March 14, 2014

Jennifer Lapoma
Remediation Project Manager
Western New York Remediation Section
United States Environmental Protection Agency (US EPA)
209 Broadway, 20th Floor
New York, NY 10007-1866

Re: Upgradient Plume Impact on NCIA and OU1
New Cassel Hicksville Contaminated Groundwater Site

Dear Ms. Lapoma:

Thank you for meeting with us on March 12, 2014. We found the meeting useful and we appreciate US EPA's time. This letter presents the lines of evidence that were presented and discussed at the meeting regarding the migration of the Upgradient Plume into both the New Cassel Industrial Area (NCIA) and Operable Unit 1 (OU1). The Upgradient Plume results primarily from multiple source areas at two industrial facilities, Sylvania and GI/Vishay, located northeast of the NCIA (Figure 1). Environmental investigations have been undertaken at these Sites since the 1980s.[1] Historical chlorinated solvent usage at both sites was similar to the industrial facilities located within the NCIA. Elevated tetrachloroethylene (PCE) and/or trichloroethylene (TCE) concentrations in groundwater, consistent with the presence of non-aqueous phase liquid (NAPL), have been found at the Sylvania and GI/Vishay Sites. PCE concentrations up to 32,000 µg/L (P-108, 74 ft-bgs[1]) have been detected at the Sylvania facility, and TCE has been detected at concentrations up to 48,000 µg/L (W-1-75, 65-75 ft-bgs[2]) at the GI/Vishay facility. While multiple chlorinated solvents have been identified, the Upgradient Plume generally has a TCE fingerprint (*i.e.* enriched in TCE relative to PCE).[1]

The chlorinated VOC plume from the Upgradient Parties migrates in a southwesterly direction into the NCIA and OU1. The conclusion that the Upgradient Plume has entered and is affecting groundwater quality in the NCIA and OU1 is supported by multiple lines of evidence, summarized below:

- The Upgradient Plume is visible at depth profile sampling locations installed by GI/Vishay upgradient of the Eastern Plume, within the NCIA, and within OU1[3] (Figure 2). Moreover, the Upgradient Plume is discernible based on depth and chemical fingerprint from the Eastern Plume. Data from specific depth profile locations are discussed below.
    - LP-Vishay-3 is located upgradient of the Frost St. sites in the Eastern portion of the NCIA (Figure 2). As such, impacts observed at this location can only be a result of the Upgradient Plume and cannot be caused by any NCIA-related source or the degradation of any NCIA-related source. The depth profile indicates elevated concentrations of PCE and TCE between depths of approximately 210 and 400 ft-below ground surface (bgs) (Figure 3). The plume at this location is enriched in TCE relative to PCE, consistent with the Upgradient Plume chemical signature.

[1] Bolduc, J. 2013. Letter Report to J. Cantanzarita (USEPA) re: Supplemental Remedial Investigation Technical Memorandum, New Cassel/Hicksville Ground Water Contamination Site, Nassau County, New York. 222p., July 19. [R2-0011894 - R2-0012115.]
[2] ESC Engineering of New York, P.C. (ESC). 2006. "May 2006 Semiannual Groundwater Monitoring Report, Former General Instrument Corporation Site, Hicksville, New York." 133p., August 23. [SDOH252658 - SDOH252789.]

- WP-01 is located on the edge of the NCIA, side-gradient from the Frost St. sites (Figure 2). The concentration depth profile is similar to LP-Vishay-3. Elevated concentrations of PCE and TCE between depths of approximately 190 and 400 ft-bgs (Figure 4). The chemical fingerprint of the plume is also enriched in TCE relative to PCE, a signature of the Upgradient Plume.
- WP-07 is located near the source area at the Frost St. sites (Figure 2). This concentration depth profile indicates the presence of two separate and distinct plumes. A shallow plume is apparent between 50 and 100 ft-bgs (Figure 5). This plume, which has a PCE fingerprint (*i.e.* PCE enriched relative to TCE), is associated with the Frost St. sites. At the same location, a distinct and separate deeper plume is visible. The deep plume, associated with the Upgradient Parties, is located at depths ranging from approximately 200 to 430 ft-bgs (Figure 5); consistent with the Upgradient Plume, it is enriched in TCE relative to PCE.
- WP-06 is located farther downgradient in OU1 (Figure 2). The depth profile at this location indicates that both the Eastern Plume (*e.g.* Frost St. plume) and the Upgradient Plume have migrated vertically downward. The PCE-enriched Eastern Plume is located at a depth interval of approximately 220 to 280 ft-bgs, while the TCE-enriched Upgradient Plume is located at a depth interval of approximately 300 to 480 ft-bgs (Figure 6).

- 1,2-Dichlorobenzene (1,2-DCB) is a distinct marker of the Upgradient Plume, uniquely associated with the GI/Vishay facility,[3] and is found within the NCIA. GI/Vishay acknowledged that 1,2-DCB was a unique marker of their operations and used this compound to delineate the migration direction of their VOC plume.[3] Groundwater quality data collected as part of this investigation found a 1,2-DCB plume migrating into both the NCIA and OU1 (Figure 7). Furthermore, elevated levels of PCE and/or TCE (associated with the Upgradient Plume) were co-located with 1,2-DCB, just upgradient of the NCIA, although the PCE and TCE associated with the Upgradient Plume have migrated much farther and into OU1 due to the faster migration rates of these compounds compared to 1,2-DCB – as acknowledged by GI/Vishay's consultant.[3]
- Groundwater and contaminant transport modeling undertaken by GI/Vishay demonstrates that the Upgradient Plume is migrating into the NCIA and OU1. GI/Vishay used the measured concentrations for 1,2-DCB, a GI/Vishay marker compound, to first delineate the fate of their plume and calibrate a contaminant transport model, which was then used to estimate the downgradient extent of the PCE and TCE plumes associated with **just** the GI/Vishay facility.[3] Note, the model-estimated plume extents were to be used to guide the placement of future monitoring wells to further delineate the down-gradient extents of the plume – an effort that was abandoned once the New York State Department of Environmental Conservation (NYSDEC) decided to refer the groundwater contamination sites in this area to the USEPA for potential placement on the National Priorities List. Regardless, the GI/Vishay model-predicted plumes for PCE and TCE, attributable **just to the GI/Vishay sources** extend up to 1,600 feet into OU1 (Figures 8 and 9).

Compiling all data collected by GI/Vishay during their model calibration, with all existing data presents compelling evidence that the Upgradient Plumes impact groundwater quality in both the NCIA and OU1 (Figure 10). The Upgradient plume, containing TCE concentrations in excess of 1,000 µg/L, enters OU1 at a depths ranging from 200 to 420 ft-bgs (Figure 10). Furthermore, impacts associated with the Upgradient plume in the NCIA and OU1 are discernible from the Eastern Plume based on both depth and

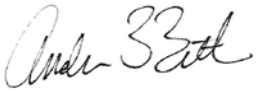
[3] WSP Engineering of New York, P.C. (WSP). 2010. "Interim Phase VI Remedial Investigation Report and Supplemental Work Plan, Former General Instrument Corporation Site, Hicksville, NY." 190p., May 21. [ALBEM00165137 - ALBEM00165326.]

chemical signature (Figures 11 and 12). These lines of evidence, combined with the presence of a unique marker compound (1,2-DCB) in groundwater uniquely associated with one of the Upgradient Parties and a groundwater solute transport model demonstrating the migration of chlorinated solvents from the upgradient parties into OU1, demonstrate conclusively that the Upgradient Plume impacts groundwater quality within the NCIA and OU1.

We greatly appreciate your attention to this matter. Please feel free to contact us if you need any additional information.

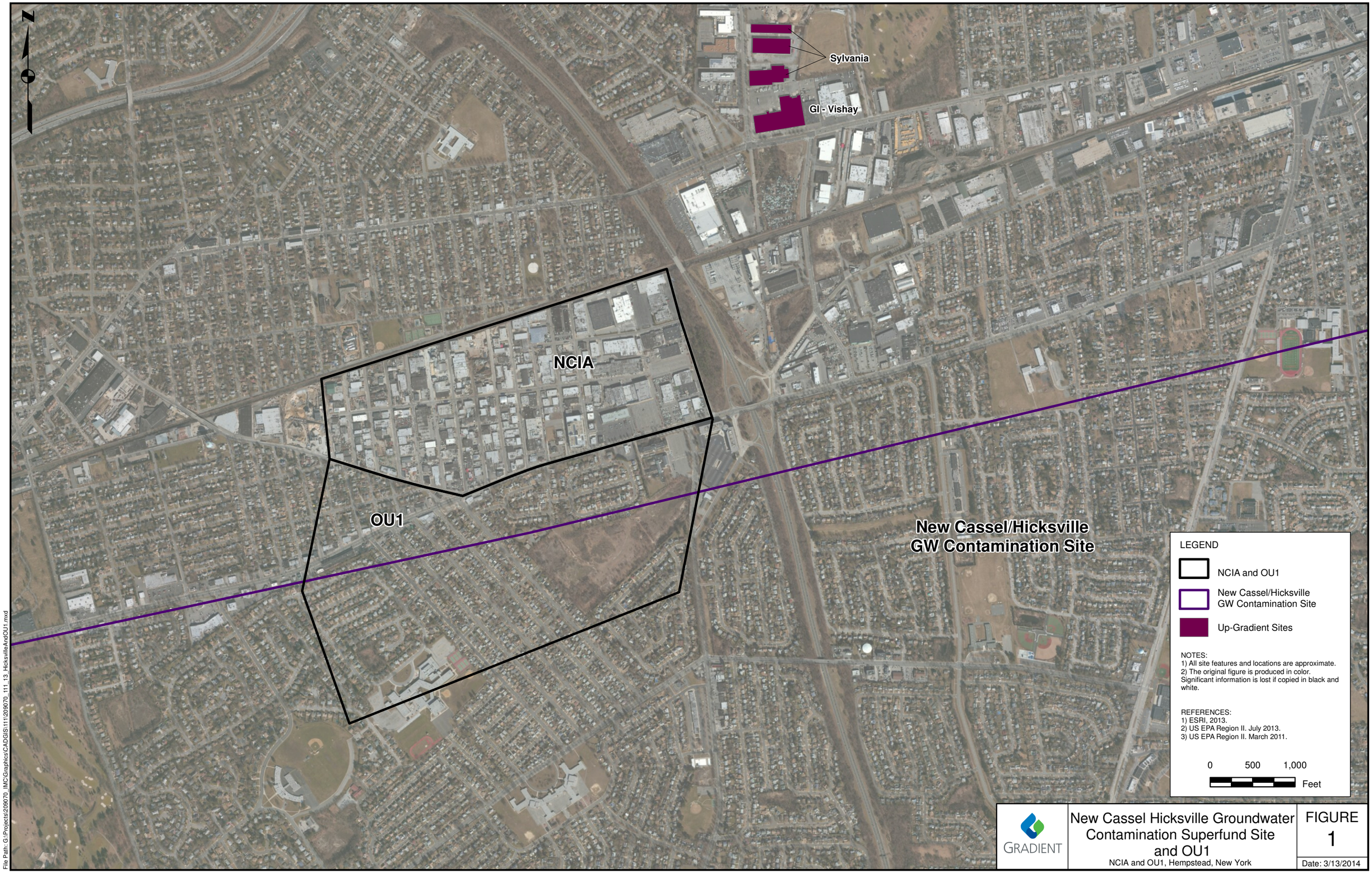
Sincerely,

GRADIENT



Andrew Bittner, P.E.
Principal Scientist

Manu Sharma, P.E.
Principal



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New Cassel Hicksville Groundwater Contamination Superfund Site and OU1

NCIA and OU1, Hempstead, New York

FIGURE 1

Date: 3/13/2014

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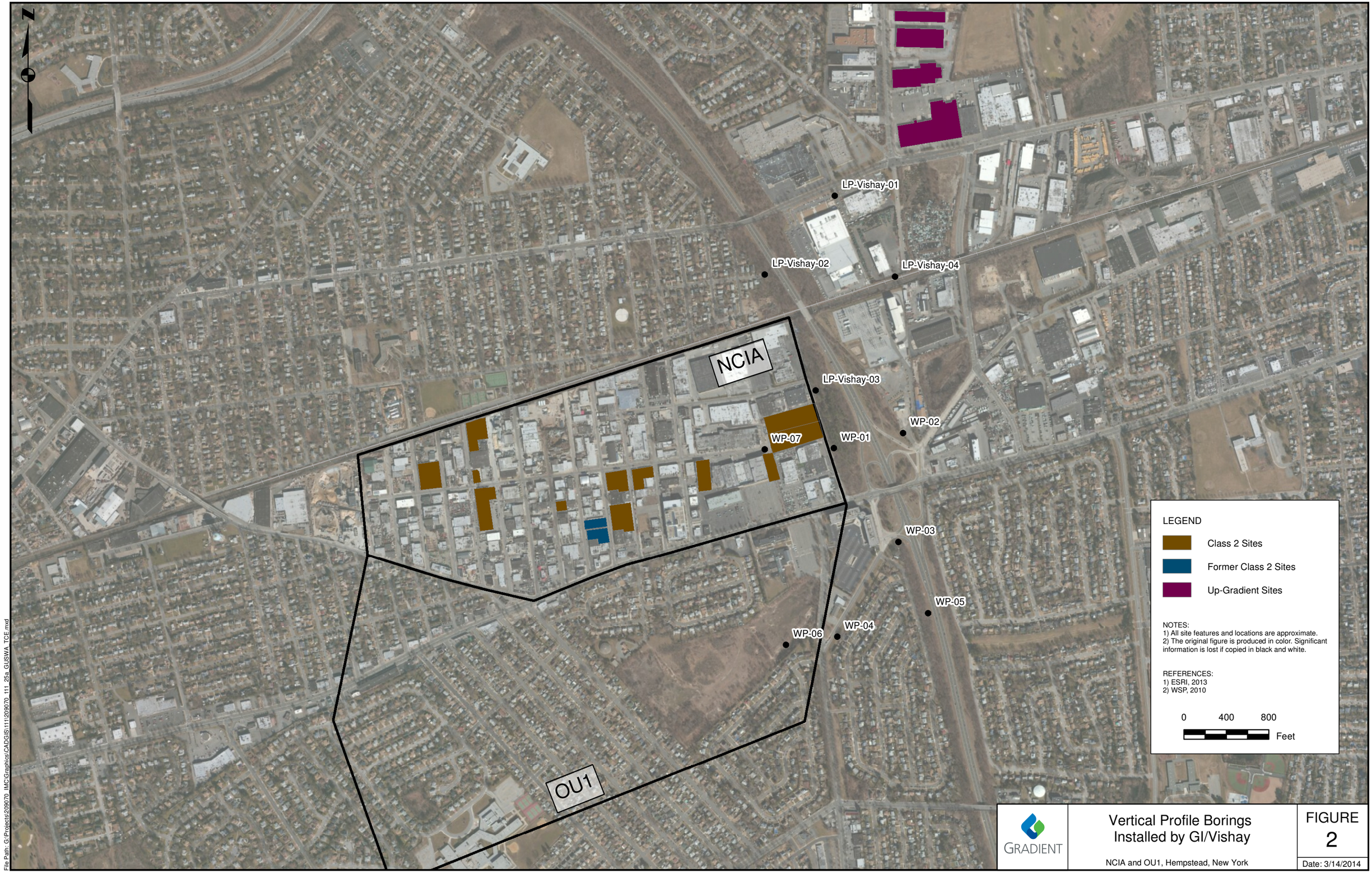

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Vertical Profile Borings Installed by GI/Vishay

NCIA and OU1, Hempstead, New York

FIGURE 2

Date: 3/14/2014

File Path: G:\Projects\209070_IMC\Graphics\CAD\GIS\111\209070_111_25a_GUSWA_TCE.mxd

Figure 3
LP-Vishay -03 (Edge of NCIA Eastern Boundary and Upgradient of Frost Street Sites)
NCIA and OU1, Hempstead, New York

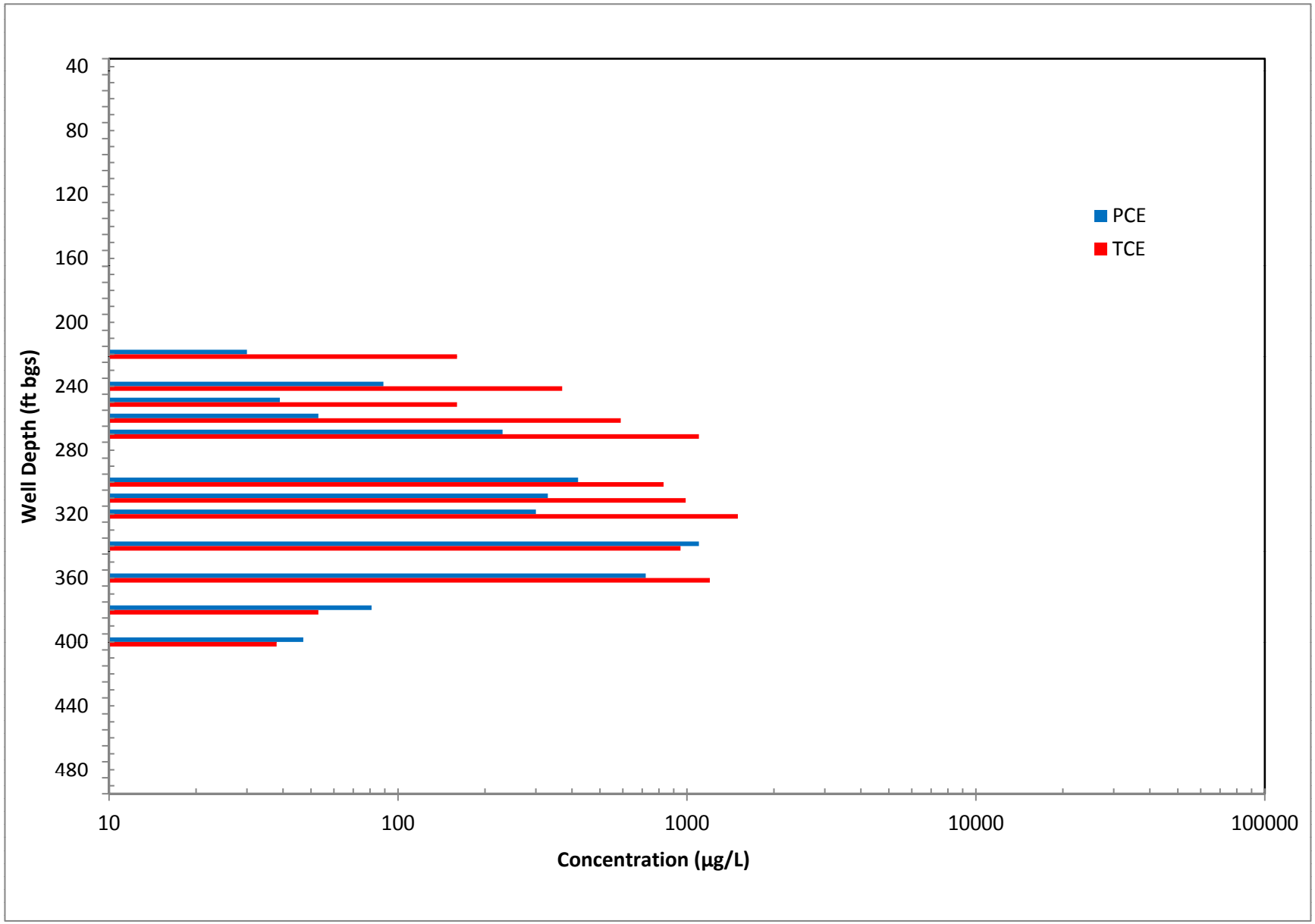


Figure 4
WP-01 (Edge of NCIA Eastern Boundary)
NCIA and OU1, Hempstead, New York

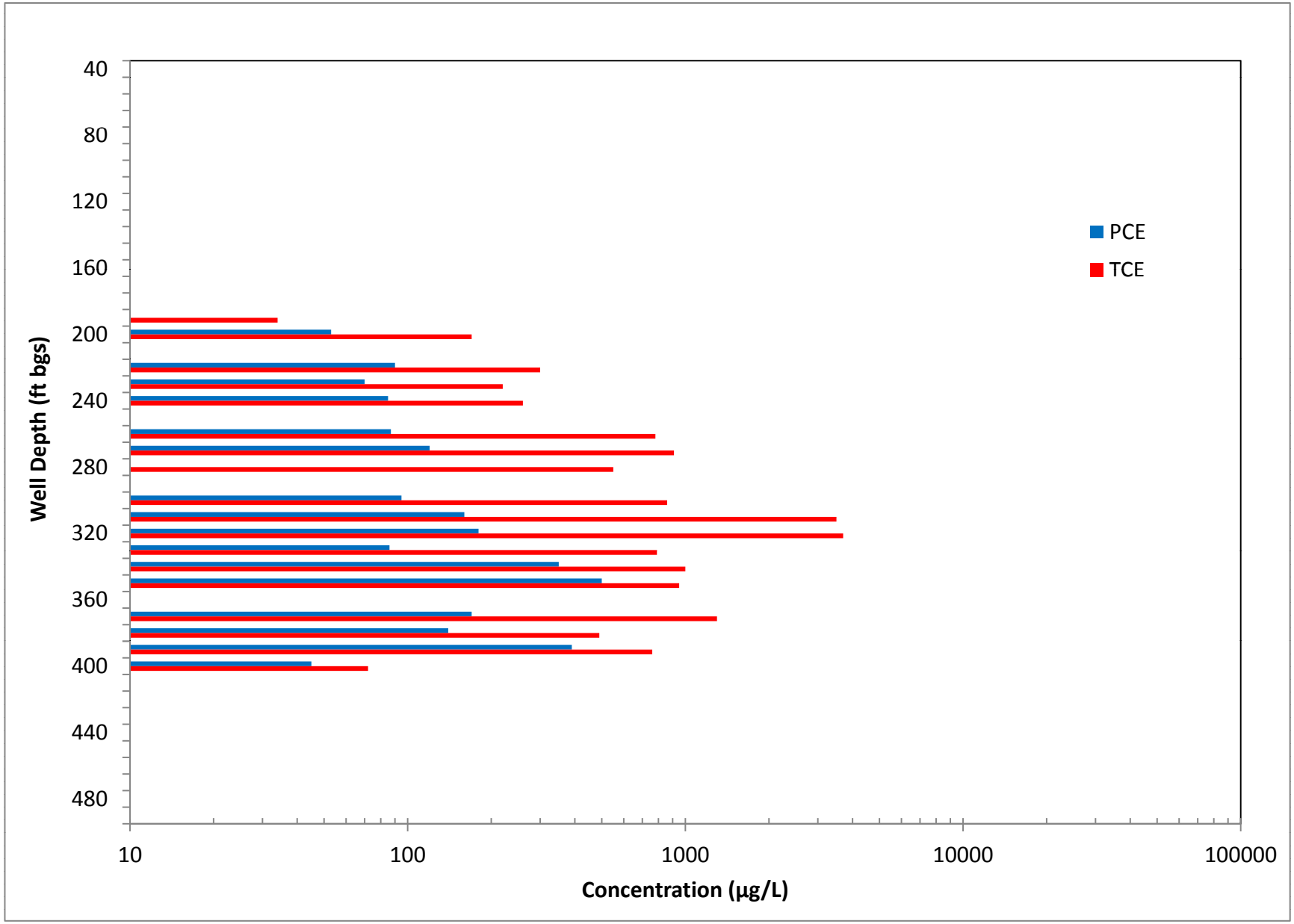


Figure 5
WP-07 (in Eastern NCIA)
NCIA and OU1, Hempstead, New York

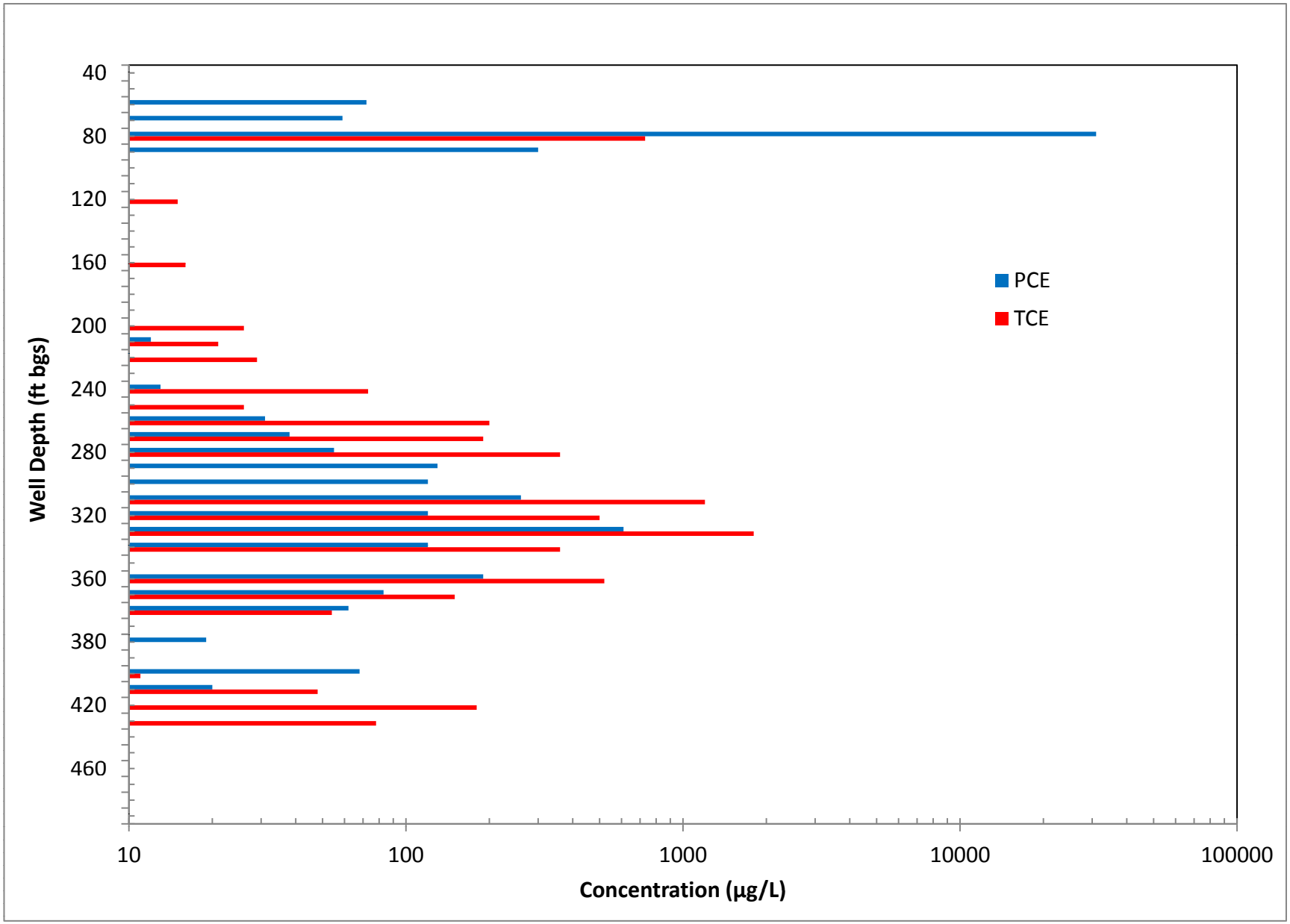
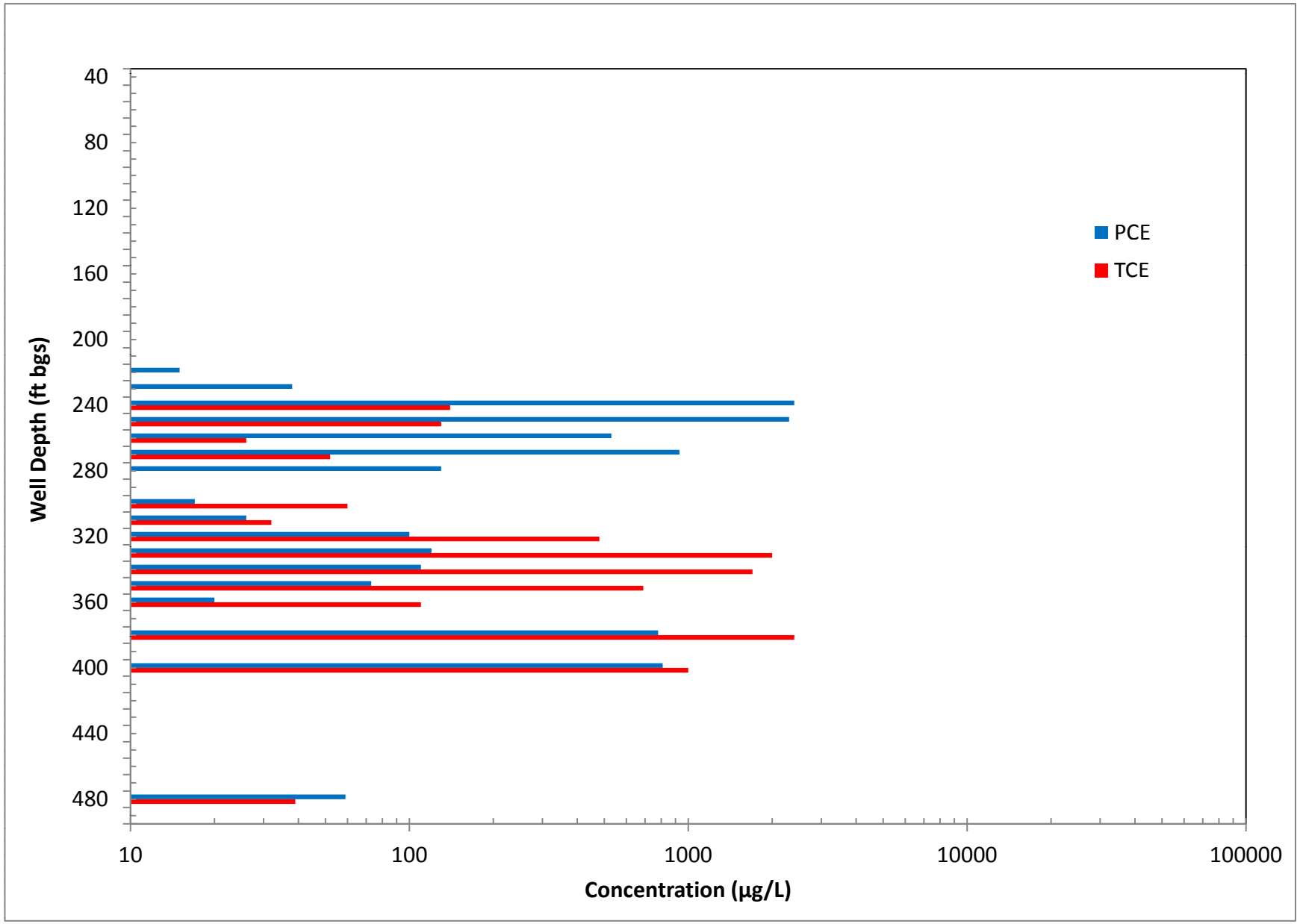


Figure 6
WP-06 (in OU-1)
NCIA and OU1, Hempstead, New York



LEGEND

1,2-DICHLOROBENZENE PLUME BOUND AT 25 ug/L (DASHED WHERE INFERRED)

SOURCE:
Supplemental RI (Bolduc, 2013; Figure B-5).

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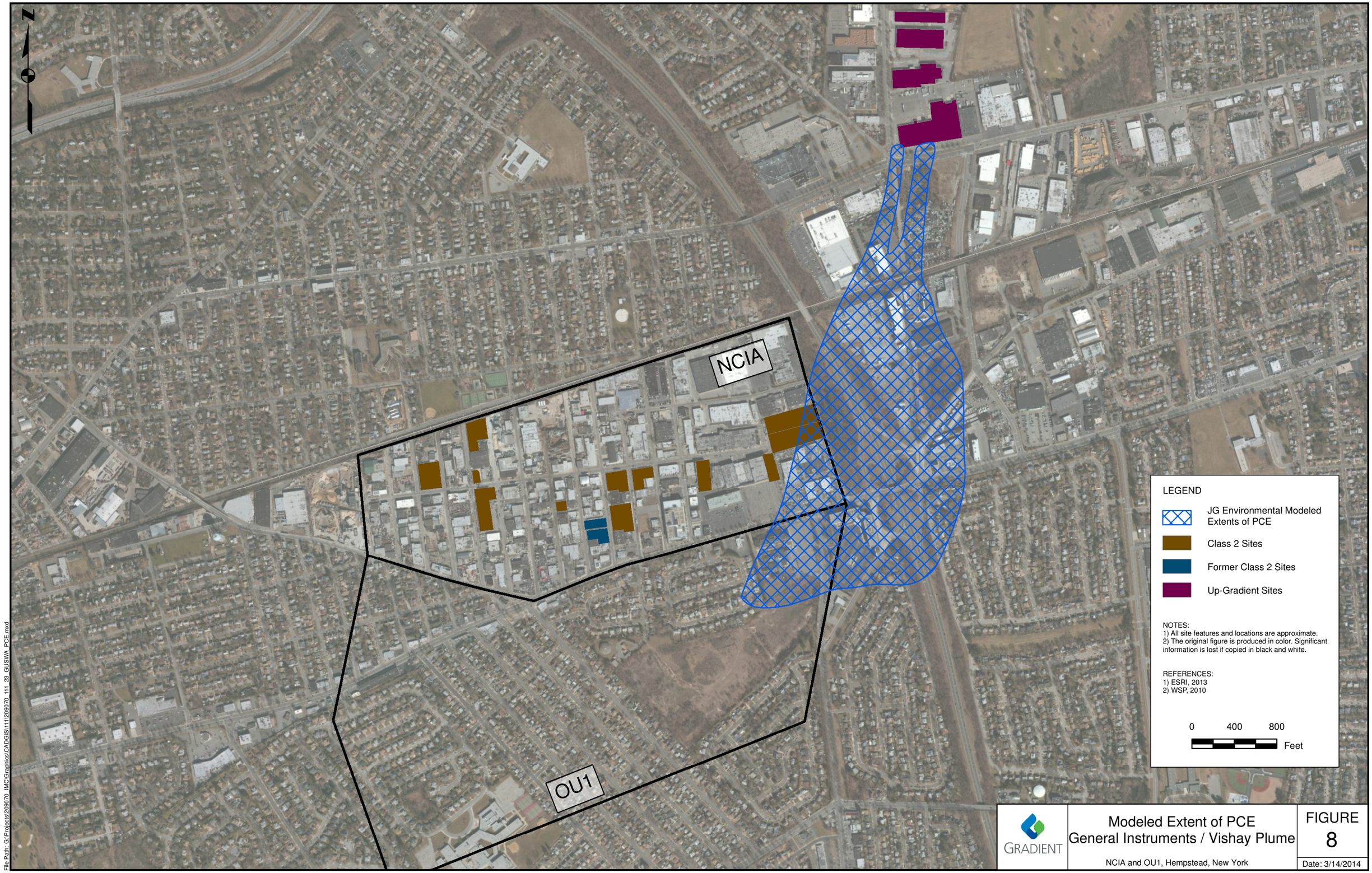
Extent of 1,2 Dichlorobenzene Measured in Groundwater

NCIA and OU1, Hempstead, New York

FIGURE 7

Date: 3/14/2014

File Path: G:\Projects\209070_IMC\Graphics\NonCAD\PCEandTCEprediction\PlumeFrpmGlvishaya.ai



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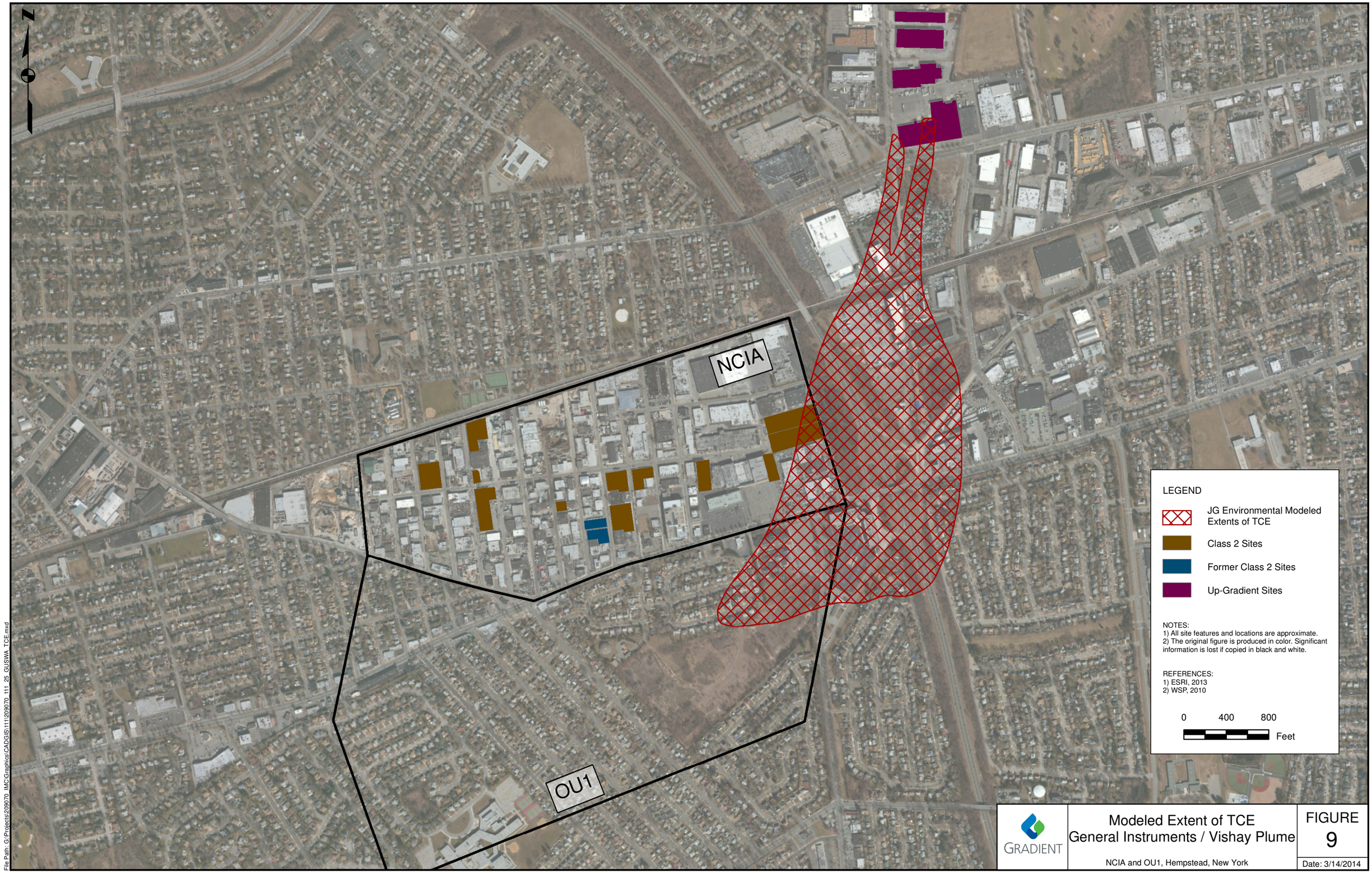
Modeled Extent of PCE
General Instruments / Vishay Plume

NCIA and OU1, Hempstead, New York

FIGURE
8

Date: 3/14/2014

File Path: G:\Projects\209070_IMC\Graphics\CADGIS\111\209070_111_23_GUSWA_PCE.mxd



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Modeled Extent of TCE
General Instruments / Vishay Plume

NCIA and OU1, Hempstead, New York

FIGURE
9

Date: 3/14/2014

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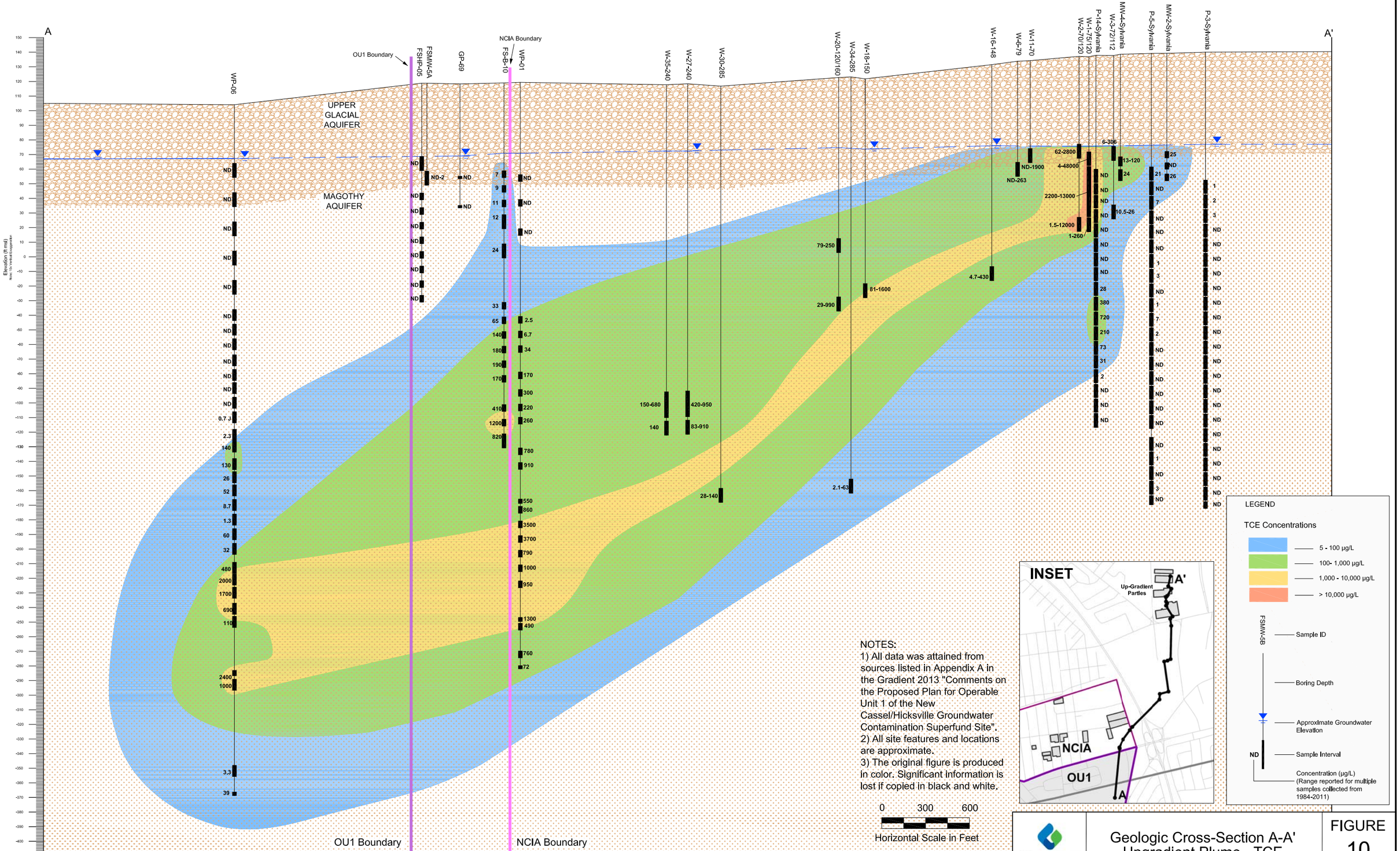

NOTES:
1) All data was attained from sources listed in Appendix A in the Gradient 2013 "Comments on the Proposed Plan for Operable Unit 1 of the New Cassel/Hicksville Groundwater Contamination Superfund Site".
2) All site features and locations are approximate.
3) The original figure is produced in color. Significant information is lost if copied in black and white.

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Geologic Cross-Section A-A'
Upgradient Plume - TCE

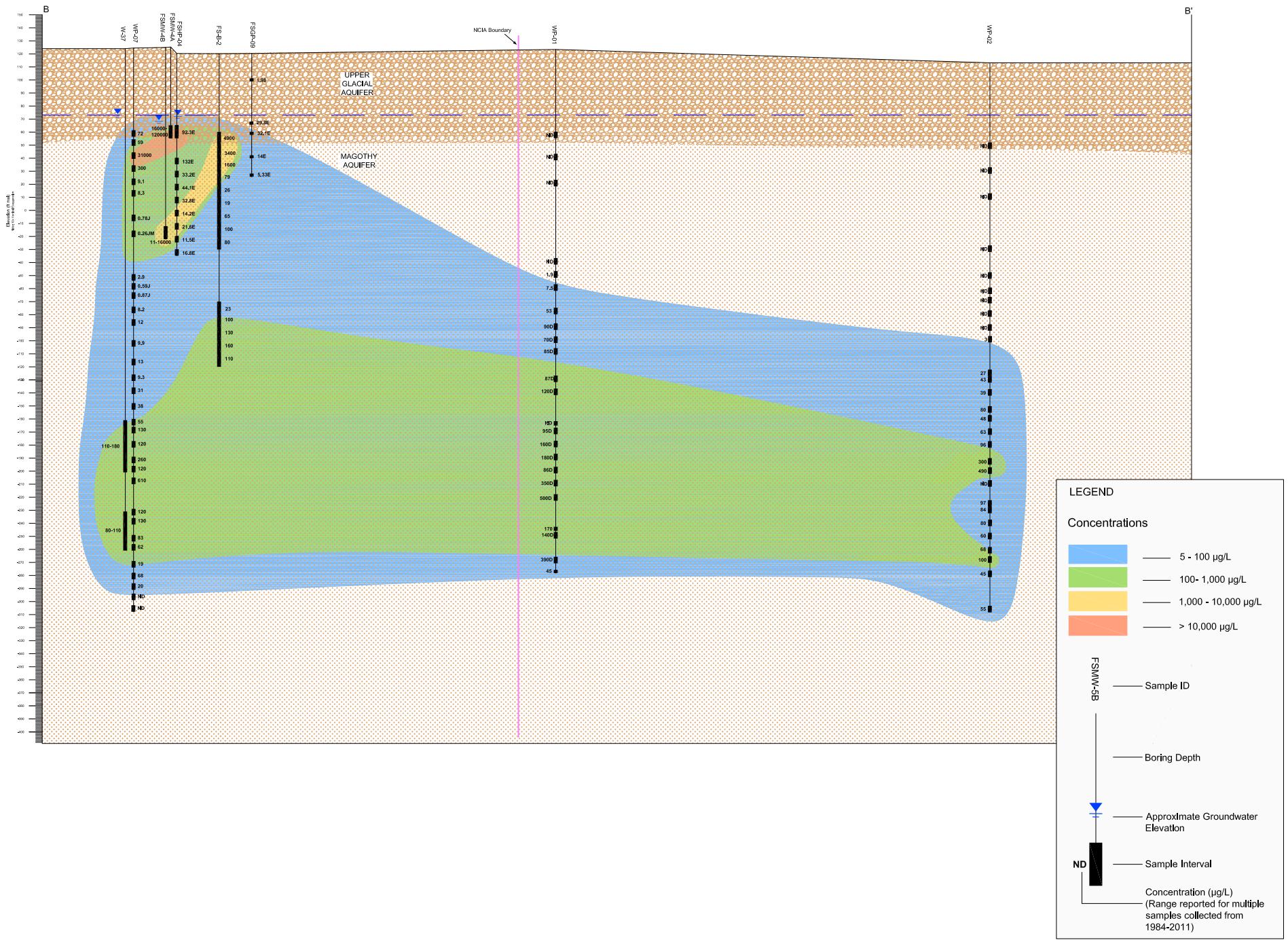
NCIA and OU1, Hempstead, New York

FIGURE
10

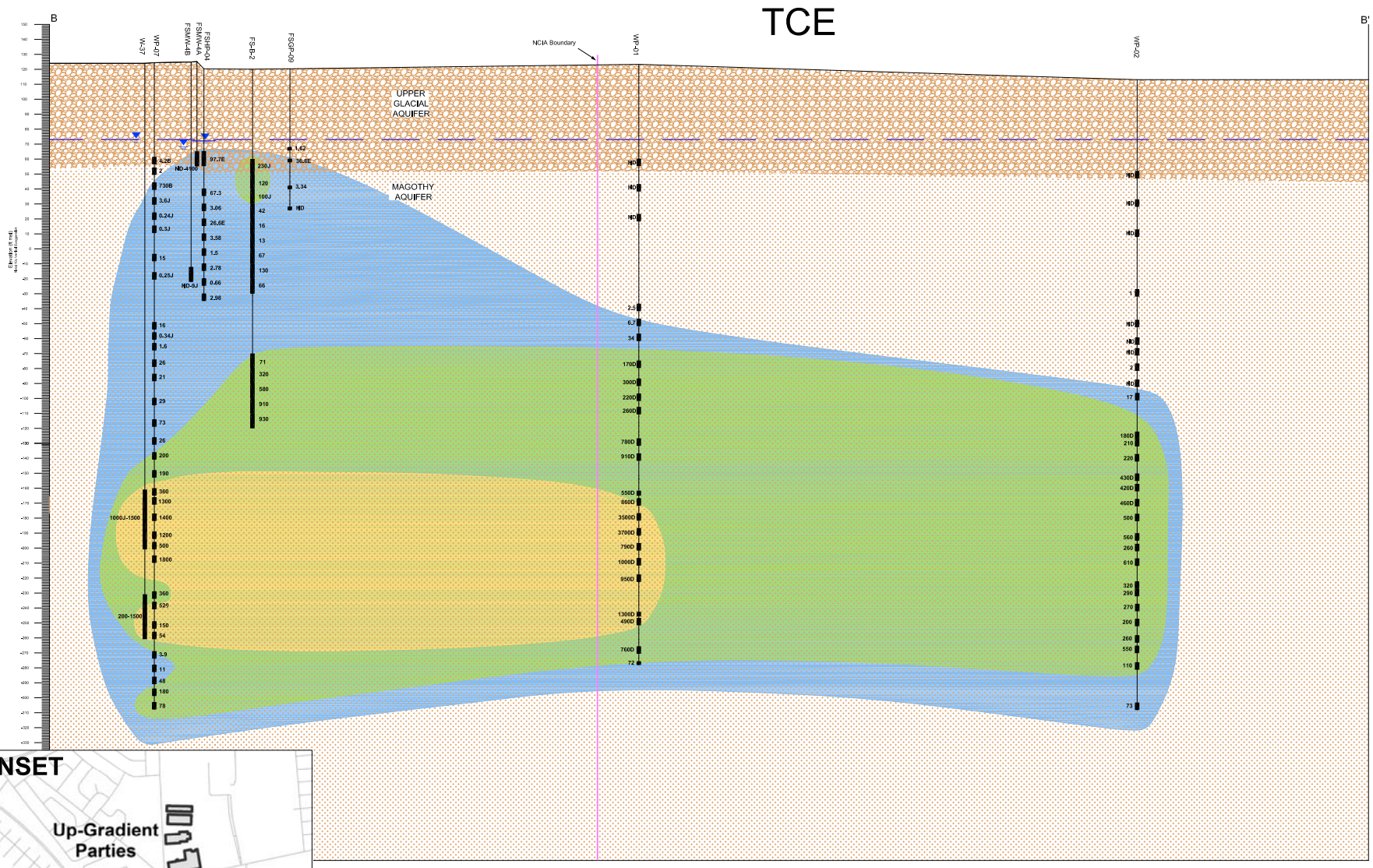
Date: 3/14/2014

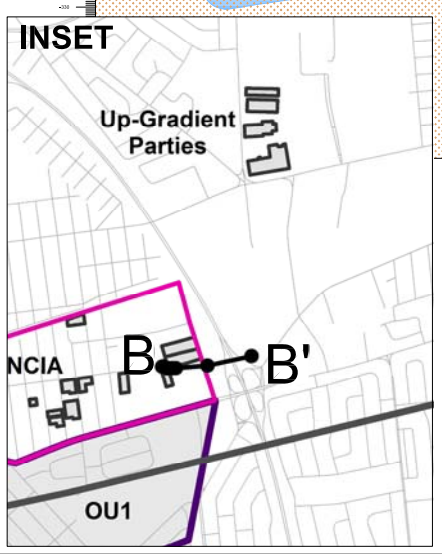
File Path: G:\Projects\209070_IMC\Graphics\CADGIS\114\209070_114_12_A-A_edits.dwg

PCE



TCE





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0 500 1,000
Horizontal Scale in Feet

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Geologic Cross-Section B-B'

NCIA and OU1, Hempstead, New York

FIGURE 11

Date: 3/14/2014

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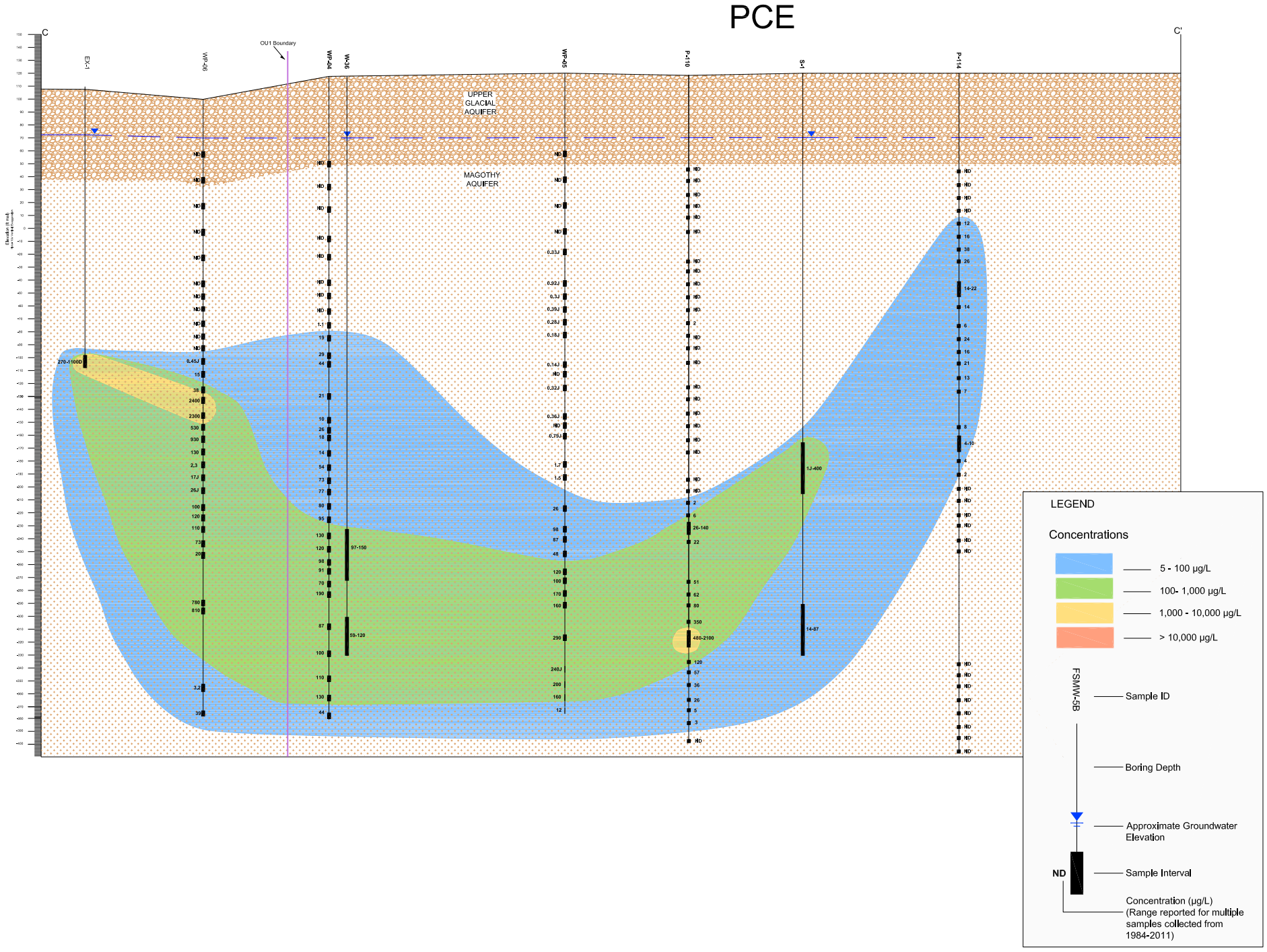
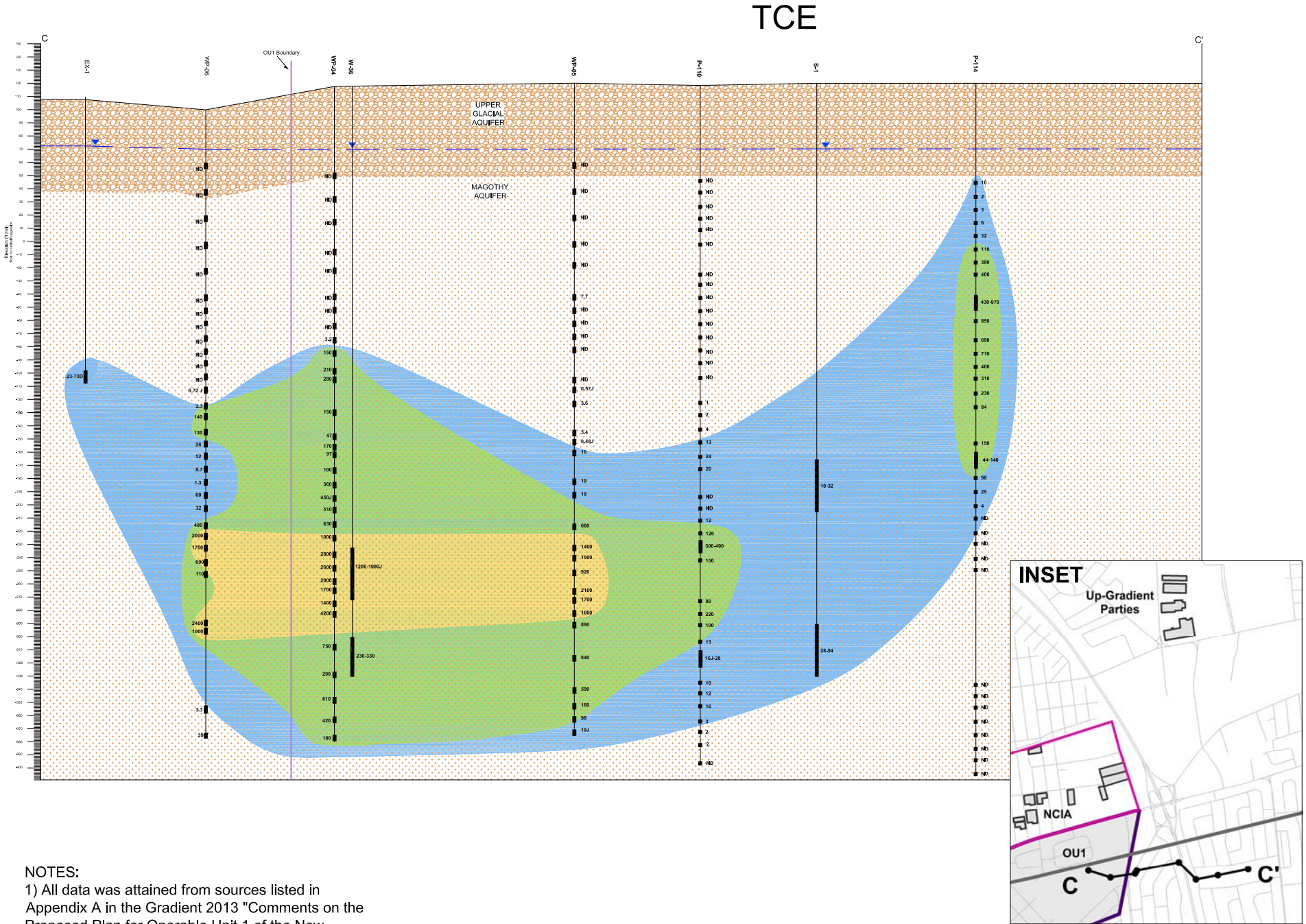
PCE



TCE



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0 500 1,000
Horizontal Scale in Feet

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Geologic Cross-Section C-C'

NCIA and OU1, Hempstead, New York

FIGURE 12

Date: 3/14/2014

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