hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

**Via Email**

September 15, 2016

NC Department of Environmental Quality
Division of Waste Management
Inactive Hazardous Sites Branch
1646 Mail Service Center
217 W. Jones St
Raleigh, NC 27699-1646

Attn: Ms. Amy Axon

Re: Phase II Remedial Investigation Work Plan
Rev. 1
Chapel Hill Police Department Property
828 Martin Luther King, Jr. Blvd.
Chapel Hill, NC
DEQ Site ID NONCD0001486
H&H Job No. TCH-002

Dear Amy:

Enclosed is the revised Phase II Remedial Investigation Work Plan for the Chapel Hill Police Department property. The Work Plan has been revised based upon your comments dated September 1, 2016. For ease of reference, we have provided DEQ's comments below followed by our response on how each comment was addressed.

**Comment**

1. **Page 4, Section 2.1 of the work plan in the second paragraph, it is stated that the thickness of the coal combustion products (CCPs) at the site range from 3 to 15 ft. The maximum thickness reported by Falcon Engineering in the March 25, 2014 Environmental Site Characterization Report, was 25 feet, not 15. Please correct this and ensure that the corrected thickness is considered in the estimations made on total tonnage of CCPs placed at the site.**

**Response**

The Work Plan indicates that the thickness of the CCPs placed at the site "generally ranges from 3 to 15 ft" (emphasis added). There is one boring where CCPs were identified at 25 ft thickness, but all other borings had report thicknesses of 3 ft, 6 ft, 13 ft, 4 ft, 4 ft, 12 ft, 11 ft, 10 ft, 6 ft, and 8 ft. We have modified the Work Plan to include the depths of CCPs identified in each boring

and that the average is approximately 8 ft. This does not change the estimated calculated volume or tonnage of CCPs.

**Comments**

2. **Title 15A NCAC 2T Section .1200 is referenced in Section 2.2 of the work plan and used to establish Maximum Ceiling Concentrations for pollutants within the CCP waste. However, the scope of Title 15A NCAC 2T applies to "the treatment, storage, transportation, use and disposal of coal combustion products that are defined as wastewater treatment residuals….". Therefore, this set of regulations does not relate to the specifics of this site. In conducting the contaminant assessment, you must use the remedial goals for Unrestricted Land Use, outlined in Section 4.1 of the *Inactive Hazardous Sites Program Guidelines for Assessment and Cleanup* (Guidance). This does not mean these will apply as final remediation goals. Please modify the text as needed to reflect this.**

3. **Section 2.2 also references NC General Statute 130A-309.200-.222. While this letter does not serve to address the applicability of the Coal Ash Management Act (CAMA) on this site, use of the rules on closure of the structural fill sites in CAMA maybe useful at this site.**

**Response**

As noted in our report, the placement of CCPs pre-dates the CCP rules and regulations and therefore they are not directly applicable to the site. We were only referencing the current regulations and rules regarding CCPs to demonstrate that re-use of CCPs is allowed. We have revised the Work Plan text for clarification. In the Work Plan, we have compared the soil data to the IHSB preliminary soil remedial goals. We agree that the CAMA rules on closure of structural fill sites may be useful at the subject site.

**Comment**

4. **Antimony, Copper, and Mercury were not listed in Section 3.1, page 9, in the summary of metals that were detected above state groundwater standards. However, in Table 2A these parameters were bolded to indicate an exceedance of these standards (Antimony in MW-1on 5/3/13; Copper in MW-2 on 6/20/13 and Mercury in MW-4 on 2/5/14). Therefore, they should also be added to the list.**

**Response**

As noted in our report, the detections of antimony, copper, and mercury were suspect in the initial sampling events due to elevated turbidity. Subsequent sampling of these wells using lower turbidity sampling methods indicated that these metals were not detected or were detected below groundwater standards. Therefore, consistent with our experience at other sites, we eliminated them as compounds of concern in groundwater. Nevertheless, in accordance with your request,

we have added these metals to the list of COPCs for analysis in the Phase II Remedial Investigation.

**Comment**

5. **In Table 2A, MW-4, sample date 08/20/2014, lists the detected level for total chromium as 7000 ug/l. The lab results that were submitted by Falcon Engineering state that chromium was Below Reporting Limit (BRL). Please clarify.**

**Response**

Falcon's October 3, 2014 report contains a filtered and unfiltered sample for MW-4 for sampling conducted on 8/20/14. The unfiltered sample is reported in units of "µg/kg wet", presumably because of the high amount of sediment in the sample. This sample is the source of "7,000" although technically the units were "µg/kg wet" and not µg/l. The unfiltered sample did not contain detectable levels of chromium. Because the unfiltered sample is not representative of dissolved groundwater conditions, we have removed this sample data from Table 2A and added a note to the table.

**Comment**

6. **Since the background levels of the compounds of potential concerns (COPCs) have not yet been fully delineated, the list of COPCs provided in section 3.6, page 14 and 15, should include all metals <u>detected</u> at the site, not just the ones that have exceeded a standard. Also, all media (groundwater, soil, sediment and surface water) should be sampled for all of the metals on the revised list of COPCs. This would include Zinc, which is a parameter found in past surface water sampling.**

**Response**

Based upon our previous experience, we did not believe that further analysis of naturally occurring metals during the Phase II RI was warranted if they were not detected above PSRGs or standards during the Phase I RI. For example, Section 2.3 of the Guidelines (Subsequent Remedial Investigation Phases: Delineation of Extent of Contamination) indicates that:

> "The extent of contamination must be delineated to the unrestricted use remediation goals … or site-specific natural background levels for metals, if less stringent."

Therefore, if a metal has not been detected above PSRGs or groundwater standards as part of the Phase I RI, delineation is not warranted regardless of the background concentration. Nevertheless, to address DEQ's comment, the COPC list has been expanded to include all metals that have been detected in previous sampling.

**Comment**

7. **Please provide more information on the purpose of the CCP Cover Evaluation as outlined in Section 4.1.1. In particular, what will result from your visual observation of the top 2 feet?**

**Response**
The purpose of the sampling is to determine where CCPs may be present at the site that are not covered with at least 2 ft of soil and therefore may be more susceptible to current or future exposure or erosion. We have added some text in the Work Plan to better explain the purpose of the sampling for clarity.

**Comment**

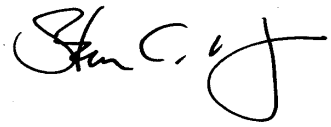
8. **When the revised work plan is submitted, please follow the certification instructions in Section 2.2 #18 of the Guidance.**

**Response**
The certification statements are included in the revised Work Plan.

We look forward to your approval of the Work Plan. Should you have any questions or need additional information, please do not hesitate to call me at (704) 586-0007.

Very truly yours,

***Hart & Hickman, PC***



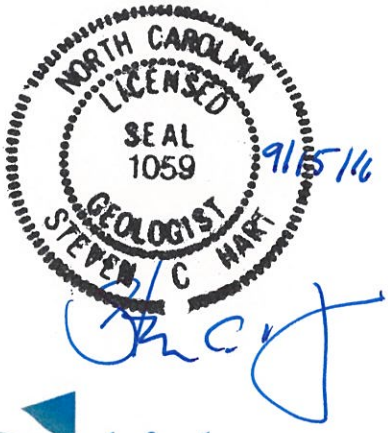
Steven C. Hart, PG
Principal Hydrogeologist

cc: Lance Norris
Curtis Brooks

# Phase II Remedial Investigation
# Work Plan
# Rev. 1

## Chapel Hill Police Department Property
## Chapel Hill, North Carolina
## DEQ ID NONCD0001486

**H&H Job No. TCH-002**
**September 15, 2016**




hart hickman

SMARTER ENVIRONMENTAL SOLUTIONS

**#C-1269 Engineering**
**#-245 Geology**

2923 South Tryon Street, Suite 100
Charlotte, NC 28203
704.586.0007 main

3334 Hillsborough Street
Raleigh, NC 27607
919.847.4241 main

www.harthickman.com

**Remediating Party Certification Page**

"I certify that, to the best of my knowledge, after thorough investigation, the information contained in or accompanying this certification is true, accurate, and complete."

LANCE R. Norris
Name of Remediating Party

Signature of Remediating Party

9/14/16
Date

**NOTARIZATION**

NorthCarolina
(Enter State)

Alamance **COUNTY**

I, a Notary Public of said County and State, do hereby certify that Lance R. Norris did personally appear and sign before me this day, produced proper identification in the form of NC DL, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 14th day of September 2016

Notary Public (signature)

(OFFICIAL SEAL)

ANGELA M ARRINGTON NOTARY PUBLIC ALAMANCE COUNTY, NC MY COMMISSION EXPIRES 10/14/20

My commission expires 10/14/20

## Consultant Certification Page

"I certify that, to the best of my knowledge, after thorough investigation, the information contained in or accompanying this certification is true, accurate, and complete."

Steven Hart
Name of Consultant

Hart & Hickman, PC

Signature of Consultant

9/15/16
Date

**NOTARIZATION**

North Carolina
(Enter State)

Mecklenburg **COUNTY**

I, a Notary Public of said County and State, do hereby certify that Steven Hart did personally appear and sign before me this day, produced proper identification in the form of NC Drivers License, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 15th day of, September, 2016.

Notary Public (signature)

(OFFICIAL SEAL)

My commission expires: 3/31/2020.

CARLA HAHN CANNON
Notary Public
Mecklenburg County
My Commission Expires
3/31/2020
NORTH CAROLINA

**Phase II Remedial Investigation Work Plan**
**Rev. 1**
**Chapel Hill Police Department Property**
**Chapel Hill, North Carolina**
**H&H Job No. TCH-002**

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**Chapel Hill, North Carolina**
**H&H Job No. TCH-002**

## 1.0 Introduction

This Phase II Remedial Investigation Work Plan (Phase II RI Work Plan) has been prepared by Hart & Hickman, PC (H&H) on behalf of the Town of Chapel Hill for the Town of Chapel Hill Police Department property located at 828 Martin Luther King, Jr. Blvd. in Chapel Hill, Orange County, North Carolina (site). This Phase II RI Work Plan has been prepared in accordance with a request from the North Carolina Department of Environmental Quality (DEQ) Inactive Hazardous Sites Branch (IHSB) dated May 5, 2016.

Previous assessment activities conducted at the site indicate that coal combustion products (CCPs) were used for structural fill in the northwestern and central portions of the site in the mid-1960s to mid-1970s. Results of previous assessment activities conducted from 2013 to 2016 indicate that certain metals are present in the CCPs that appear to have migrated to nearby soil and groundwater. Please note that the Town of Chapel Hill did not place the CCPs at the site, but has voluntarily agreed to conduct additional assessment as the current site owner. The Town of Chapel Hill acquired the site in 1980 and constructed the Town of Chapel Hill Police Department building on the site in the early 1980s.

The purpose of this Phase II RI Work Plan is to present proposed methods to further evaluate geologic and hydrogeologic conditions at the site and to collect additional data to better define the extent of impacts identified during previous assessment activities. Previous assessment activities including the Phase I RI were completed by Falcon Engineering in 2013 to 2016 and indicated that the primary compounds of concern at the site are certain heavy metals.

This Phase II RI Work Plan has been prepared in accordance with the DEQ Inactive Hazardous Sites Program *Guidelines for Assessment and Cleanup* (referred to herein as the IHSB Guidance). Remedial investigation activities and methods proposed in this Phase II RI Work Plan will be conducted in general accordance with the IHSB Guidance and the latest version of the U.S. Environmental Protection Agency (EPA) Region 4 Science and Ecosystem Support (SESD) *Field Branches Quality System and Technical Procedures* guidance (hereafter referred to as the EPA SESD Guidance).

The report is organized into sections to include the following:

- Background Information (Section 2.0)
- Summary of Previous Investigations (Section 3.0)
- Phase II Remedial Investigation Plan (Section 4.0)
- Schedule (Section 5.0)

## 2.0 Background Information

### 2.1 Site Background and Setting

The Town of Chapel Hill Police Department property is located at 828 Martin Luther King, Jr. Blvd. in Chapel Hill, NC. The site is approximately 10.24 acres and contains a two-story approximately 35,000 sq ft building located in the north-central portion of the site that is used for police department operations. Asphalt parking lots are located in the northwestern and central portions of the site, and wooded areas are located in the southern and eastern portions of the site. Bolin Creek traverses the southern portion of the site, and a portion of the Bolin Creek Greenway Trail is located in the southern portion of the site just north of and parallel to Bolin Creek. A site map is included as Figure 2.

The site is bordered to the south by a gas station and auto repair business across Bolin Creek, to the east by properties in residential use, to the north by Bolinwood Dr. with residences located beyond, and to the west by Martin Luther King, Jr. Blvd. with a wooded area and residences located beyond. Please note that the Bolin Creek Greenway Trail is in the process of being extended to the west of Martin Luther King, Jr. Blvd. As part of that expansion, certain construction improvements are also planned for the greenway trail in the southern portion of the site. The trail construction improvements on the site have been placed on hold pending the results of the additional assessment activities proposed herein.

The site topography consists of an elevated area where the police department building and parking lots are located which slopes steeply to the south to a lower area along Bolin Creek. Site topography is indicated in Figure 2. Results of previous assessment activities indicate that the site was used as a borrow pit for soil in the 1950s and 1960s, and that CCPs were subsequently placed for use as structural fill at the site in the mid-1960s and 1970s. H&H reviewed previous assessment reports and compared topography from a historical 1946 United States Geological Survey (USGS) topographic map versus current topography to estimate the primary areas of CCP placement. This review indicates that the primary areas of CCP placement are in the central and

western portions of the site in an area of a historical topographic valley. The approximate area of CCP placement is indicated in Figure 2. Based upon the historical topographic map, the topographic high in the eastern portion of the site pre-dates the placement of CCPs at the site; therefore, CCPs are not expected to be present in the eastern portion of the site. The primary area where CCPs were placed at the site covers an area of approximately 176,000 sq ft (approximately 4 acres).

In 2014, Falcon Engineering advanced 12 borings in the northern elevated portions of the site and ten of the borings encountered CCPs. The reported thicknesses of CCPs in the borings were 3 ft, 25 ft, 6 ft, 13 ft, 4 ft, 4 ft, 12 ft, 11 ft, 10 ft, 6 ft, and 8 ft, with an average of approximately 8 ft. The thickness of the cover soil over the CCPs in the borings was reported as 9 ft, 5 ft, 10 ft, 3 ft, 4 ft, 4 ft, 11 ft, 3 ft, 5 ft, 3 ft and 2 ft, with an average of approximately 5 ft. Using the estimated area of approximately 176,000 sq ft and an average CCP thickness of 8 ft, H&H estimates that approximately 50,000 cubic yards of CCPs were placed at the site. Using a CCP bulk density of 1.3 g/cm$^3$ (approximately 80 lbs/ft$^3$) (TVA and Daniel B. Stephens & Associates, 1993), H&H estimates that approximately 55,000 to 60,000 tons of CCP were placed at the site.

## 2.2 North Carolina Coal Combustion Product Regulations

Placement of CCPs at the site predates North Carolina regulations regarding CCPs. Therefore, although current statute and rules may not be directly applicable to conditions at the site, current North Carolina regulations and statutes do allow the re-use of CCPs. For example, North Carolina Administrative Code (NCAC) Title 15A 2T .1203 indicates that certain CCPs that are wastewater treatment residuals are permitted for use by rule (i.e., do not require a permit or notice to DEQ) provided that they do not exceed certain concentrations. These uses include, but are not limited to:

- traction control during snow and ice events;
- as a substitute for blasting grit and roofing granules;
- in flowable fill for backfill of trenches for potable water mains, sanitary sewers, and storm drains; and

- as a base or subbase under a structure or footprint of a paved road, parking lot, sidewalk or similar structure as long as the total depth does not exceed one foot.

In addition, North Carolina General Statutes (NCGS) at Section 130A-309.200 also allow the use of CCPs as structural fill. NCGS 130A-309.219 indicates that projects involving the placement of CCPs of less than 8,000 tons per acre *or* less than 80,000 tons in total per project are deemed permitted, provided they meet certain other requirements in the rules. As noted above, H&H estimates that approximately 55,000 to 60,000 tons of CCPs were placed at the site historically, which is less than 80,000 ton threshold amount for "Large Structural Fills" that is deemed permitted under current rules. NCGS 130A-309.222 indicates that at closure of beneficial fill areas that do not exceed the 80,000 ton threshold quantity, the following must be performed:

- the final surface shall be graded and provided with drainage systems that prevent erosion, promote drainage, minimize infiltration, and prevent ponding.
- erosion control measures much be implemented such as mulching, seeding, or silt barriers to ensure no CCP migration to adjacent properties.

## 3.0 Previous Investigations

Multiple assessments have been conducted at the subject site dating back to 2013. Brief summaries of past investigation reports and groundwater monitoring reports are provided below. Copies of these documents are contained in DEQ's Inactive Hazardous Sites Branch (IHSB) files.

### 3.1 Phase I & Limited Phase II Environmental Site Assessment

In 2013, Falcon Engineering, Inc. (Falcon) conducted a Phase I Environmental Site Assessment (ESA) of the site. The Phase I ESA indicated that CCPs were placed on the site in the 1960s and 1970s for use as structural fill prior to the Town's acquisition of the property.

A Limited Phase II ESA was performed to evaluate the potential for site impact due to the previous placement of CCPs. Three soil borings were advanced at the site at the following locations:

- Boring S-1-/MW-1 was advanced southwest of the site building and a soil sample was collected at a depth of 15 ft below ground surface (bgs). Although not stated in the report, based upon nearby borings advanced at a later date, the solid sample collected was likely soil and not CCP. In addition, monitor well MW-1 was installed to a depth of 40 ft bgs and screened from 30-40 ft bgs.
- Boring S-4 was advanced in the west-central portion of the site to a depth of 1 ft and a sample of apparent CCP was collected for laboratory analysis.
- Temporary monitoring MW-2 was installed to a depth of 8 ft along the Bolin Creek Greenway Trail with a hand auger.
- In addition, Falcon collected a surface water sample from Bolin Creek in the south-central portion of the site (BC-2).

The locations of the previous samples are indicated in Figure 3, and the results are summarized in Tables 2 to 4. In addition, monitor well construction details are summarized in Table 1. A

brief discussion of the data is provided below. Please note that in the data discussions provided below and elsewhere in this report, the metals data are compared to the DEQ IHSB Preliminary Soil Remediation Goals (PSRGs) for soil, the North Carolina 2L Groundwater Standards and Interim Maximum Allowable Concentrations (IMACs) for groundwater, and the North Carolina 2B Standards for surface water. However, naturally occurring background concentrations of metals in environmental media have not been determined (but will be evaluated as part of the Phase II RI Work Plan activities). Therefore, although the below discussions compare data to these screening levels and standards, it is possible that results of the background data evaluation will indicate that some metals concentrations do not exceed background. Therefore, the data discussion is primarily focused on determining which metals have been detected above screening levels and standards to determine potential compounds of concern for analysis during the Phase II RI.

The results of the 2013 Limited Phase II ESA indicated the following:

- The solid samples collected from S-1 and S-4 were initially analyzed for gasoline range total petroleum hydrocarbons (TPH-GRO) and diesel range total petroleum hydrocarbons (TPH-DRO). TPH-GRO was not detected in either sample. TPH-DRO was detected at 8 mg/kg in S-1 and 27 mg/kg in S-4. The concentration of TPH-DRO detected in sample S-1 did not exceed the DEQ Underground Storage Tank (UST) Section action level of 10 mg/kg, but the sample collected from S-4 did exceed the action level. Because the sample from S-4 exceeded the action level, Falcon requested that the S-4 CCP sample be analyzed for volatile organic compounds (VOC) by EPA Method 8260, semi-volatile organic compounds (SVOCs) by EPA Method 8270, extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) by the Massachusetts Department of Environmental Protection (MADEP) methods, and for target analyte list (TAL) metals by EPA Method 6010/7471.

  The results indicated that VOCs, SVOCs, and EPH/VPH hydrocarbon fractions were not detected or were detected below PSRGs in the S-4 CCP sample. Metals detected above PSRGs were aluminum, arsenic, cobalt, and iron.

- The groundwater sample collected from MW-1 was analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, and TAL metals by EPA Method 6010C/6020A/7471B. VOCs and SVOCs were not detected in the sample from MW-1. Arsenic, barium, chromium, iron, manganese, thallium, and vanadium were detected in MW-1 above 2L Standards or IMACs.

- Based on the presence of metals above 2L Standards in MW-1, Falcon collected a groundwater sample from MW-2 and a surface water sample from Bolin Creek, and both samples were analyzed for TAL metals only. Barium, copper, iron, lead, manganese and zinc were detected in MW-2 above the 2L Standards. Zinc was detected in the surface water sample at 45 µg/L, which is above the 2B Standard of 36 µg/L.

Please note that the groundwater samples collected by Falcon likely had high turbidity and therefore the metals data were representative of both suspended sediment in the samples and dissolved metals, and not solely dissolved metals.

### 3.2 Environmental Site Characterization (March 25, 2014)

In 2014, Falcon installed two downgradient monitoring wells near Bolin Creek (MW-3 and MW-4), collected two surface water samples from Bolin Creek (an upgradient sample [BC-1] and a downgradient sample [BC-2]), collected three composite samples of CCP from near the steep slope southwest of the southern parking lot (S-5, S-6 and S-7), and advanced 12 Geoprobe borings to further evaluate the extent of and the compounds present in the CCP (GP-1 through GP-12). Falcon also attempted to install an upgradient well (MW-5), but the well was abandoned because groundwater was not encountered at a depth of 31.5 bgs before DPT refusal.

The results of analysis of the samples indicated the following:

- Groundwater samples collected from MW-3 and MW-4 were analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, RCRA metals by EPA Method 6010/7471, pesticides by EPA Method 8081, polychlorinated biphenyls (PCBs) by EPA Method 8082, and hexavalent chromium by EPA Method 7196. VOCs, SVOCs, pesticides and PCBs were not detected in the samples from MW-3 or MW-4. Metals were not detected in the sample from MW-3 above the 2L Standards except chromium in a duplicate sample. Arsenic, barium, chromium, lead, mercury, and selenium were detected in MW-4 above 2L Standards. As noted above, it appears that the presence of turbidity in the samples may have affected the groundwater sample analytical results.

- Bolin Creek surface water samples collected upstream (BC-1) and downstream (BC-2) were analyzed for the same parameters as the groundwater samples. VOCs, SVOCs, pesticides and PCBs were not detected in either surface water sample. Barium was detected at 24 µg/L in BC-1 and BC-2, which is below the 2B Standard of 1,000 µg/L.

- The composite CCP samples collected from S-5, S-6 and S-7 were analyzed for the same parameters as the groundwater samples. VOCs, SVOCs, pesticides, and PCBs were not detected or were detected below PSRGs, except that the pesticide toxaphene was detected slightly above the protection of groundwater PSRG in the S-7 sample. Metals detected above PSRGs were arsenic, barium, hexavalent chromium, and selenium.

- Samples of CCPs were collected from GP-1 through GP-8, GP-11, and GP-12 for analysis of RCRA metals by EPA Method 6010/7471 and hexavalent chromium by EPA Method 7196. Samples from borings GP-9 and GP-10 were not collected for laboratory analysis because no CCPs were observed. The results of analysis of the CCP samples indicated that the metals arsenic, barium, hexavalent chromium, mercury, and selenium were detected above PSRGs.

### 3.3 Updated Groundwater Sampling Results (September 2, 2014 and October 3, 2014)

After reviewing the Environmental Site Characterization report), DEQ expressed concern about high turbidity levels in the groundwater samples collected from MW-3 and MW-4 and subsequently requested that Falcon resample these wells. The results of the re-sampling are discussed below:

- Falcon redeveloped and purged the two wells on August 15, 2014. Turbidity levels remained elevated (1,500 NTU in MW-3) The sample from MW-3 was analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, RCRA metals by EPA Method 6010/7471, pesticides by EPA Method 8081, PCBs by EPA Method 8082, hexavalent chromium by Standard Method 3500, and turbidity. The sample from MW-4 was analyzed for SVOCs by EPA Method 8270 and turbidity. VOCs, SVOCs, pesticides, and PCBs were not detected in the sample collected from MW-3, and SVOCs were not detected in MW-4. Arsenic, barium, chromium, and lead were detected above the 2L Standards in the sample collected from MW-3. Hexavalent chromium was detected in MW-3 at 30 µg/L, which is above the 2L Standard for total chromium of 10 µg/L.

- Falcon resampled MW-3 and MW-4 on August 20, 2014 using a low flow peristaltic pump and an in-line filter. An additional unfiltered sample was also collected from MW-4. The two filtered samples were analyzed for RCRA metals by EPA Method 6010/7471 and hexavalent chromium by Standard Method 3500. The unfiltered sample from MW-4 was analyzed for RCRA metals by EPA Method 6010C, except mercury was not included in the list of parameters. Barium was the only metal detected in the filtered samples collected from MW-3 (220 µg/L) and MW-4 (75 µg/L), which are below the 2L Standard of 700 µg/L. Hexavalent chromium was not detected in MW-4 and was detected in MW-3 at 23 µg/L, which is above the 2L Standard for total chromium of 10 µg/L. Because total chromium was not detected in the MW-3 but hexavalent chromium was detected, the hexavalent chromium data are suspect. The analytical data for the unfiltered sample

from MW-4 was reported by the laboratory in units of mg/kg-wet, presumably because of the significant amount of sediment in the sample. Arsenic, barium, chromium, lead, and selenium were detected in the sample; however, because of the apparent very high sediment in the sample, H&H does not consider these data to be representative of dissolved phase concentrations in groundwater.

### 3.4 Environmental Site Characterization (Revised: August 18, 2015)

Based upon the results of the August 2014 sampling, DEQ requested that a Phase I RI Work Plan be prepared and submitted. In addition, DEQ expressed concern about the integrity of MW-3 and MW-4 and requested that these wells be abandoned and replaced. A Phase I RI Work Plan was initially submitted on November 10, 2014, and Revision 3 of the Work Plan was submitted on April 14, 2015 and approved by DEQ.

MW-3 and MW-4 were abandoned in January 2015, and replacement monitor wells MW-3A and MW-4A were installed on May 12 and 15, 2015. According to the August 2015 report, the two new wells were sampled on May 26, 2015, but the results were not considered an accurate indication of dissolved phase concentrations because the samples were collected prior to adequate purging of the wells and prior to stabilization of field parameters (pH, turbidity, specific conductivity, and temperature). Monitor wells MW-3A and MW-4A were resampled on July 21, 2015 after field parameters stabilized. The results of the July 21, 2015 sampling are discussed below:

- Groundwater samples collected from MW-3A and MW-4A were analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, RCRA metals plus boron by EPA Method 6010/7471, pesticides by EPA Method 8081, PCBs by EPA Method 8082, and hexavalent chromium by Standard Method 3500. While purging MW-4A, the turbidity level stabilized at 24.7 NTU (above the criteria of 10 NTU), therefore filtered and unfiltered samples were collected from MW-4A. VOCs, SVOCs, pesticides, PCBs and hexavalent chromium were not detected in MW-3A, MW-4A or MW-4A (filtered).

Barium was detected in each of the samples ranging from 61 µg/L to 67 µg/L, which are below the 2L Standard of 700 µg/L. Boron was detected in MW-3A at a concentration of 520 µg/L, which is also below the 2L Standard of 700 µg/L.

### 3.5 Environmental Site Characterization (Revised: April 1, 2016)

Upon review of the August 2015 report, DEQ requested additional information, including a groundwater flow map and collection and analysis of another round of groundwater samples from MW-1, MW-3A, and MW-4A. In addition, because the Town of Chapel Hill is planning on performing construction along the Bolin Creek Greenway Trail in the southern portion of the site as part of its expansion, DEQ also requested collection of samples from the toe of the slope between the CCP fill area and the trail and between the trail and Bolin Creek where trail construction will be performed. DEQ also requested that the next round of groundwater and soil samples be analyzed for a more extensive list of parameters.

In February 2016, Falcon redeveloped MW-1, MW-3A, and MW-4A using surging techniques, and subsequently resampled the wells on February 18, 2016. After redeveloping and purging the three monitoring wells, the turbidity level in MW-3A was below 10 NTUs, but the turbidity in MW-1 and MW-4A remained elevated. Due to the elevated turbidity, both filtered and unfiltered samples were collected from MW-1 and MW-4A.

Seven shallow (2-12 inches bgs) soil or CCP samples were also collected along the greenway trail on February 18, 2016. Samples SS1, SS2, and SS3 were collected from the toe of the slope where possible CCPs were observed. Samples SS4 through SS7 were collected from soil along the south side of the greenway.

The results are described below:

- Groundwater samples collected from MW-1, MW-3A and MW-4A were analyzed for antimony, arsenic, barium, beryllium, boron, cadmium, total chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, vanadium, and zinc by EPA Method 6010/245.1. Arsenic, barium, beryllium, chromium, cobalt, lead, manganese, and vanadium were detected above the 2L Standards or IMACs and at similar concentrations in the filtered and unfiltered samples collected from MW-1. Selenium was not detected in MW-1, but was the only metal detected above the 2L Standard in MW-3A and its duplicate. Metals were not detected above the 2L Standard in the filtered and unfiltered samples collected from MW-4A. For the metals that were detected in MW-4A below 2L Standards (barium, lead, manganese, strontium and zinc), the concentrations were similar in the filtered and unfiltered samples.

- The solid samples collected from SS1 through SS7 were analyzed for the same compounds as noted above for the groundwater samples. Compounds detected above PSRGs were arsenic, barium, cobalt, manganese, selenium, thallium, and vanadium. Higher concentrations were generally detected from the samples collected along the toe of the slope. Please note that total chromium was detected in the samples, but the samples were not analyzed for hexavalent chromium for comparison to PSRGs.

- Groundwater flow was generally determined to be to the south-southeast toward Bolin Creek, although because of well placement and the limited number of wells, a more detailed analysis of groundwater flow is not possible.

Based upon the results of the samples collected along the Bolin Creek Greenway Trail, DEQ performed a health risk evaluation. The health risk evaluation indicated that there was not a significant risk for future construction workers working on the greenway trail or for residents using the greenway trail.

### 3.6 Summary and Data Gap Evaluation

Based upon our evaluation of the previous site assessment activities, and discussions with DEQ, H&H developed the following summary of data and data gaps for the Phase II RI assessment:

- Metals are the primary compounds of concern at the site. The compounds of potential concern (COPCs) that have been detected in soil above PSRGs, in groundwater above 2L Standards/IMACs, and/or above 2B Standards in surface water are the following:
    - Arsenic
    - Barium
    - Beryllium
    - Chromium
    - Hexavalent chromium
    - Cobalt
    - Lead
    - Manganese
    - Selenium
    - Thallium
    - Vanadium
    - Zinc

  Although these compounds have been detected above screening levels and standards, background samples have not been collected to establish naturally occurring concentrations of these compounds. Collection of background soil and groundwater samples are warranted to further evaluate the site COPCs.

- Other metals that have been detected in soil and/or groundwater at the site but below PSRGs and 2L Standards/IMACs are the following:
    - Antimony
    - Cadmium
    - Copper
    - Mercury
    - Nickel
    - Strontium

  At the request of DEQ, these compounds are also retained as COPCs at this time.

- It appears that groundwater impacts are present immediately below the CCP fill area, but have not migrated downgradient to a significant extent toward Bolin Creek.

- Additional monitoring wells are warranted to define the extent of groundwater impacts and further evaluate hydrogeologic conditions including groundwater flow.

- Previous sampling has focused primarily on analysis of CCPs. Only limited sampling of soil has been performed, except for some soil samples along the greenway trail. Additional samples are warranted to evaluate compound concentrations in shallow soil in the elevated portions of the site and along the greenway trail.

- Previous assessment activities indicate that CCPs appear to be exposed in some areas along the slope between the elevated portions of the site and the greenway trail area. Additional observation and sampling is warranted to determine where CCPs may be exposed at or near the ground surface.

- Additional sampling is warranted to verify lack of impact to surface water and sediment in Bolin Creek near the site.

## 4.0 Phase II Remedial Investigation Plan

Based upon the results of the previous assessment activities and data gap evaluation, H&H proposes to collect further assessment of soil, groundwater, surface water, and sediment at the site. The proposed scope of work is presented in the following sections.

### 4.1 Proposed Assessment Activities

#### 4.1.1 Soil Assessment

CCP Cover Evaluation

H&H proposes to advance at least 30 shallow hand auger borings to perform a visual inspection of CCPs along the steep embankment that separates the upper and lower portions of the site. Previous assessment activities indicate that CCPs may be present at or near the ground surface along the steep embankment. Therefore, the purpose of these borings is to visually evaluate where CCPs may be present at the site that are not covered with at least 2 ft of soil and therefore may be more susceptible to current or future exposure or erosion.

Based upon previous assessment activities, the borings will primarily be advanced along the southern embankment, although additional borings will be advanced in the northern, eastern and western portions of the site to evaluate the presence of CCPs near the ground surface in those areas. The approximate locations of borings are indicated in Figure 4. The borings will be advanced on an approximate 50-ft grid along the southern portion of the embankment where CCPs are suspected to be present. Please note that the locations of the borings may be adjusted based upon field conditions such as accessibility.

The borings will be advanced with a stainless steel hand auger to a depth of 2 ft. During boring advancement, visual observations of the soil will be performed and logged to evaluate the presence of soil and/or CCPs. Please note that if CCPs are present within the upper 2 ft of a perimeter boring, then additional borings may be advanced to evaluate areas where CCPs are presents within one ft of ground surface. Please note that the CCP cover boring evaluation will

also be supplemented with the data from the borings described below where samples will be collected for laboratory analysis.

Elevated Area Soil Borings

H&H proposes to advance five soil borings in the elevated portions of the site to 1) evaluate shallow soil metals concentrations where potential human exposure would occur (existing samples from this area are only from CCPs at depth), and 2) collect samples of the CCPs for leachate analysis to evaluate the potential for metals to leach to groundwater. These borings will be advanced with a direct push technology (DPT) rig. At each boring location, a soil sample will be collected from a depth of 0-1 ft for analysis of the site soil COPCs (antimony, arsenic, barium, beryllium, cadmium, chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, strontium, thallium, vanadium, and zinc). In addition, each boring will be advanced to a deeper depth so that a sample of CCP can be collected for leachate analysis. The deeper soil samples will be analyzed for the site groundwater COPCs (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, strontium, thallium, vanadium, and zinc) following the Synthetic Precipitation Leaching Procedure (SPLP; EPA Method 1312). The depth that the deeper samples will be collected will be determined in the field based upon observations of CCPs made at the time of boring advancement.

In addition to these five soil borings, a shallow soil sample from a depth of 0-1 ft will also be collected from the boring for the proposed monitor well in the eastern portion of the site (see Section 4.1.2 below and Figure 5). This sample will also be analyzed for the soil COPCs.

Lower Area Soil Borings

H&H also proposes to advance four shallow soil borings in the southern "lower" portions of the site to evaluate previous chromium detections and further evaluate compound concentrations in shallow soil along the greenway. The locations of the soil borings are indicated in Figure 5. Two of the borings will be advanced in the approximate previous location of borings SS-2 and SS-5, one boring will be located in the southeastern portion of the site along the greenway, and one soil sample will be collected from the monitoring well boring in the southwestern portion of

the site along the greenway. Except for the monitoring well boring, the soil borings will be advanced with a hand auger. The monitoring well boring will be advanced with a DPT. All of the lower area soil samples will be collected from a depth of 0-1 ft.

The samples collected adjacent to previous boring locations SS-2 and SS-5 will be analyzed for chromium and hexavalent chromium only to evaluate the valence states of the previous chromium detections in soil at these borings. The soil samples collected from the other two borings will be analyzed for the site soil COPCs (antimony, arsenic, barium, beryllium, cadmium, chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, strontium, thallium, vanadium, and zinc).

Background Samples

H&H proposes to collect a total of 10 background soil samples from five background soil borings to establish naturally occurring concentrations of metals in soil. One of these borings will be located in the northwest portion of the site that will also be the location of the background monitoring well. Please note that if there is evidence of CCPs in the background soil boring, then an alternate location for the upgradient monitoring well boring will be selected. The other four samples will be collected along the greenway expansion area upgradient (west) of the site. The exact locations of the borings will be determined in the field based upon observed conditions.

Except for the upgradient monitoring well boring, the borings will be advanced with a hand auger to a depth of approximately 3 ft below ground surface. It is anticipated that the soil samples from the upgradient monitoring well boring will be collected with a DPT (although the monitoring well will be installed with air rotary as described in Section 4.1.2 below). Two soil samples will be collected from each boring for laboratory analysis. One soil sample will be collected from a depth of 0-1 ft, and second sample will be collected from a depth of approximately 2-3 ft. At the monitoring well boring, the samples will be collected from a depth of 0-1 ft and a deeper sample will be collected above groundwater based upon soil horizons

observed during boring advancement. The background soil samples will be analyzed for the site soil COPCs.

### 4.1.2 Groundwater Assessment

Additional Monitoring Wells

H&H proposes to install three additional monitor wells at the site in the locations described below. The locations of the proposed wells are indicated in Figure 5.

- One monitoring well will be installed in the northwestern portion of the site to evaluate background concentrations of metals in groundwater. Note that if there is evidence of CCPs during drilling of this monitoring well boring, an alternate upgradient well location will be selected.

- One monitoring well will be installed in the southwestern portion of the site along the greenway trail to evaluate groundwater conditions southwest of the CCP fill area.

- One monitoring well will be installed in the eastern portion of the site to evaluate groundwater conditions east of the CCP fill area.

The wells will also be located to better establish groundwater flow direction.

Based upon previous assessment activities, the background monitoring well boring will be advanced with an air rotary drill rig. The monitoring well borings in the southwestern and eastern portions of the site will be advanced with DPT capable of turning hollow stem augers.

The monitoring wells will be constructed in accordance with the North Carolina well construction regulations. The monitoring wells will be constructed of 2-inch diameter PVC with a 10-ft well screen which is set to bracket the water table. To reduce turbidity, the monitoring wells will be installed with pre-packed well screens. Following installation, the new monitoring wells will be properly developed utilizing bailers and/or pumps. The monitor wells will be developed in accordance with standard EPA Region 4 SESD protocols.

Groundwater Sampling and Analysis

Following monitoring well installation, groundwater samples will be collected from the newly installed and existing site monitoring wells. As part of the groundwater sampling effort, a complete round of water level measurements will be collected from each monitoring well using an electronic water level meter. Purging and sampling of the monitoring wells will be completed using the low flow/low stress purging and sampling method in accordance with EPA Region 4 SESD protocols, and turbidity will be reduced to below 10 NTU prior to sampling. If turbidity cannot be reduced to below 10 NTU, then an unfiltered and field filtered sample will be collected from that monitoring well for analysis.

The groundwater samples well will be submitted to a North Carolina certified laboratory or field tested as follows:

- Groundwater from each monitoring well will be field analyzed for dissolved oxygen, pH, conductivity, temperature, and turbidity.

- Groundwater samples collected from each monitoring well will be analyzed for the site groundwater COPCs (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, strontium, thallium, vanadium, and zinc).

Upon collection, groundwater samples will be packed in an ice filled cooler and shipped to a North Carolina certified laboratory under chain-of-custody protocol for analysis.

### 4.1.3 Surface Water/Sediment Samples

H&H proposes to collect surface water and sediment samples from five locations in Bolin Creek. The approximate locations of the samples are indicated in Figure 5. Two sample locations will be upgradient of the site west of Martin Luther King, Jr. Blvd., two sample locations will be collected south of the CCP fill area, and one sample will be collected near or downgradient of the

southeastern site boundary. Please note that the locations of the samples may be adjusted based upon the location of accumulated sediment in the creek.

The surface water samples will be collected by placing the sample bottles directly into the flowing stream and allowing the bottles to fill with water. The sediment samples will be collected with a stainless steel hand auger or stainless steel scoop. The samples will be collected from downgradient to upgradient locations, and the surface water samples will be collected prior to the sediment samples at each location. The samples will be collected during apparent base flow conditions.

The samples will be analyzed for the following:

- Surface water from each location will be field analyzed for dissolved oxygen, pH, conductivity, temperature, and turbidity.

- The sediment and surface water samples from each locations will be analyzed for the soil COPCs (antimony, arsenic, barium, beryllium, cadmium, chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, strontium, thallium, vanadium, and zinc).

### 4.2 Laboratory Analytical Methods

All of the metals analyses will be conducted by EPA Method 6010, except hexavalent chromium. Hexavalent chromium will be analyzed by EPA Method 7199. EPA Method 7199 is an ion chromatography method which is less likely to be impacted by matrix color interference as compared to EPA Method 7196 and Standard Method 3500 which are colorimetric methods previously used for analysis of hexavalent chromium.

### 4.3 Aquifer Tests

H&H will conduct rising head slug tests on the site wells as part of the assessment activities to evaluate aquifer hydraulic conductivity. The slug tests will be conducted by slowly lower a slug

into a well, allowing the water level to recover, rapidly removing the slug, and then monitoring water level recovery with time. Water level recovery data will be collected using a pressure transducer and data logger. It is anticipated that the data will be evaluated using the Bouwer and Rice method.

### 4.4 Decontamination

Equipment utilized during the RI activities will be decontaminated in general accordance with EPA Region 4 SESD protocols. Drilling equipment will be pressure washed in a field decontamination pit. Decontamination water will be removed from the decontamination pits and containerized into drums with monitor well purge (see below).

### 4.5 Investigative Derived Waste

Investigation derived waste (IDW) generated during the assessment activities will be containerized and characterized. The IDW anticipated to be generated during the Phase II RI activities includes soil cuttings, purge water, and decontamination water. The IDW will be containerized in 55-gallon drums pending off-site disposal. Samples of the IDW will be collected and submitted for laboratory analysis of toxicity characteristic leaching procedure (TCLP) RCRA metals. Upon receipt of the analytical results, the IDW will be profiled and properly disposed at an off-site facility.

### 4.6 Quality Assurance Samples

The following field quality assurance/quality control (QA/QC) samples will be collected during the field activities:

- **Rinseate Blanks** - These are samples collected from decontaminated sampling equipment utilizing laboratory supplied de-ionized water. These samples serve as a QC check to ensure proper decontamination of sampling equipment. One rinseate blank

will be collected per sample equipment type that is collected with decontaminated sampling equipment (i.e., soil, sediment, and groundwater) per matrix during the Phase II RI activities.

- **Field Duplicate Samples** - Duplicate samples are collected to check analytical repeatability. One duplicate sample will be collected per matrix type (i.e., soil, groundwater, surface water, and sediment) per analysis analysis during the Phase II RI activities.

### 4.7 Surveying and Sample Locations

H&H will contract with a registered land surveyor to establish the horizontal and vertical location of each of the soil, surface water, and sediment sample collected at the site. In addition, the surveyor will determine the top of casing, ground level, and horizontal elevation of each monitoring well.

### 4.8 Phase II Remedial Investigation Report

Following completion of the field activities and review and evaluation of the data, a Phase II RI Report will be prepared. The Phase II RI Report will include the following:

- a narrative description of how the investigation was conducted, including a discussion of variances from the Phase II RI Work Plan;
- a description of groundwater monitoring well installation procedures, including drilling methods used, completed drilling logs, "as built" drawings of monitoring wells, well construction techniques and materials, and geologic logs;
- a map, drawn to scale, showing soil sample and monitoring well locations in relation to known areas of concern;
- a description of field and laboratory quality control and quality assurance procedures;
- a description of procedures used to manage investigation derived waste;

- a summary of site geologic conditions, including a description of soil and vadose zone characteristics;
- a description of site hydrogeologic conditions including notable aquifer characteristics, a water table elevation contour map with groundwater flow patterns depicted, and tabulated groundwater elevation data;
- tabulation of analytical results for sampling (including sampling dates and soil sampling depths) and copies of laboratory reports including quality assurance/quality control documentation; and
- hydrogeoloic cross sections.

## 5.0 Schedule

The activities will be conducted in accordance with the following estimated schedule:

| **Task** | **Date** |
|---|---|
| Initiate Field Activities | Within 30 days following Work Plan Approval |
| Complete Field Activities | Within 30 days following initiation of field activities |
| Submit Phase II RI Report | Within 60 days following completion of field activities |

H&H anticipates that the Phase II RI Report will be submitted within 120 days of Work Plan approval.

## 6.0 References

TVA and Daniel B Stephens and Associates. 1993. Physical and Hydraulic Properties of Fly Ash and Other By-Products from Coal Combustion. EPRI TR-101999. February 1993.

**Table 1**
**Monitor Well Construction Details**
**Chapel Hill Police Department**
**Chapel Hil, North Carolina**
**H&H Job No. TCH-002**

| Well ID | Permanent or Temporary | Date Installed | Date Abandoned | Drilling Method | Well Description | Screen Slot Size (in) | Total Depth (ft bls) | Screened Interval |
|---|---|---|---|---|---|---|---|---|
| MW-1 | Permanent | 4/29/2013 | | DPT | 2" PVC | 0.01 | 40 | 30-40 |
| MW-2 | Temporary | 6/20/2013 | 6/20/2013 | HA | Unknown | Unknown | 8 | Unknown |
| MW-3 | Permanent | 1/27/2014 | 1/7/2015 | Auger | 2" PVC | 0.01 | 11 | 6-11 |
| MW-4 | Permanent | 1/27/2014 | 1/6/2015 | Auger | 2" PVC | 0.01 | 9.2 | 4.2-9.2 |
| MW-3A | Permanent | 5/12/2015 | | Air Rotary | 2" PVC | 0.01 | 16 | 1-16 |
| MW-4A | Permanent | 5/14/2015 | | Air Rotary | 2" PVC | 0.01 | 19 | 4-19 |

Notes:
ft = feet
bls = below land surface
DPT = Direct Push Technology
HA = Hand Auger

**Table 2A (page 1 of 1)**
**Groundwater Analytical Data - Metals**
**Chapel Hill Police Department**
**Chapel Hill, North Carolina**
**H&H Job No. TCH-002**

| Monitoring Well ID | Sample Date | turbidity | aluminum | antimony | arsenic | barium | beryllium | boron | cadmium | calcium | hexavalent chromium | trivalent chromium | Total chromium | cobalt | copper | iron | lead | magnesium | manganese | mercury | molybdenum | nickel | potassium | selenium | silver | sodium | strontium | thallium | vanadium | zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2L Standard or IMAC** | | NS | NS | 1 | 10 | 700 | 4 | 700 | 2 | NS | NS | NS | 10 | 1 | 1,000 | 300 | 15 | NS | 50 | 1 | NS | 100 | NS | 20 | 20 | NS | NS | 0.2 | 0.3 | 1,000 |
| **MW-1** | 5/3/2013 | NA | 5,600 | **5.4** | **85** | **1,100** | 1.6 | NA | 0.17 | 110,000 | NA | NA | **15** | **15** | 25 | **6,500** | 5.8 | 25,000 | **7,600** | ND | NA | 12 | 7,600 | 2.5 | ND | 34,000 | NA | **1.0** | **38** | 52 |
| | 2/18/2016 | NS | NA | ND | **67** | **1,300** | 11 | ND | ND | NA | NA | NA | **100** | **78** | 170 | NA | **36** | NA | **9,600** | 0.26 | ND | 58 | NA | ND | ND | NA | 2,900 | ND | **260** | 330 |
| | 2/18/2016 [4] | NS | NA | ND | **52** | **1,100** | **8.8** | ND | ND | NA | NA | NA | **86** | **61** | 130 | NA | **29** | NA | **9,000** | 0.21 | ND | 46 | NA | ND | ND | NA | 2,700 | ND | **200** | 260 |
| **MW-2** | 6/20/2013 [1] | NA | 16,000 | 0.61 | 8.3 | **1,100** | **5.5** | NA | 0.93 | 260,000 | NA | NA | 8.4 | **23** | **1,200** | **13,000** | **27** | 47,000 | **1,200** | 0.18 | NA | 70 | 42,000 | 18 | 0.27 | 52,000 | NA | **0.48** | **71** | **2,200** |
| **MW-3** | 2/5/2014 | NA | NA | NA | ND | 160 | NA | NA | ND | NA | ND | NA | ND | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| | 2/5/2014 [2] | NA | NA | NA | ND | 250 | NA | NA | ND | NA | ND | NA | **24** | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| | 8/15/2014 [3] | 1,500 | NA | NA | **51** | **830** | NA | NA | ND | NA | **30** | NA | **78** | NA | NA | NA | **30** | NA | NA | ND | NA | NA | NA | ND | ND | NA | NA | NA | NA | **NA** |
| | 8/20/2014 [4] | 13 | NA | NA | ND | 220 | NA | NA | ND | NA | **23** | NA | ND | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| **MW-3A** | 7/21/2015 | 5.7 | NA | NA | ND | 67 | NA | 520 | ND | NA | ND | NA | ND | NA | NA | NA | ND | NA | NA | ND | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| | 2/17/2016 | 1.3 | NA | ND | ND | 89 | ND | ND | ND | NA | NA | NA | ND | ND | ND | NA | ND | NA | ND | ND | ND | ND | NA | **23** | ND | NA | 2,400 | ND | ND | ND |
| | 2/17/2016 [2] | 1.3 | NA | ND | ND | 80 | ND | ND | ND | NA | NA | NA | ND | ND | ND | NA | ND | NA | 23 | ND | ND | ND | NA | **26** | ND | NA | 2,100 | ND | ND | ND |
| **MW-4** | 2/5/2014 | NA | NA | NA | **140** | **6,500** | NA | NA | 1.7 | NA | ND | NA | **930** | NA | NA | NA | **250** | NA | NA | **1.4** | NA | NA | NA | **99** | ND | NA | NA | NA | NA | NA |
| | 8/20/2014 [4,5] | <10 | NA | NA | ND | 75 | NA | NA | ND | NA | ND | NA | ND | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| **MW-4A** | 7/21/2015 | 24.7 | NA | NA | ND | 64 | NA | ND | ND | NA | ND | NA | ND | NA | NA | NA | ND | NA | NA | ND | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| | 7/21/2015 [4] | 24.7 | NA | NA | ND | 61 | NA | ND | ND | NA | ND | NA | ND | NA | NA | NA | ND | NA | NA | ND | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| | 2/18/2016 | 189 | NA | ND | ND | 26 | ND | ND | ND | NA | NA | NA | ND | ND | ND | NA | 7.8 | NA | 49 | ND | ND | ND | NA | ND | ND | NA | 110 | ND | ND | 34 |
| | 2/18/2016 [4] | 189 | NA | ND | ND | 33 | ND | ND | ND | NA | NA | NA | ND | ND | ND | NA | 8.4 | NA | 41 | ND | ND | ND | NA | ND | ND | NA | 78 | ND | ND | 48 |

**Notes:**
All results in ug/l, except turbidity which is NTUs
2L standards from Title 15A NCAC 2L .0202
IMAC = Interim Maximum Allowable Concentration
**Bold** denotes above the 2L standard or IMAC
ND - Not Detected; NA - Not Analyzed; NS - Not Specified
[1] Denotes sample labeled as "Well #1" in the lab report associated with the Limited Phase II ESA prepared by Falcon
[2] Denotes duplicate sample taken.
[3] Denotes sample labeled as "Well 1" in the lab report associated with the October 3, 2014 letter prepared by Falcon
[4] Denotes filtered samples
[5] An unfiltered sample was also collected from MW-4 on August 20, 2014 and the results were reported in mg/kg-wet, presumably because of the high sediment load. These data are not included in this table.
**Analytical Methods:**
Metals by EPA Method 6010C & 6020A
Hexavlent Chromium by EPA Method 7196A / SM3500
Mercury by 7470A/245.1

# Table 2B (page 1 of 1)
# Groundwater Analytical Data - SVOCs, VOCs, Pesticides, and PCBs
# Chapel Hill Police Department
# Chapel Hill, North Carolina
# H&H Job No. TCH-002

| Monitoring Well ID | Sample Date | SVOCs | VOCs | Pesticides | PCBs |
|---|---|---|---|---|---|
| | | SVOCs | VOCs | Pesticides | PCBs |
| **2L Standards** | | | | | |
| **MW-1** | 5/3/2013 | ND | ND | NA | NA |
| **MW-2** | 6/20/2013 [1] | NA | NA | NA | NA |
| **MW-3** | 2/5/2014 | ND | ND | ND | ND |
| | 2/5/2014 [2] | ND | ND | ND | ND |
| | 8/15/2014 [3] | ND | ND | ND | ND |
| **MW-3A** | 7/21/2015 | ND | ND | ND | ND |
| **MW-4** | 2/5/2014 | ND | ND | ND | ND |
| | 8/15/2014 | ND | NA | NA | NA |
| **MW-4A** | 7/21/2015 | ND | ND | ND | ND |
| | 7/21/2015 [4] | ND | ND | ND | ND |

**Notes:**
All results in ug/L
**Bold** denotes above the 2L standards from Title 15A NCAC 2L .0202
ND - Not Detected; NA - Not Analyzed; NS - Not Specified
[1] Denotes sample labeled as "Well #1" in the lab report associated with the Limited Phase II ESA prepared by Falcon
[2] Denotes duplicate sample taken.
[3] Denotes sample labeled as "Well 1" in the lab report associated with the October 3, 2014 letter prepared by Falcon
[4] Denotes filtered samples
**Analytical Methods**
SVOCs = Semi-Volatile Organic Compounds by EPA Method 8270
VOCs = Volatile Organic Compounds by EPA Method 8260
Pesticides by Method 8081B
PCBs by 8082A

**Table 3A (page 1 of 1)**
**Surface Water Analytical Data - Metals**
**Chapel Hill Police Department**
**Chapel Hill, North Carolina**
**H&H Job No. TCH-002**

| Surface Water Sampling Point ID | Sample Date | aluminum | antimony | arsenic | barium | beryllium | cadmium | calcium [2] | hexavalent chromium | trivalent chromium | total chromium | cobalt | copper | iron | lead | magnesium | manganese | mercury | nickel | potassium | selenium | silver | sodium | thallium | vanadium | zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2B Standard [1]** | | NS | NS | 10 | 1,000 | 6.5 | 0.15 | 100,000 | 11 | 24 | NS | NS | 2.7 | NS | 0.54 | NS | NS | 0.012 | 16 | NS | 5 | 0.06 | NS | NS | NS | 36 |
| **BC-2 (Bolin Creek at Site)** | 6/20/2013 | 290 | ND | 0.9 | 27 | ND | ND | 16,000 | NA | ND | ND | 0.37 | 2.6 | 860 | 0.5 | 5,300 | 100 | ND | 1.2 | 2,300 | ND | ND | 7,800 | ND | ND | **45** |
| | 2/5/2014 | NA | NA | ND | 24 | NA | ND | NA | ND | ND | ND | NA | NA | NA | ND | NA | NA | ND | NA | NA | ND | ND | NA | NA | NA | NA |
| **BC-1 (Upgradient)** | 2/5/2014 | NA | NA | ND | 24 | NA | ND | NA | ND | ND | ND | NA | NA | NA | ND | NA | NA | ND | NA | NA | ND | ND | NA | NA | NA | NA |

**Notes:**
All results in ug/l
[1] NC 2B Standard - North Carolina Surface Water Quality Standard adopted per 15A NCAC 2B Section .0100. Values are the lowest of the Freshwater, Water Supply, and Human Health values because Bolin Creek is a WS V classification surface water
[2] the 2B value for calcium is based on total hardness, with a limit of 100,000 ug/L as calcium carbonate
**Bold** denotes above the 2B standard
ND - Not Detected; NA - Not Analyzed; NS - Not Specified
**Analytical Methods:**
Metals by 6010C, 6020A
Mercury by 7470A

# Table 3B (page 1 of 1)
# Surface Water Analytical Data - SVOCs, VOCs, Pesticides, and PCBs
# Chapel Hill Police Department
# Chapel Hill, North Carolina
# H&H Job No. TCH-002

| Surface Water Sampling Point ID | Sample Date | SVOCs | VOCs | Pesticides | PCBs |
|---|---|---|---|---|---|
| | | SVOCs | VOCs | Pesticides | PCBs |
| **2B Standards** | | | | | |
| **Bolin Creek/(BC-2)** | 6/20/2013 | NA | NA | NA | NA |
| | 2/5/2014 | ND | ND | ND | ND |
| **Background/(BC-1)** | 2/5/2014 | ND | ND | ND | ND |

**Notes:**
All results in ug/l
1) NC 2B Standard - North Carolina Surface Water Quality Standard adopted per 15A NCAC 2B or are National Criteria per EPA from table dated May 15, 2013. Values are the lowest of the Freshwater, Water Supply, and Human Health values because Bolin Creek is a WS-V classification stream
**Bold** denotes above the 2L standard
ND - Not Detected; NA - Not Analyzed; NS - Not Specified
**Analytical Methods**
SVOCs = Semi-Volatile Organic Compounds by EPA Method 8270
VOCs = Volatile Organic Compounds by EPA Method 8260
Pesticides by Method 8081B
PCBs by 8082A

**Table 4A (page 1 of 1)**
**Soil and CCP Analytical Data - Metals**
**Chapel Hill Police Department**
**Chapel Hill, North Carolina**
**H&H Job No. TCH-002**

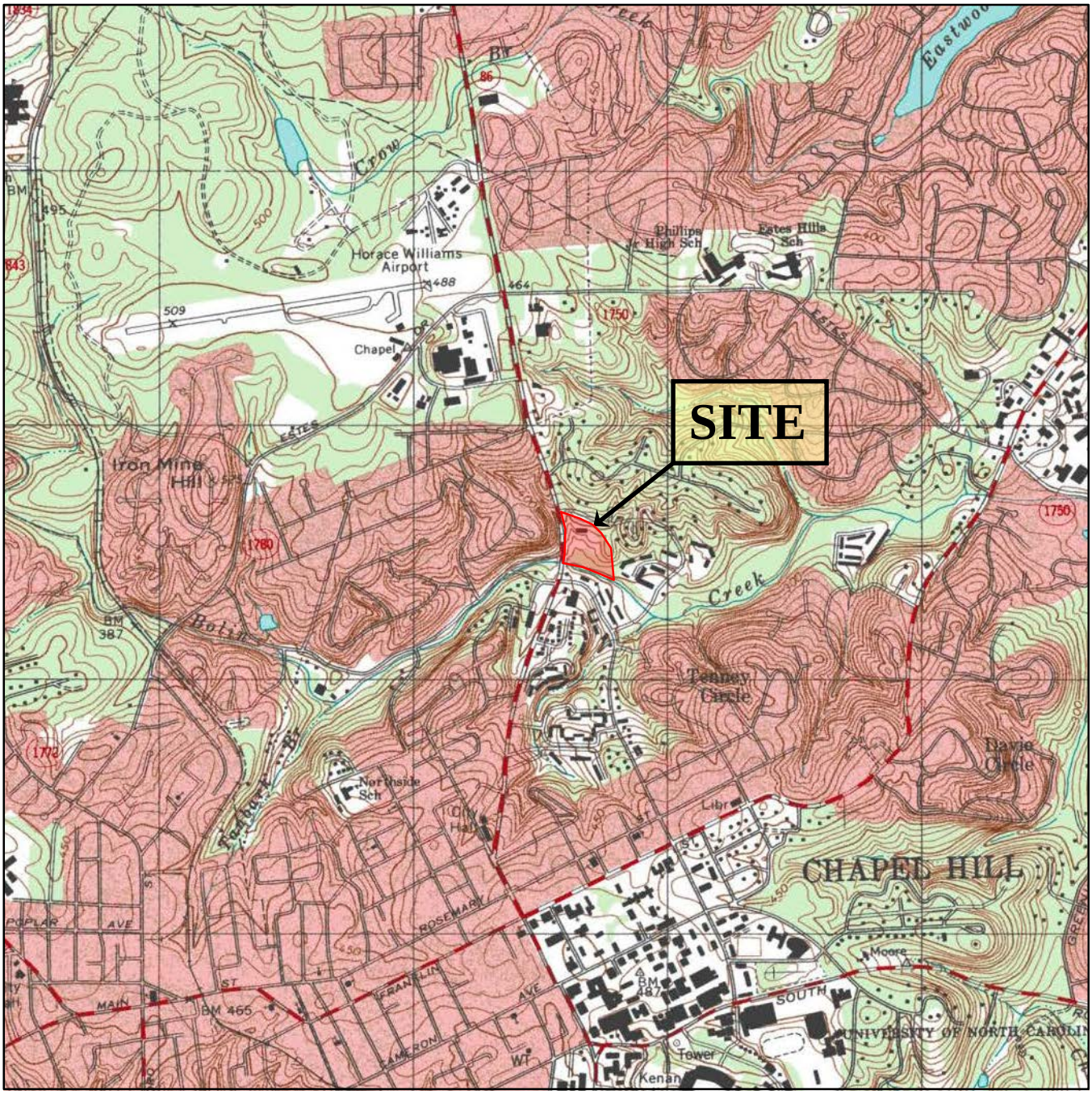
| Sample ID | Sample Date | Material Sampled (Soil or CCP) | Sample Depth | aluminum | antimony | arsenic | barium | beryllium | boron | cadmium | calcium | hexavalent chromium | trivalent chromium | total chromium | cobalt | copper | iron | lead | magnesium | manganese | mercuy | molybdenum | nickel | potassium | selenium | silver | sodium | strontium | thallium | vanadium | zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S-4** | 4/29/2013 | CCP | 1 ft | 23,000 | ND | **14** | 24 | ND | NA | 1.5 | 9,900 | NA | NA | 22 | **30** | 65 | **59,000** | 20 | 9,000 | 1,500 | 0.011 | NA | 43 | 680 | ND | ND | 150 | NA | ND | **21** | 120 |
| **S-5** | 1/31/2014 | CCP | 0-4 ft | NA | NA | **37** | **2,800** | NA | NA | ND | NA | 1.3 | 19.7 | 21 | NA | NA | NA | 10 | NA | NA | 0.30 | NA | NA | NA | **3.2** | ND | NA | NA | NA | NA | NA |
| **S-6** | 1/31/2014 | CCP | 0-4 ft | NA | NA | **43** | **3,200** | NA | NA | ND | NA | 2.7 | 19.3 | 22 | NA | NA | NA | 12 | NA | NA | 0.42 | NA | NA | NA | **6.1** | ND | NA | NA | NA | NA | NA |
| **S-7** | 1/31/2014 | CCP | 0-4 ft | NA | NA | **44** | **2,500** | NA | NA | ND | NA | 1.4 | 27.6 | 29 | NA | NA | NA | 11 | NA | NA | 0.44 | NA | NA | NA | **4.5** | ND | NA | NA | NA | NA | NA |
| **GP-1** | 2/3/2014 | CCP | 8-12 ft | NA | NA | 3.5 | 86 | NA | NA | ND | NA | ND | 8.8 | 8.8 | NA | NA | NA | 26 | NA | NA | 0.083 | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| **GP-2** | 2/3/2014 | CCP | 26-28 ft | NA | NA | **41** | **1,100** | NA | NA | ND | NA | ND | 19 | 19 | NA | NA | NA | 11 | NA | NA | 0.24 | NA | NA | NA | **4** | ND | NA | NA | NA | NA | NA |
| **GP-3** | 2/3/2014 | CCP | 10-12 ft | NA | NA | **48** | **1,200** | NA | NA | ND | NA | 0.53 | 22.47 | 23 | NA | NA | NA | 39 | NA | NA | 0.42 | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| **GP-4** | 2/4/2014 | CCP | 10-12 ft | NA | NA | **59** | **2,900** | NA | NA | ND | NA | ND | 20 | 20 | NA | NA | NA | 11 | NA | NA | 0.51 | NA | NA | NA | **5.8** | ND | NA | NA | NA | NA | NA |
| **GP-5** | 2/4/2014 | CCP | 4-6 ft | NA | NA | **72** | **2,800** | NA | NA | ND | NA | ND | 19 | 19 | NA | NA | NA | 9.5 | NA | NA | 0.33 | NA | NA | NA | **2.6** | ND | NA | NA | NA | NA | NA |
| **GP-6** | 2/4/2014 | CCP | 9-11 ft | NA | NA | **65** | **850** | NA | NA | ND | NA | ND | 19 | 19 | NA | NA | NA | 27 | NA | NA | **11** | NA | NA | NA | **4.1** | ND | NA | NA | NA | NA | NA |
| **GP-7** | 2/4/2014 | CCP | 10-12 ft | NA | NA | **55** | **1,700** | NA | NA | ND | NA | ND | 19 | 19 | NA | NA | NA | 11 | NA | NA | 0.26 | NA | NA | NA | **4.3** | ND | NA | NA | NA | NA | NA |
| **GP-8** | 2/4/2014 | CCP | 11-15 ft | NA | NA | **54** | **4,100** | NA | NA | ND | NA | ND | 20 | 20 | NA | NA | NA | 9.2 | NA | NA | 0.29 | NA | NA | NA | **4.5** | ND | NA | NA | NA | NA | NA |
| **GP-11** | 2/4/2014 | CCP | 4-6 ft | NA | NA | **16** | 450 | NA | NA | ND | NA | ND | 16 | 16 | NA | NA | NA | 23 | NA | NA | 0.35 | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA |
| **GP-12** | 2/4/2014 | CCP | 2-4 ft | NA | NA | **52** | **2,000** | NA | NA | ND | NA | ND | 19 | 19 | NA | NA | NA | 14 | NA | NA | 0.28 | NA | NA | NA | 2.1 | ND | NA | NA | NA | NA | NA |
| **SS1** | 2/18/2016 | Soil/CCP | 2-12 in | NA | ND | **6.7** | 210 | 1.2 | ND | ND | NA | NA | NA | 28 | **25** | 47 | NA | 22 | NA | **2,400** | 0.052 | ND | 15 | NA | ND | ND | NA | 120 | **1.3** | **88** | 100 |
| **SS1-Dup [1]** | 2/18/2016 | Soil/CCP | 2-12 in | NA | ND | **8.5** | 260 | 1.4 | ND | ND | NA | NA | NA | 31 | **28** | 56 | NA | 29 | NA | **3,300** | 0.059 | ND | 18 | NA | ND | ND | NA | 150 | **1.7** | **95** | 110 |
| **SS2** | 2/18/2016 | Soil/CCP | 2-12 in | NA | ND | **24** | **830** | 3.5 | ND | ND | NA | NA | NA | 27 | **20** | 57 | NA | 39 | NA | **1,700** | 0.21 | 1.7 | 19 | NA | **2.4** | ND | NA | 190 | **1.2** | **81** | 110 |
| **SS3** | 2/18/2016 | Soil | 2-12 in | NA | ND | **4.5** | 100 | 0.80 | ND | ND | NA | NA | NA | 13 | **6.8** | 22 | NA | 14 | NA | **240** | 0.048 | ND | 5.3 | NA | ND | ND | NA | 36 | ND | **41** | 28 |
| **SS4** | 2/18/2016 | Soil | 2-12 in | NA | ND | **8.5** | 380 | 1.2 | ND | ND | NA | NA | NA | 22 | **12** | 29 | NA | 25 | NA | **910** | 0.061 | ND | 12 | NA | ND | ND | NA | 51 | ND | **54** | 51 |
| **SS5** | 2/18/2016 | Soil | 2-12 in | NA | ND | 4.8 | 130 | 0.89 | ND | ND | NA | NA | NA | 17 | **9.4** | 25 | NA | 27 | NA | **460** | 0.091 | ND | 7.9 | NA | ND | ND | NA | 43 | ND | **47** | 48 |
| **SS6** | 2/18/2016 | Soil | 2-12 in | NA | ND | 3.1 | 82 | 0.70 | ND | ND | NA | NA | NA | 35 | **7.6** | 23 | NA | 17 | NA | **410** | 0.038 | ND | 6.5 | NA | ND | ND | NA | 25 | ND | **45** | 43 |
| **SS7** | 2/18/2016 | Soil | 2-12 in | NA | ND | 3.1 | 84 | 0.60 | ND | ND | NA | NA | NA | 14 | **6.9** | 15 | NA | 13 | NA | **500** | 0.038 | ND | 5.9 | NA | ND | ND | NA | 31 | ND | **37** | 37 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **PSRG - Protection of Groundwater** | | | | NS | 0.9 | 5.8 | 580 | 63 | 45 | 3.0 | NS | 3.8 | 360,000 | NS | 0.9 | 700 | 150 | 270 | NS | 65 | 1 | NS | 130 | NS | 2.1 | 3.4 | NS | NS | 0.28 | 6.0 | 1,200 |
| **PSRG - Residential** | | | | 15,000 | 6.2 | 0.68 | 3,000 | 32 | 3,200 | 14 | NS | 0.3 | 24,000 | NS | 4.6 | 620 | 11,000 | 400 | NS | 360 | 4.6 | 78 | 300.0 | NS | 78 | 78 | NS | 9,400 | 0.156 | 78 | 4,600 |
| **PSRG - Industrial** | | | | 100,000 | 94 | 3.0 | 44,000 | 460 | 46,000 | 200 | NS | 6.3 | 100,000 | NS | 70 | 9,400 | 100,000 | 800 | NS | 5,200 | 70 | 1,200 | 4,400 | NS | 1,200 | 1,200 | NS | 100,000 | 2.4 | 1,160 | 70,000 |

**Notes:**
All results in mg/kg
PSRG - Preliminary Soil Remediation Goal
**Bold** denotes concentration above protection of groundwater PSRG
Blue shading indicates concentration above residential PSRG
Green shading indicates concentration above industrial PSRG
ND - Not Detected; NA - Not Analyzed; NS - Not Specified
[1] denotes duplicate sample taken
**Analytical Methods**
Metals by EPA Method 6010C
Hexavlent Chromium by EPA Method 7196A
Mercury by EPA Method 7471B

**Table 4B (page 1 of 1)**
**Soil and CCP Analytical Data - SVOCs, VOCs, TPH, VPH/EPH, Pesticides, and PCBs**
**Chapel Hill Police Department**
**Chapel Hill, North Carolina**
**H&H Job No. TCH-002**

| Sample ID | Sample Date | Material Sampled (Soil or CCP) | Depth (ft) | SVOCs | VOCs | | | TPH GRO/DRO | | VPH/EPH | | Pesticides | PCBs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Benzoic acid | 4-Isopropyltoluene | Acetone | Methyl Ethyl Ketone (2-Butanone) | TPH-GRO | TPH-DRO | VPH | EPH | Toxaphene | PCBs |
| **S-1** | 4/29/2013 | Soil | 15 | NA | NA | NA | NA | ND | 8.0 | NA | NA | NA | NA |
| **S-4** | 4/29/2013 | CCP | 1 | 0.39 | ND | ND | ND | ND | **27** | ND | ND | NA | NA |
| **S-5** | 1/31/2014 | CCP | 0-4 | ND | 0.051 | 0.14 | ND | NA | NA | NA | NA | ND | ND |
| **S-6** | 1/31/2014 | CCP | 0-4 | ND | ND | 0.17 | 0.0086 | NA | NA | NA | NA | ND | ND |
| **S-7** | 1/31/2014 | CCP | 0-4 | ND | 0.024 | 0.11 | ND | NA | NA | NA | NA | **0.17** | ND |
| **PSRG - Protection of Groundwater** | | | | 130 | NS | 24 | 16 | -- | -- | -- | -- | 0.046 | 0.1 |
| **PSRG - Residential** | | | | 50,000 | NS | 12,000 | 5,400 | -- | -- | -- | -- | 0.49 | NS |
| **PSRG - Industrial** | | | | 100,000 | NS | 100,000 | 38,000 | -- | -- | -- | -- | 2.1 | NS |
| **DEQ UST Section Action Level** | | | | -- | -- | -- | -- | 10 | 10 | -- | -- | NS | NS |

**Notes:**
All results in mg/kg
PSRG - Preliminary Soil Remediation Goal
UST = Underground Storage Tank
**Bold** denotes above the protection of groundwater PSRG or UST Section action level
Blue shading indicates concentration above residential PSRG
Green shading indicates concentration above industrial PSRG
ND - Not Detected; NA - Not Analyzed; NS - Not Specified
**Analytical Methods**
SVOCs = Semi-Volatile Organic Compounds by EPA Method 8270
VOCs = Volatile Organic Compounds by EPA Method 8260
TPH-GRO = Total Petroleum Hydrocarbons - Gasoline Range Organics by EPA Method 8015C
TPH-DRO = Total Petroleum Hydrocarbons - Diesel Range Organics Method 8015C
EPH = Extractable Petroleum Hydrocarbons by MADEP Method; VPH = Volatile Petroleum Hydrocarbons by MADEP Method
MADEP = Massachusetts Department of Environmental Protection
PCBs = Polychlorinated Biphenyls




N

APPROXIMATE

0 2000 4000

SCALE IN FEET

U.S.G.S. QUADRANGLE MAP

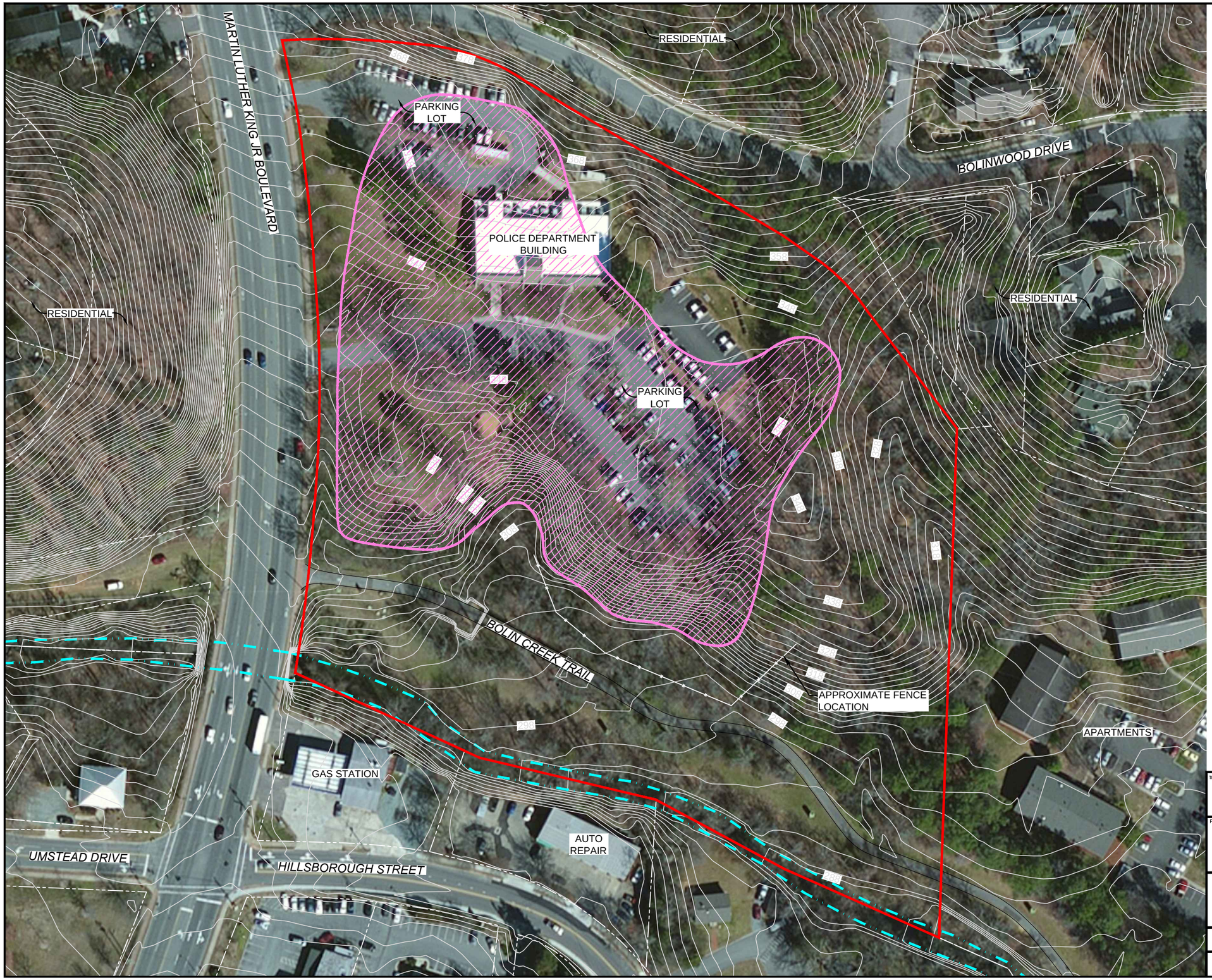
**CHAPEL HILL, NORTH CAROLINA, 2002**

QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

| | |
|---|---|
| TITLE | **SITE LOCATION MAP** |
| PROJECT | TOWN OF CHAPEL HILL<br>POLICE DEPARTMENT PROPERTY<br>CHAPEL HILL, NORTH CAROLINA |

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007 (p) 704-586-0373 (f)

| | | | |
|---|---|---|---|
| DATE: | 7-8-16 | REVISION NO: | 0 |
| JOB NO: | TCH-002 | FIGURE: | 1 |




LEGEND

- SITE PROPERTY BOUNDARY
- BOLIN CREEK
- 101 TOPOGRAPHIC CONTOUR ELEVATION (FT MSL)
- PRIMARY AREA OF CCP BASED ON PREVIOUS ASSESSMENT & TOPOGRAPHY

N

APPROXIMATE
0 100 200
SCALE IN FEET

TITLE

SITE MAP

PROJECT

TOWN OF CHAPEL HILL
POLICE DEPARTMENT PROPERTY
CHAPEL HILL, NORTH CAROLINA

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SMARTER ENVIRONMENTAL SOLUTIONS
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Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

| | |
|---|---|
| DATE: 7-8-16 | REVISION NO. 0 |
| JOB NO. TCH-002 | FIGURE NO. 2 |


LEGEND

- SITE PROPERTY BOUNDARY
- BOLIN CREEK
- 101 TOPOGRAPHIC CONTOUR ELEVATION (FT MSL)
- PRIMARY AREA OF CCP BASED ON PREVIOUS ASSESSMENT & TOPOGRAPHY
- MONITORING WELL LOCATION (FALCON ENGINEERING)
- TEMPORARY MONITORING WELL LOCATION (FALCON ENGINEERING)
- SOIL BORING LOCATION (FALCON ENGINEERING)
- SURFACE WATER SAMPLE LOCATION (FALCON ENGINEERING)
- ABANDONED MONITORING WELL LOCATION

N

APPROXIMATE
0 100 200
SCALE IN FEET

TITLE

# PREVIOUS SAMPLE LOCATION MAP

PROJECT

TOWN OF CHAPEL HILL
POLICE DEPARTMENT PROPERTY
CHAPEL HILL, NORTH CAROLINA

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SMARTER ENVIRONMENTAL SOLUTIONS
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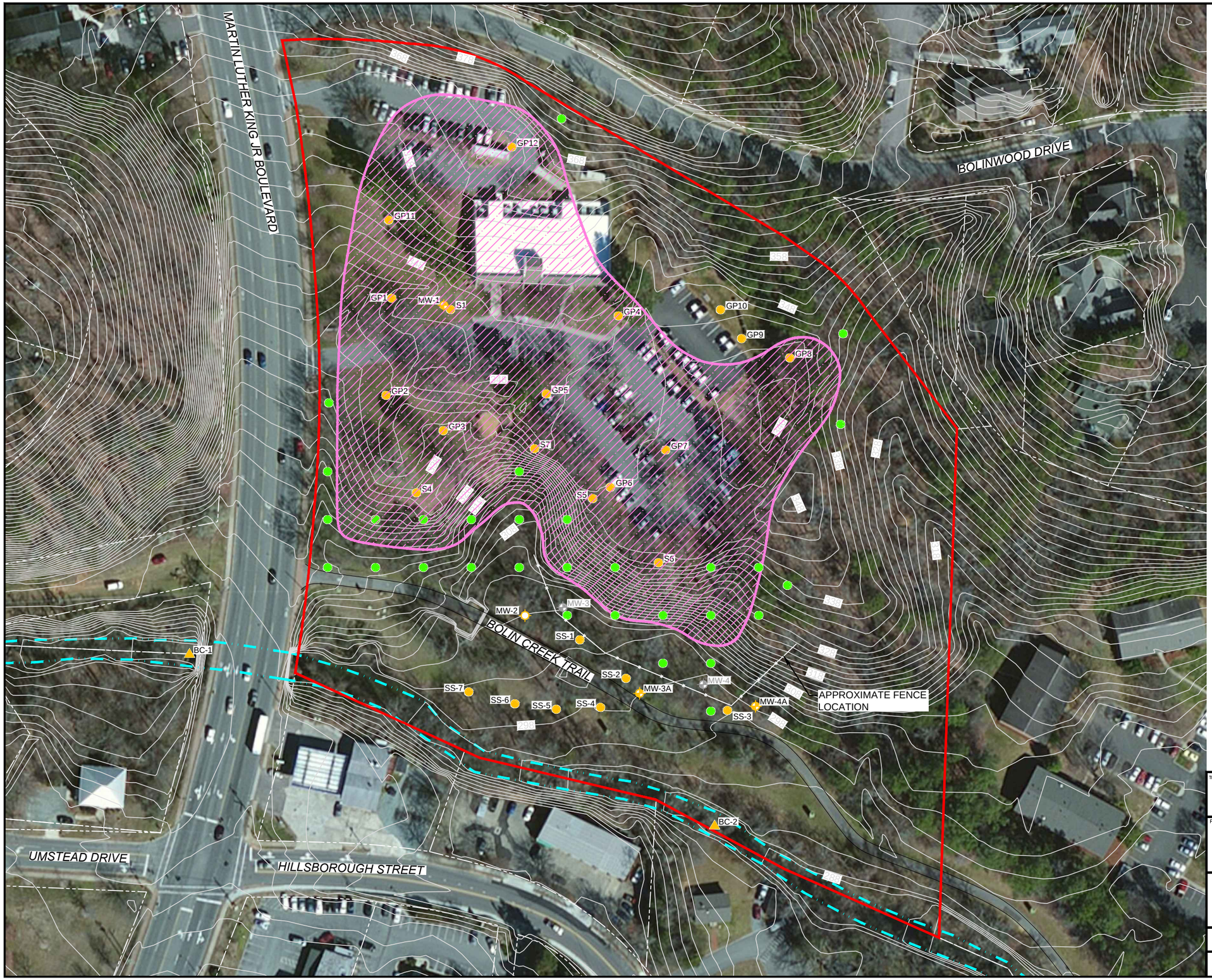
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

| | |
|---|---|
| DATE: 7-8-16 | REVISION NO. 0 |
| JOB NO. TCH-002 | FIGURE NO. 3 |




LEGEND

- SITE PROPERTY BOUNDARY
- BOLIN CREEK
- 101 TOPOGRAPHIC CONTOUR ELEVATION (FT MSL)
- PRIMARY AREA OF CCP BASED ON PREVIOUS ASSESSMENT & TOPOGRAPHY
- MONITORING WELL LOCATION (FALCON ENGINEERING)
- TEMPORARY MONITORING WELL LOCATION (FALCON ENGINEERING)
- SOIL BORING LOCATION (FALCON ENGINEERING)
- SURFACE WATER SAMPLE LOCATION (FALCON ENGINEERING)
- PROPOSED CCP COVER INVESTIGATION SAMPLE LOCATION

N

APPROXIMATE
0 100 200
SCALE IN FEET

TITLE

# PROPOSED CCP COVER INVESTIGATION BORING MAP

PROJECT

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POLICE DEPARTMENT PROPERTY
CHAPEL HILL, NORTH CAROLINA

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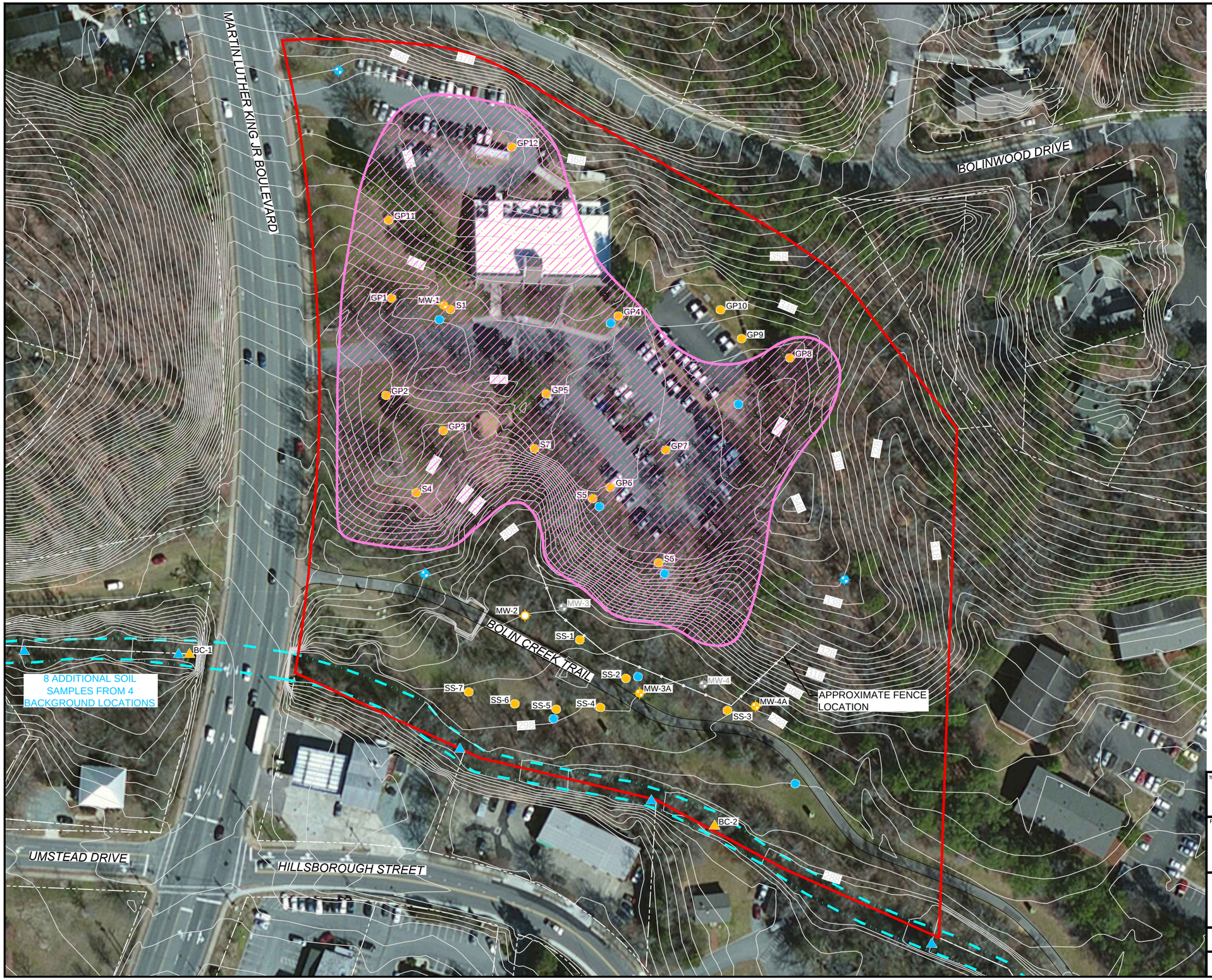
|---|---|
| DATE: 7-8-16 | REVISION NO. 0 |
| JOB NO. TCH-002 | FIGURE NO. 4 |




LEGEND

- SITE PROPERTY BOUNDARY
- BOLIN CREEK
- TOPOGRAPHIC CONTOUR ELEVATION (FT MSL)
- PRIMARY AREA OF CCP BASED ON PREVIOUS ASSESSMENT & TOPOGRAPHY
- MONITORING WELL LOCATION (FALCON ENGINEERING)
- TEMPORARY MONITORING WELL LOCATION (FALCON ENGINEERING)
- SOIL BORING LOCATION (FALCON ENGINEERING)
- SURFACE WATER SAMPLE LOCATION (FALCON ENGINEERING)
- ABANDONED MONITORING WELL LOCATION
- PROPOSED MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED SURFACE WATER/ SEDIMENT SAMPLE LOCATION

N

APPROXIMATE
0 100 200
SCALE IN FEET

TITLE

# PROPOSED ADDITIONAL SAMPLE LOCATION MAP

PROJECT

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| JOB NO. TCH-002 | FIGURE NO. 5 |