17, XX-18, XX-19, XX-21, XX-26, H15-MW-01C, H15-MW-02C, H15-MW-03C, H15-MW-04C, H15-MW-05C, H15-MW-06C, H15-MW-07C, H15-MW-08C, H15-MW-09C, H15-MW-10C, H15-MW-11C, H15-MW-12C, H15-MW-13C, H15-MW-14C, H15-MW-15C, H15-MW-21C, H15-MW-02D, H15-MW-02E, H15-MW-20E, proposed New Well H15-MW-22C	USEPA Method 8260 (VOCs)
H15-MW-02C	USEPA Method 8260 for 1,4-Dioxane

HAA-17 – TCE Groundwater Contamination

Historical investigations at HAA-17 identified chlorinated VOC impacts in groundwater. The most recent data for the shallow and deep intervals are presented in **Figure 5** and **Figure 6** respectively. The majority of the impacts have been delineated. The JV recommends installing the following wells to finalize the remedial investigation.

- § Installation of a monitoring well side gradient of AF-71 to delineate deep zone.
- § Installation of a shallow zone well for vertical delineation in the area of AF-73.
- § Installation of a deep well near B159-1 to complete horizontal delineation.
- § Installation of a shallow well downgradient of AF-72 as a point of compliance well.

Construction details of the proposed new monitoring wells are provided in the following table:

Monitoring Well ID	Purpose	Total Depth (ft)	Screened Interval (ft bgs)	Material/Casing Diameter (inch)
H17-MW-30S	Downgradient of AF-72 as POC	17	7-17	PVC / 2
H17-MW-31S	Vertical delineation in area of AF-73	17	7-17	PVC / 2
H17-MW-32D	Vertical delineation side gradient of AF-71	45	35-45	PVC / 2
H17-MW-33D	Horizontal delineation near B159-1	45	35-45	PVC / 2

Samples will be collected from existing and new shallow and deep monitoring wells for analysis of VOCs by USEPA Method 8260B. Five samples will also be analyzed for hexavalent and total chromium. 1,4-Dioxane will be analyzed in the well with the highest VOC concentrations. If 1,4-dioxane is detected, additional samples will be collected to delineate groundwater impacts.

The proposed monitoring wells to be sampled are provided in the following table:

Monitoring Wells	Analytical Parameters
Shallow	
1290-MW-8S, 1290-MW-9S, 1290-MW-15S, 1290-MW-16S, AT-MW-2, AT-MW-3, AT-MW-4, AT-MW-5, AF-05, AF-07, AF-12, AF-13, AF-25, AF-26, AF-35, AF-58, AF-68, AF-70, AF-71, AF-72, H17-MW-19S, H17-MW-21S, H17-MW-22S, H17-MW-26S, H17-MW-27S, proposed new well H17-MW-30S, proposed new well H17-MW-31S	USEPA Method 8260 (VOCs)
AT-MW-2, AT-MW-3, AT-MW-4, AT-MW-5	Metals and Hexavalent Chromium
Deep	
1290-MW-8D, 1290-MW-9D, AT-MW-1, AF-22, AF-40, AF-41, AF-44, AF-53, AF-54, AF-55, AF-56, AF-60, AF-61, AF-68, AF-69, H17-MW-17D, H17-MW-20D, H17-MW-21D, H17-MW-22D, H17-MW-23D, H17-MW-24, H17-MW-25D, H17-MW-26D, H17-MW-27D, H17-MW-29D, proposed new well H17-MW-32D, proposed new well H17-MW-33D	USEPA Method 8260 (VOCs)
AT-MW-1	Metals and Hexavalent Chromium
AF-53	USEPA Method 8260 for 1,4-Dioxane

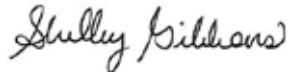
The supplemental investigation is tentatively scheduled for Fall 2014 pending Georgia Environmental Protection Division (GAEPD) approval. All of the field activities and data collected will be in accordance with the PIKA-ARCADIS JV Quality Assurance Project Plan submitted to GAEPD for review in June 2014. Following

completion of the supplemental investigation, a CERCLA RI/FS report will be prepared for each site to summarize the new and historical data, and evaluate potential remedial options.

Should you have any questions regarding the proposed supplemental investigation activities, please contact us at your convenience at (919) 415-2256.

Sincerely,

ARCADIS US, Inc.



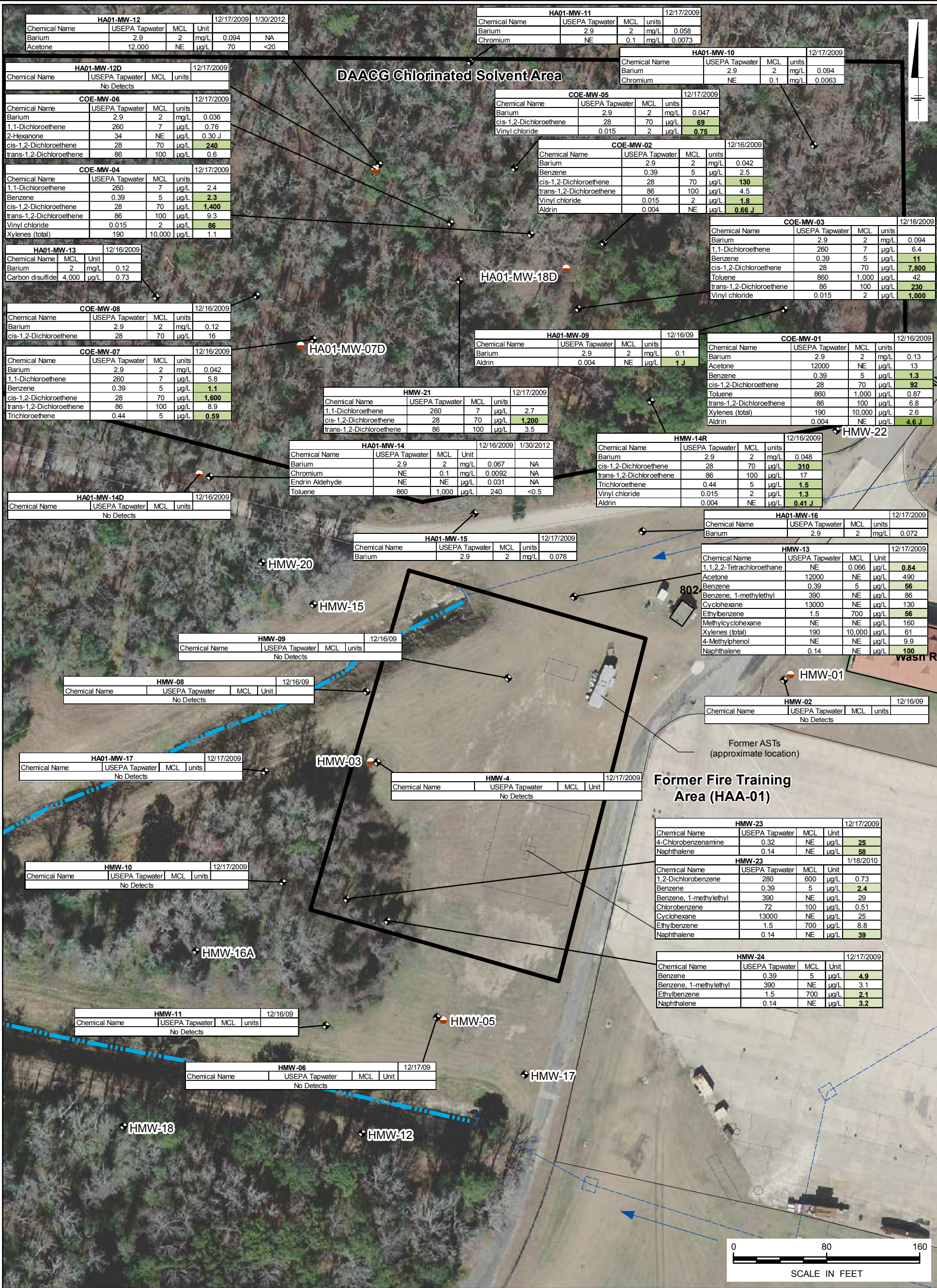
Shelley Gibbons
Project Manager

Copies:

Ms. Amy Potter, GAEPD (2 hard copies, 1 electronic)
Mr. Zsolt Haverland, USACE (1 hard copy, 1 electronic copy)
Mr. Paul Higgs, USAEC (1 electronic copy)
File

Figures:

- Figure 1: Fire Training Area, Groundwater Summary (2008-2012)
- Figure 2: Summary of cis-1,2-Dichloroethene Concentrations in Groundwater (December 2009 through February 2012)
- Figure 3: Shallow Zone of Upper Aquifer (0-30 ft bgs), Volatile Organic Compounds in Groundwater Monitor Wells
- Figure 4: Deep Zone of Upper Aquifer (30-50 ft bgs), Volatile Organic Compounds in Groundwater Monitor Wells
- Figure 5: Shallow Zone TCE Isoconcentration Contours and Concentrations of VOCs Detected in Former UST 25 and 26 Area Groundwater Monitoring Wells from 2008 to Present
- Figure 6: Deep Zone TCE Isoconcentration Contours and Concentrations of VOCs Detected in Former UST 25 and 26 Area Groundwater Monitoring Wells from 2008 to Present



PROJECTION: NAD83 StatePlane Georgia East Feet
AERIAL SOURCE: SAGIS (2008).

LEGEND

- Storm Water Drainage Canal
- Storm Water Drainage System
- Drainage Flow Direction
- Monitor Well (shallow)
- Monitor Well (deep)

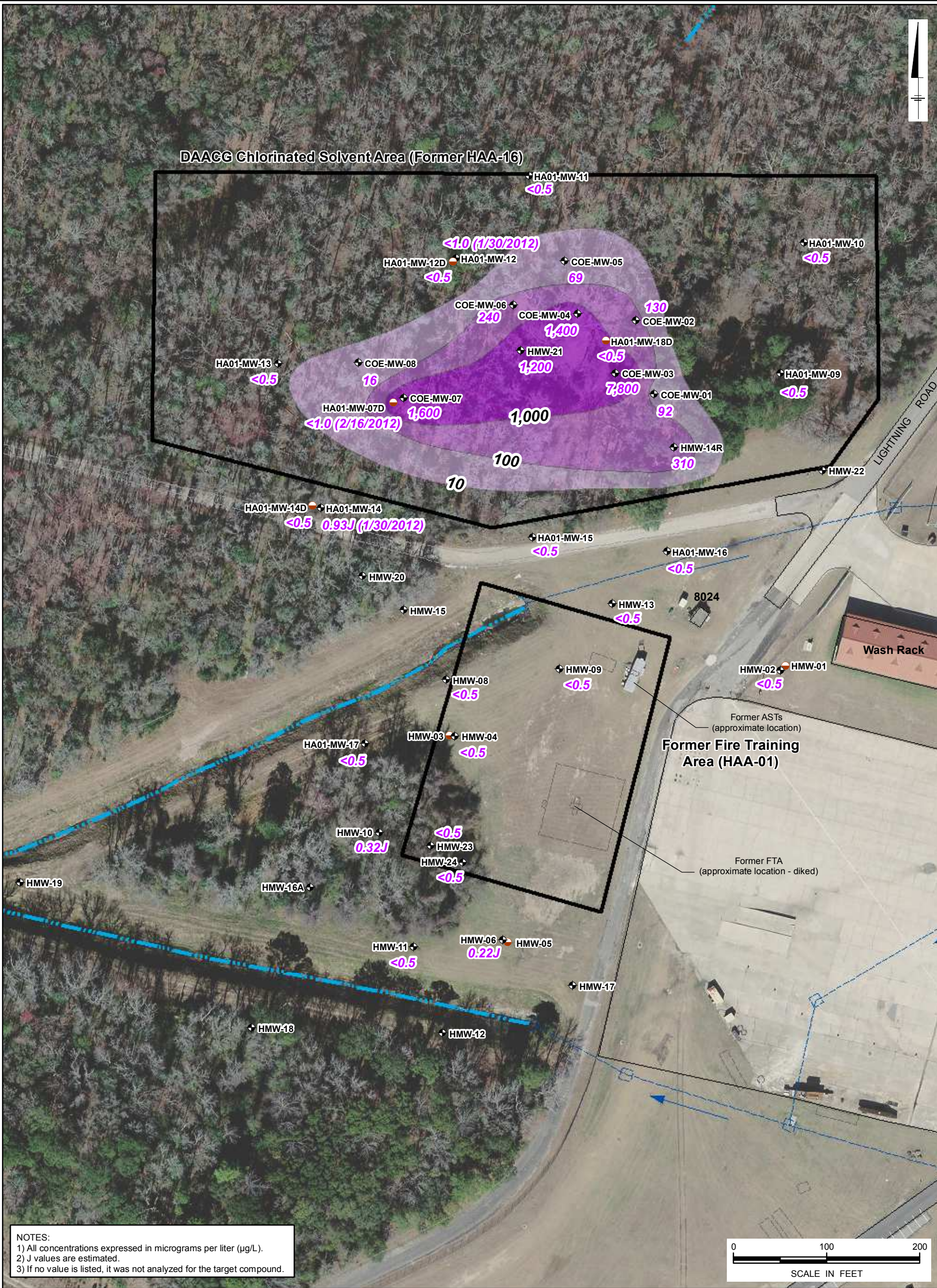
- NOTES:**
- All concentrations expressed in micrograms per liter (µg/L) unless noted otherwise, milligrams per liter (mg/L).
 - Shaded values represent those values that exceed the Maximum Contaminant Level (MCL) or USEPA Tapwater Standard.
 - J values are estimated.
 - If no value is listed, it was not analyzed for the target compound.
 - NE - Standard has not been established.

HUNTER ARMY AIRFIELD, GEORGIA (HAA-01)

**Fire Training Area
Groundwater Summary (2008-2012)**



FIGURE
1



PROJECTION: NAD83 StatePlane Georgia East Feet
AERIAL SOURCE: SAGIS (2008).

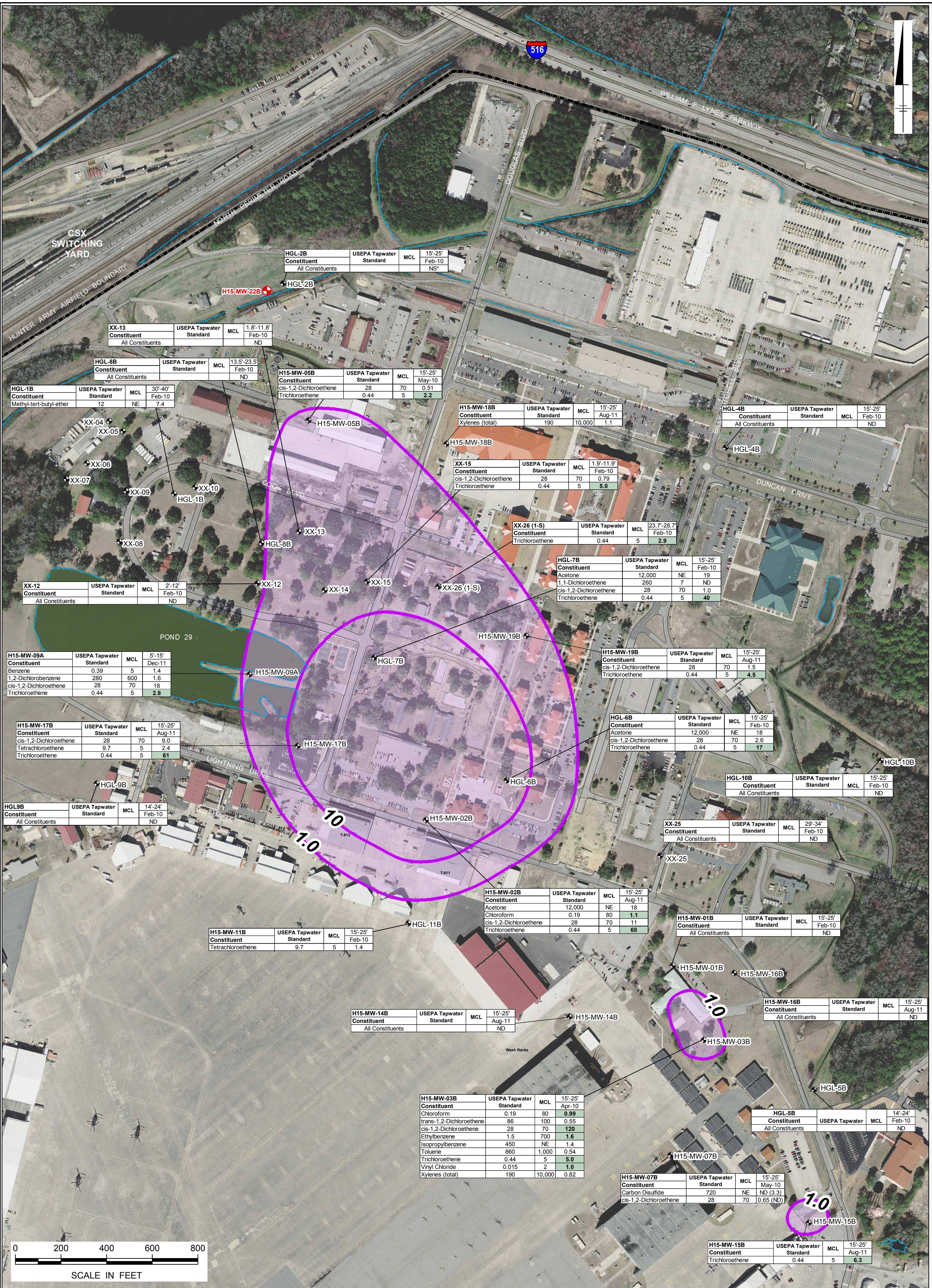
HUNTER ARMY AIRFIELD, GEORGIA (HAA-01)

Summary of cis-1,2-Dichloroethene
Concentrations in Groundwater
(December 2009 through February 2012)

FIGURE
2

LEGEND

- Storm Water Drainage Canal
- Storm Water Drainage System
- Drainage Flow Direction
- Monitor Well (shallow)
- Monitor Well (deep)
- cis-1,2-Dichloroethene Isocontour 10 (µg/L)
- cis-1,2-Dichloroethene Isocontour 100 (µg/L)
- cis-1,2-Dichloroethene Isocontour 1,000 (µg/L)



PROJECTION: NAD_1983_StatePlane_Georgia_East_FIPS_1001_Feet
REFERENCE: SAGIS (2008).

LEGEND

-  Monitor Well (shallow)
 Proposed Monitor Well (shallow)
 TCE Isoconcentration Contour (µg/L)
 (3.3) Duplicate Data
 ND Not Detected

NOTES:

- NOTES:
- 1) All concentrations expressed in micrograms per liter (µg/L).
 - 2) Shaded values represent those values that exceed the Maximum Contaminant Level (MCL) or USEPA Tapwater Standard.
 - 3) J values are estimated.
 - 4) B values indicate the analyte was detected in the method blank sample.
 - 5) ND – Not detected
 - 6) -- - Not Sampled
 - 7) NS* - Well was destroyed in late 2009.
 - 8)) The shallow zone of the upper aquifer consists of wells with screened intervals between ground surface and 30 ft bgs.

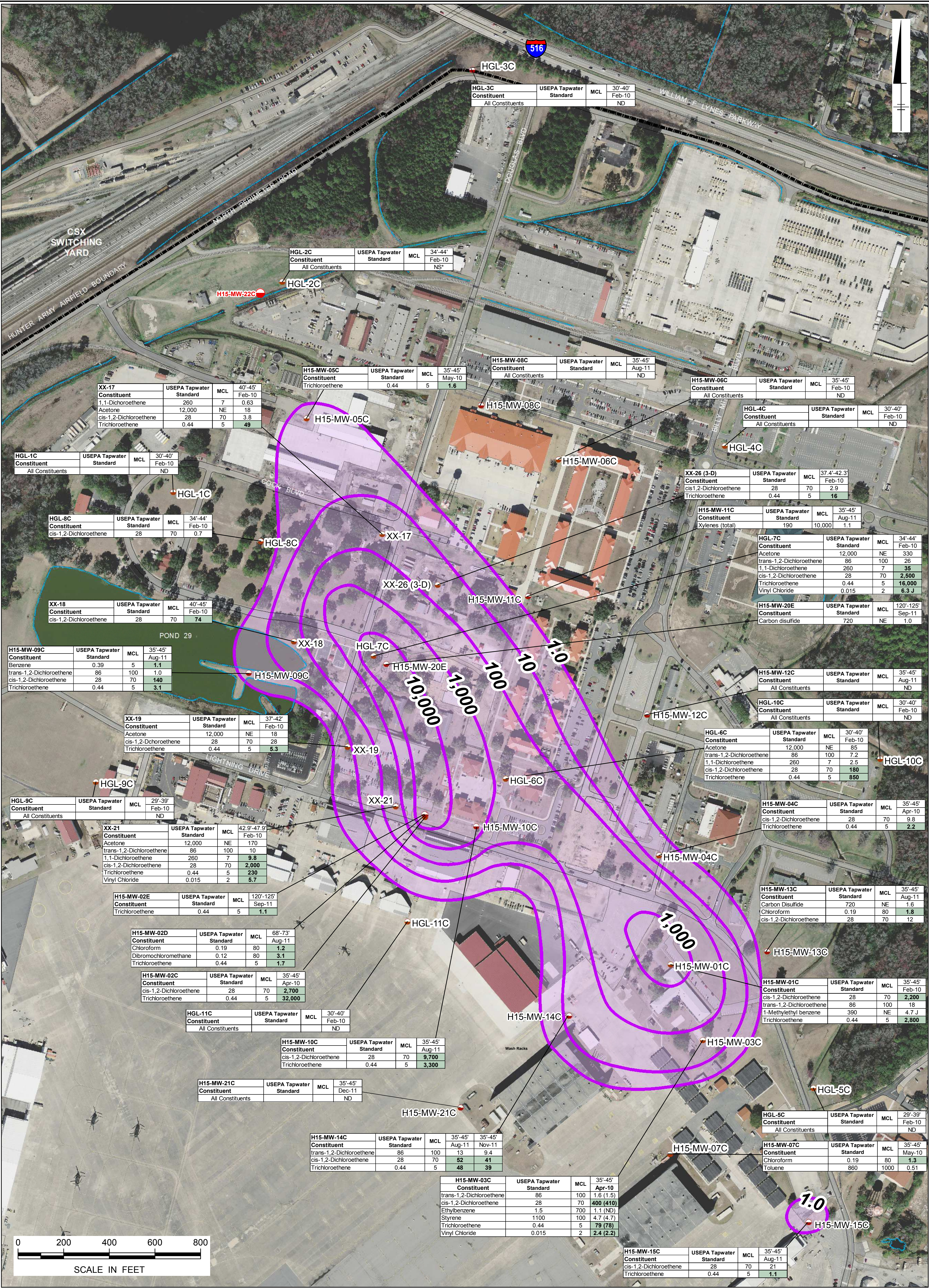
HUNTER ARMY AIRFIELD, GEORGIA (HAA-15)

Shallow Zone of Upper Aquifer (0 - 30 ft bgs) Volatile Organic Compounds in Groundwater Monitor Wells



FIGURE

3



PROJECTION: NAD_1983_StatePlane_Georgia_East_FIPS_1001_Feet
REFERENCE: SAGIS (2008).

LEGEND

- Monitor Well (deep)
- TCE Isoconcentration Contour (µg/L)
- Proposed Monitor Well (deep)
- (4.7) Duplicate Data
- ND Not Detected

NOTES:

- 1) All concentrations expressed in micrograms per liter (µg/L).
- 2) Shaded values represent those values that exceed the Maximum Contaminant Level (MCL) or USEPA Tapwater Standard.
- 3) H15-MW-02D, H15-MW-02E, and H15-MW-20E were not used for contouring.
- 4) J values are estimated.
- 5) B values indicate the analyte was detected in the method blank sample.
- 6) ND – Not Detected
- 7) - - Not Sampled
- 8) NS* - Well was destroyed in late 2009.
- 9) The deep zone of the upper aquifer consists of wells with screened intervals between 30 and 50 ft bgs.

HUNTER ARMY AIRFIELD, GEORGIA (HAA-15)

Deep Zone of Upper Aquifer (30 - 50 ft bgs)
Volatile Organic Compounds
in Groundwater Monitor Wells



CITY:(KNOXVILLE) DIV:(GROUP:(ENV/GIS) LD:(BALTOM) PIC:(B:TEMLPIN) PM:(S:GIBBONS) TM:(S:BOSTIAN) PROJECT: 10153001.0001
PATH: G:\GIS\HAAF_PIKAMAPDOC\SHAAF_SW2014\KICK-OFF\MTG\F5 SW_H17 GW HIST VOCs S DSIZE.MXD SAVED: 6/17/2014 BY: BALTOM

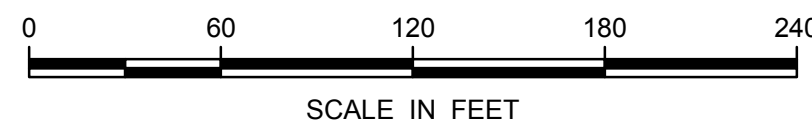
LEGEND

- Storm Water Drainage Canal
- Monitor Well (shallow)
- Proposed Monitor Well (shallow)
- Extent of TCE Impact

NOTES:

- 1) All concentrations are reported in micrograms per liter (µg/L).
- 2) Shaded values represent those values that exceed the Maximum Contaminant Level (MCL) or USEPA Tapwater Standard.
- 3) J values are estimated.
- 4) NE - Not established.
- 5) ND - Not detected
- 6) Wells with screened intervals predominantly below 25 feet below ground surface are included in the deep zone for isoconcentration contour purposes. Other wells are included in the shallow zone.

PROJECTION: NAD83 State Plane Georgia East
REFERENCE: SAGIS (2008).



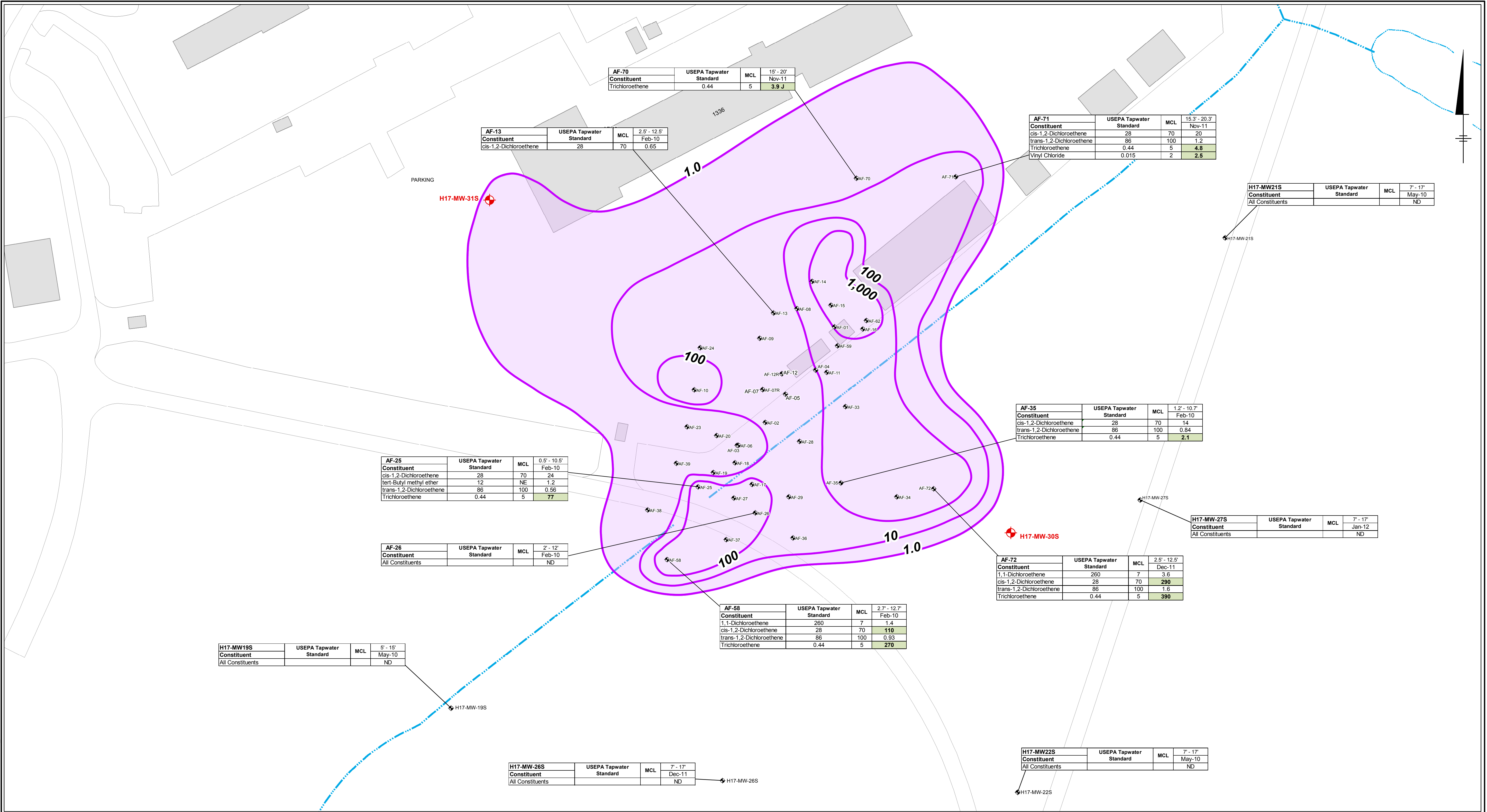
HUNTER ARMY AIRFIELD, GEORGIA (HAA-17)

**Shallow Zone TCE Isoconcentration Contours
and Concentrations of VOCs Detected in
Former UST 25 and 26 Area Groundwater
Monitoring Wells from 2008 to Present**



FIGURE

5

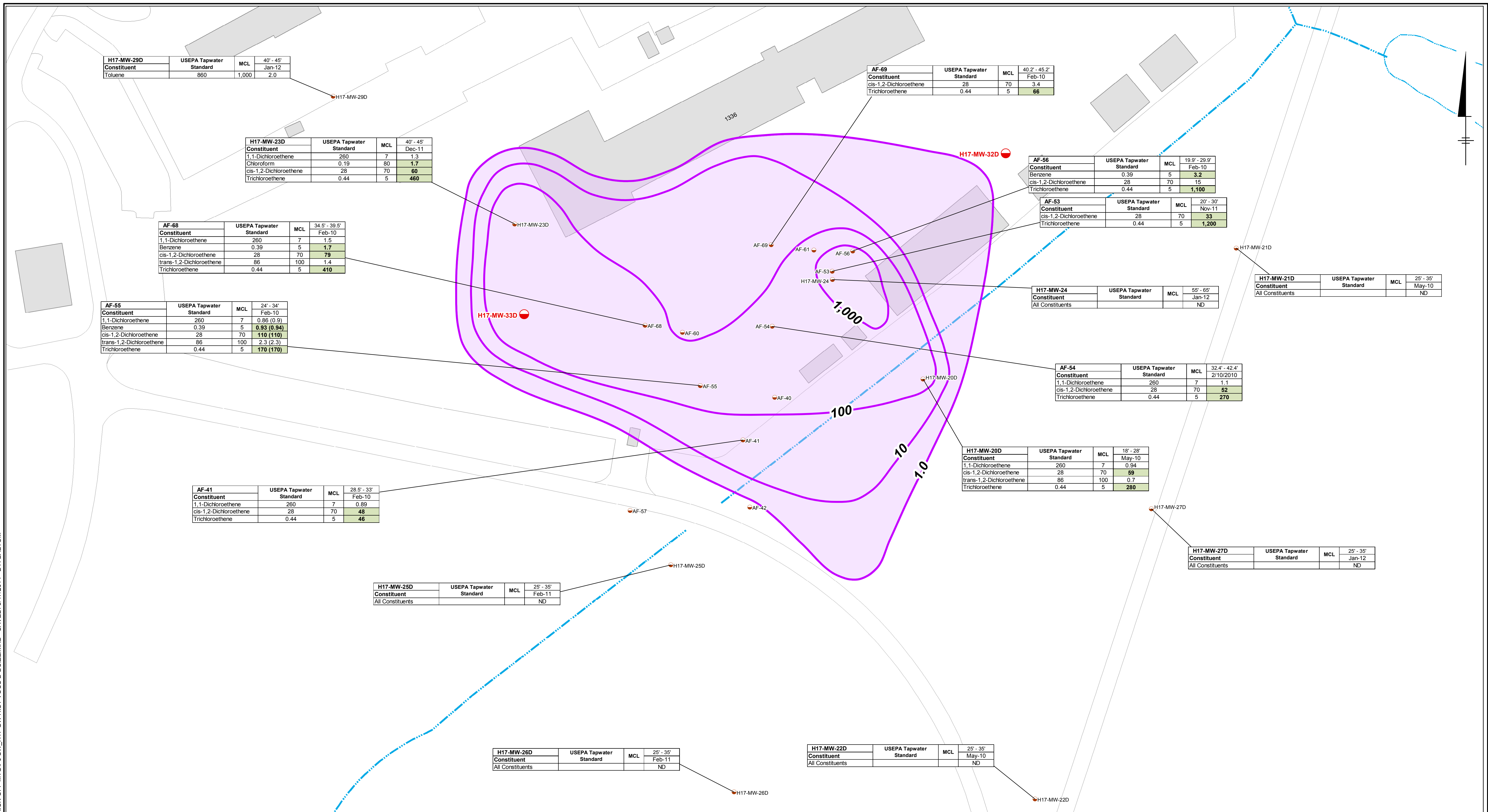


LEGEND

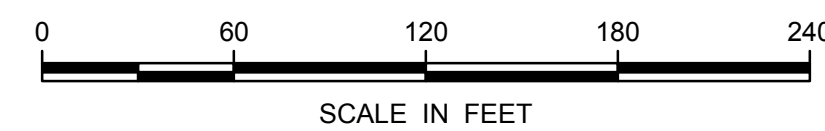
-  Storm Water Drainage Canal
-  Monitor Well (deep)
-  Proposed Monitor Well (deep)
-  Extent of TCE Impact

NOTES:

- 1) All concentrations are reported in micrograms per liter (µg/L).
- 2) Shaded values represent those values that exceed the Maximum Contaminant Level (MCL) or USEPA Tapwater Standard.
- 3) J values are estimated.
- 4) ND - Not detected
- 5) Wells with screened intervals predominantly below 25 feet below ground surface are included in the deep zone for isoconcentration contour purposes. Other wells are included in the shallow zone.



PROJECTION: NAD83 State Plane Georgia East
REFERENCE: SAGIS (2008).



HUNTER ARMY AIRFIELD, GEORGIA (HAA-17)

Deep Zone TCE Isoconcentration Contours and Concentrations of VOCs Detected in Former UST 25 and 26 Area Groundwater Monitoring Wells from 2008 to Present



FIGURE

6