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North Carolina Department of Environment and Natural Resources
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December 21, 2011

Sent Via E-mail

Mr. Bruce Hickman
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Subject: Soil Management Plan Approval
Charlotte Chemical Laboratory Site
Charlotte, Mecklenburg County
Brownfields Project Number 11045-07-60

Dear Mr. Hickmas:

On December 20, 2011, the North Carolina Department of Environmental and Natural Resources (DENR) Brownfields Program received the revised Soil Management Plan Rev 1 prepared by Hart & Hickman for the above referenced brownfields property. This document was submitted in accordance with the Notice of Brownfields Property recorded on November 23, 2010. The Soil Management Plan for the Water Line Project is approved.

Be advised that this approval from the Brownfields Program does not waive any applicable requirement to obtain any necessary permits, licenses or certifications for the above listed activities nor does it waive any requirement to comply with applicable law for such activities. If you have questions about this correspondence or require additional information, please feel free to contact me by phone at 704/661-0330, or by e-mail at carolyn.minnich@ncdenr.gov.

Sincerely,

Carolyn Minnich

Carolyn Minnich
Brownfields Project Manager
Division of Waste Management

cc: Project File
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Soil Management Plan
Water Line Project
1200 South Boulevard
Charlotte Chemical Laboratory Site
Charlotte, North Carolina

H&H Job No. SBL-002

December 15, 2011

Revision 1



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#C-1269 Engineering
#C-245 Geology

**Soil Management Plan
Water Line Project
1200 South Boulevard
Charlotte Chemical Laboratory Site
Charlotte, North Carolina
H&H Job No. SBL-002**

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Soil Management Plan
Water Line Project
1200 South Boulevard
Charlotte Chemical Laboratory Site
Charlotte, North Carolina
H&H Job No. SBL-002

1.0 INTRODUCTION

This Soil Management Plan (SMP) presents actions which may be necessary for installation and removal of water mains and other utilities in the northern portion of the 3.15-acre Charlotte Chemical Laboratory Site (former Simpson's Lighting property) located at 1112 and 1200 South Boulevard in Charlotte, Mecklenburg County, North Carolina (subject property, Figure 1). The subject parcel is currently improved with a 15,860-square ft two-story commercial showroom/warehouse, a parking area, and grass-covered land (Figure 2). The property is being redeveloped for mixed commercial and multi-family residential use and a water main and other utilities are being realigned prior to redevelopment. According to Mr. Randy Martin with RKM Resources, PLLC (RKM), the existing water lines along East Palmer Street (Figure 2) will be removed at the time the new water main is installed.

This SMP is specifically written to address installation of the water main (and other utilities) which traverses a distance of approximately 130 ft across the northern corner of the property and a distance of approximately 140 ft in the portion of East Carson Boulevard that is part of the Brownfields property, as well as the removal of approximately 300 ft of existing water main along East Palmer Street (Figure 2). Site conditions and assessment findings for the entire property are presented in this SMP for purposes of providing complete information. Conditions in the northern portion of the property at the location of the new utility alignment and existing water line removal are summarized in Section 3.0. Soil management plans for the water main realignment and relocation of other utilities, provided in the context of work being performed under the

existing North Carolina Department of Environment and Natural Resources (DENR) Notice of Brownfields Property, are presented in Section 5.0.

The NC DENR Notice of Brownfields Property (NBP) was executed on November 23, 2010 with the prospective developer 1200 South Boulevard, LLC (the Prospective Developer). The actions described in this SMP will be completed under the NBP by the prospective developer at the time that the subject utility installation occurs.

2.0 ENVIRONMENTAL ACTION OBJECTIVES

The Brownfield Agreement for the subject property limits the land use of the property to a number of uses, including multi-family residential and commercial use. Actions described in this plan account for a range of site conditions that may arise during utility relocation and may be modified by the Prospective Developer and DENR as the project progresses to accommodate the final utility installation design and conditions encountered in the field.

Actions described in this SMP are intended to provide conditions on the property at the locations of the water main and other utility installation and removal which are adequately protective of site construction / utility workers and future site users, with regard to the following potential exposure risks:

- Exposure to contaminated soil – dermal contact; ingestion; inhalation of contaminated dust; or inhalation of vapors from volatile organic compounds (VOCs) in soil intruding into the utility excavation and work areas.
- Exposure to contaminated groundwater – dermal contact; ingestion; or inhalation of vapors from VOCs in groundwater intruding into the utility excavation and work areas.

3.0 SITE CONDITIONS

3.1 Overview

H&H completed a Phase I Environmental Site Assessment (ESA) at the subject property in October 2007. Findings indicate the subject property was originally developed in the 1920s and has historically been occupied by operations of environmental concern as summarized below. The approximate locations of these potential areas of concern are identified in Figure 2. An excerpt from the 2007 Phase I ESA describing the recognized and historical environmental concerns for the property is provided in Appendix A.

- Former Filling Station – operated in the southeastern portion of the property (along South Boulevard) during the 1950s and the 1960s;
- Former Oil Storage Warehouses – operated at two locations in the southwestern and central portions of the property from the 1930s until the 1950s;
- Former Charlotte Chemical Test Laboratory – operated at two locations in the central and western portions of the property from the 1920s until the 1950s; and
- Former Dye House – operated in the northwestern portion of the property in the 1950s.
- UST Incident - A 2,000-gallon gasoline UST, a 2,000-gallon diesel UST, and a 1,000-gallon UST (also identified as a 550-gallon gasoline UST) were removed from the subject property in December 1999. A soil sample collected from the base of the 1,000-gallon gasoline UST excavation, likely at the time of tank removal indicated gasoline range total petroleum hydrocarbons (TPH-GRO) at a concentration of 16,000 parts per million (ppm). DENR issued an Incident #21111 for the reported release below the 1,000-gallon gasoline UST. H&H reviewed the DENR UST database for this incident which indicated that impacted soils were removed and groundwater

was not impacted. The incident received a notice of no further action in October 2000.

- Although not identified as an REC during the 2007 Phase I ESA, American Dry Cleaner was identified approximately 600 ft northeast of the subject site at the address 300 East Morehead Street. During the 2007 Phase I ESA, this facility was judged to be low risk because 1) H&H did not observe monitoring wells on the property located between the site and dry cleaner and 2) PCE was not detected in groundwater at the subject Charlotte Chemical Laboratory site during the Phase II ESA. H&H revisited information regarding American Dry Cleaners in preparation of this SMP, and found that a dry cleaner called American Dry Cleaning Company was identified in the North Carolina Dry Cleaning Solvent Cleanup Act (DSCA) program at the address 309 East Morehead Street, approximately 740 ft northeast of the site. H&H believes this to be the site of the former dry cleaner identified in the 2007 EDR report. Based on topographic gradient in the vicinity of 309 East Morehead Street, the groundwater flow direction would be toward the northeast and away from the subject site. In addition, PCE was not detected in groundwater samples collected at the Charlotte Chemical Laboratory site in 2007 or 2008. Because of the topographic gradient and the lack of PCE identified in groundwater samples at the Charlotte Chemical Laboratory site, the potential for impact to the subject Charlotte Chemical Laboratory site from the dry cleaning site is judged to be low.

Based on the Phase I ESA findings and the clarification on the dry cleaning site described above, no suspected sources of groundwater impacts were identified upgradient of the northern portion of the property where the water main and other utilities are being installed.

3.2 2007 Phase II ESA

Based on the 2007 Phase I ESA findings, H&H conducted Phase II ESA soil and groundwater sampling activities to assess the potential areas of concern at the subject Charlotte Chemical Laboratory site. Excerpted tables and figures from the 2007 Phase II report summarizing the key results are provided in Appendix A. Results of this assessment pertinent to the utility installation and removal activities at the subject property are summarized below.

Because no historical operations of concern are known to have operated in the northern portion of the property where the water main and other utilities are to be installed, no soil assessment was conducted specifically in this area. Minor soil impacts were detected in the 2007 assessment (see excerpted Table 1 in Appendix A) at concentrations that exceeded regulatory screening levels at the following locations:

- 1) Near the two former oil storage structures previously located in the southwestern and central portions of the site (PAHs and Oil& Grease); and
- 2) Near the former Charlotte Chemical Laboratory building located in the western portion of the property (chlorobenzene and 1,4 dichlorobenzene).

No soil impacts above screening levels were identified in the area of the former Service Station or the former Dye House.

Based on water table elevations measured as part of Phase II assessment activities, groundwater is present at a depth of approximately 12 to 24 ft below ground surface and was estimated to flow in a south-southwest direction (Figure 2, Appendix A). Because no historical operations of concern are known to have operated in the northern portion of the property where the water main and other utilities are to be installed, no groundwater assessment was conducted in this area as part of this 2007 assessment. Minor

groundwater impacts above North Carolina 15A NCAC 02L Groundwater Quality Standards (2L Groundwater Standards, see excerpted Table 2 in Appendix A) were detected at the following three locations on the property:

- 1) Downgradient of the former Oil Storage building located in the western portion of the site (naphthalene);
- 2) Downgradient of the former Charlotte Chemical Laboratory building located in the western portion of the site (1,2 dichlorobenzene and 1,4 dichlorobenzene); and
- 3) Downgradient of the former Dye House located in the northwestern portion of the site (di-isopropyl ether and cadmium).

Importantly, these minor impacts to groundwater are downgradient of the northern portion of the property where the water main and other utilities are being realigned. No groundwater impacts were identified above standards in the area of the former Service Station located in the eastern portion of the property.

3.3 2008 Brownfield Assessment Activities

In 2008 H&H conducted additional Brownfield assessment activities as requested by DENR. Excerpted tables and figures from the 2008 Brownfield assessment summarizing the key results are provided in Appendix B. Based upon the results of the 2007 Phase II ESA assessment activities and the 2008 Brownfields assessment activities, results pertinent to the utility installation at the subject property are noted below.

- The soil sample (SB-12) collected in the northern corner of the property in proximity to where the water main and other utilities are being installed was non-

detect for VOCs and semi-volatile organic compounds (SVOCs), and metals concentrations were below DENR Soil Remedial Goals (SRGs).

- The soil composite sample (Comp #4) in the northern corner of the property in proximity to where the water main and other utilities are being installed was non-detect for poly-chlorinated biphenyls (PCBs). No other analyses were conducted on this sample.
- Soil concentrations above DENR SRGs are limited to the western portion of the site in the area of the former Dye House, the former western Charlotte Chemical Laboratory structure, and the former Oil House. None of these impacted areas are in proximity to the northern portion of the property where the water main and other utilities are being realigned.
- The groundwater sample (GTW-5) collected in proximity and downgradient of the location where the water main and other utilities are being realigned was non-detect for VOCs. The groundwater sample (TMW-11) collected approximately 25 ft hydraulically downgradient of the waterline removal area was non-detect for VOCs, SVOCs, and PCBs.
- Only minor concentrations of volatile compounds were detected elsewhere in shallow groundwater at the site. The location of these groundwater VOC impacts is 240 ft downgradient of the removal of the water main and other utilities at the property. Further, these detected VOC concentrations are below DENR Inactive Hazardous Sites Branch (IHSB) Industrial/Commercial Vapor Intrusion Screening Levels (August 2011), with the exception of 1,2,4-trichlorobezene (30.7 µg/L) in TMW-5 which was detected only slightly above its Industrial/Commercial Vapor Intrusion Screening Level of 30 µg/L.

3.4 Brownfields Receptor Survey

The Brownfields receptor survey form and associated table and figures completed as part of the 2008 Brownfields assessment activities are attached as Appendix B. The receptor survey findings as they relate to the utility realignment are summarized below:

- Surrounding properties in proximity to the utility installation location at the site consist of retail, surface parking, office, and multi-family residential. The residential units are located approximately 110 ft hydraulically cross to upgradient of the utility realignment and are comprised of apartment units constructed on slab.
- Potential on-site receptors include an existing basement below the Simpson's Lighting building and storm sewers located in the western portion of the property. In addition a 54-inch water main line and an eight-inch water line are present along East Palmer Street in the central portion of the property, which are being removed as part of this realignment
- Potential off-site receptors identified near the subject property include buried sanitary sewer, water, and natural gas lines along South Boulevard, and buried fiber optic cable and electric lines along the Charlotte Area Transit System (CATS) light rail line and East Palmer Street, respectively.
- Pritchard Memorial Baptist Church operates a Child Development Center (daycare facility) at a location approximately 400 ft south of the subject site.
- Charlotte Mecklenburg Utilities (CMU) provides water and sewer service to the subject property via buried lines. The source of potable water is Mountain Island Lake located approximately 10.5 miles north-northwest of the subject site.

- Five geo-thermal water supply wells exist on the subject property. At the time of the Brownfields receptor survey, no information regarding the geothermal wells was available. However, H&H later found that the geothermal wells were six inch diameter wells ranging in depth from 312 ft to 560 ft deep. No public water supply wells or irrigation wells were identified in the vicinity of the subject property. The Mecklenburg County Water Supply Well Information website also depicted monitoring wells on the adjacent property southwest of the subject site on property currently occupied by a residential hi-rise condominium tower.
- No water bodies or wetlands are present on the subject property. No water bodies were identified within 500 ft of the subject property.

3.5 2011 Assessment Conducted by Others

Additional Phase II soil and groundwater assessment was conducted by others in July 2011. Although the written report was not available to H&H in preparing this SMP, a draft figure depicting sample locations and draft tables of analytical results are provided in Appendix C. Results pertinent to the water main installation the northern portion of the property are provided below.

- Four soil samples collected in the northern corner of the property and in proximity to the proposed utility alignment (SB-21, SB-22, SB-27, and SB-29) were non-detect for VOCs except for one acetone detection (a common laboratory contaminant, detected at a concentration five orders of magnitude below DENR's residential SRG). No SVOCs were detected in soil borings SB-22, SB-27, or SB-29. Detections of benzo(b)fluoranthene, chrysene, fluoranthene, and pyrene were identified in SB-21 at concentrations orders of magnitude below DENR residential SRGs. Metals were not identified at concentrations exceeding DENR's Residential SRGs except for several detections of arsenic and one detection of thallium. Of these detections, only arsenic detected in SB-21 (2.1

mg/kg) exceeded the DENR Industrial SRG. However, this concentration is within in the range of typical background concentrations for arsenic, therefore it is not judged to pose a risk to site workers.

- Five soil samples collected along East Palmer Street and in proximity to the water line removal (SB-23, SB-24, SB-25, SB-26, and SB-28) were non-detect for VOCs and SVOCs. Metals concentrations were below DENR residential SRGs, except for one detection of arsenic. However, this detection of arsenic (SB-24, 0.66 mg/kg) was below its DENR Industrial SRG and within typical background concentrations for arsenic, therefore it is not judged to pose a risk to site workers.
- Two groundwater samples (SB-26 and SB-27) collected in proximity and hydraulically downgradient of the utility realignment location were non-detect for VOCs.
- Four groundwater samples (SB-23, SB-24, SB-25, and SB-26) collected in proximity to the water main removal location. Except for the sample from SB-26, the groundwater samples all contained chloroform (2.1 to 12.6 µg/L) below 2L Groundwater Standards. These concentrations are also below the IHSB Industrial/Commercial Vapor Intrusion Screening Level of 35 µg/L. No other VOCs were detected. Chloroform is commonly associated with municipal water chlorination. Based on the frequency and magnitude of the detections, it appears likely that the chloroform in these samples is associated with the transmission of treated potable water across the property.

3.6 Summary of Redevelopment Considerations

H&H reviewed conceptual drawings depicting the proposed utility realignment for the northern portion of the subject property (Figure 2). Based on this plan, the new water main to be installed traverses a distance of approximately 130 ft diagonally across the northern corner of the property and then continues southeastward on an alignment within

East Carson Boulevard. Once on East Carson Boulevard, it proceeds approximately 140 feet (largely on property that is within East Carson Boulevard but that is part of the Brownfields property). The alignment then continues outside the property limits. Other utilities may run in the same or a roughly similar alignment as the water main. The existing water lines to be removed traverse a distance of approximately 300 ft to the southeast along East Palmer Street. Previous assessment findings indicate the following conditions pertinent to the subject utility installation and removal activities at the property:

- Historical records review from the 2007 Phase I ESA indicates the northern portion of the property was not used for operations of environmental concern. No VOC or SVOC soil impacts were detected in any of eleven soil sample locations situated in proximity to the northern portion of the property, with the exception of one minor acetone detection suspected to be a laboratory-induced contaminant and a few minor detections of select SVOCs below DENR Industrial SRGs. Metals detections were all below DENR Industrial SRGs, with the exception of a minor detection of arsenic in one sample at a concentration within the range of typical background concentrations. Because the East Carson Boulevard right-of-way has been historically developed with a roadway, no soil impacts are expected in this portion of the project.
- Areas of soil impact above DENR SRGs are 155 to 230 ft away from the location of the realignment and are not judged to pose ingestion, dermal contact, dust inhalation, or vapor inhalation concern for utility workers during line installation and removal activities. Appropriate worker safety and work zone demarcation measures should be taken to mitigate worker contact with contaminated soils outside the installation area.
- Groundwater occurs at a depth of 12 ft to 24 ft below ground surface, it is not expected that utility workers will encounter groundwater during realignment activities. In addition, VOCs were not detected in seven groundwater samples

collected in proximity to the subject work areas, with the exception of detections chloroform below DENR 2L standards. Appropriate measures should be taken to ensure the excavation integrity and worker safety as it relates to excavations in proximity to groundwater.

- Groundwater is estimated to flow in a south-southwest direction at the property. No suspected sources of groundwater impacts were identified upgradient of the northern portion of the property where the utility construction and removal is being performed.
- Areas of groundwater impact are 240 to 320 ft hydraulically downgradient of the location of the utility installation and are not judged to pose an ingestion, dermal contact, dust inhalation, or vapor inhalation concern for utility workers during line installation. Appropriate worker safety and work zone demarcation measures should be taken to mitigate worker contact with contaminated groundwater outside the utility installation area.
- There are no known or suspected USTs in the vicinity of the utility installation area at the site. The closest suspected UST is approximately 130 ft hydraulically downgradient of the water main removal.
- A 1,000-gallon UST (also identified as a 550-gallon gasoline UST) believed to have been located approximately 35 ft downgradient of the existing water line was removed from the subject property in December 1999. DENR issued an Incident #21111 for the reported release below the 1,000-gallon gasoline UST. The current DENR UST database for this incident indicates impacted soils were removed and groundwater was not impacted and the incident received a Notice of No Further Action in October 2000. Available data, including SB-26 collected in 2011 and SB-11/TMW-11 collected in 2008, in the vicinity of this UST indicate no VOCs or SVOCs detected. Based on the information provided in the DENR UST database and the more recent samples collected near this former UST, it appears that impacts in the vicinity of the UST have been mitigated. Although it

is possible that impacts remain in the UST basin, it appears unlikely that these impacts will be encountered during removal of the existing water line.

- The presence of other utilities at the site may provide preferential pathways for contaminant migration. Special attention should be given to locations where the new excavation may intercept an existing utility corridor that is in contact or close proximity with contaminated soil or groundwater at the property.
- The subject property and the surrounding area are served by Charlotte Mecklenburg Utilities water service and there are no potable water groundwater users in the vicinity of the subject property. In addition, groundwater use is restricted at the property as part of the NBP. It is not known if the existing geothermal wells at the site will remain in service for the future development, but their future operation does not influence decision-making related to the water main and other utility installation.
- *By virtue of the presence of environmental impacts at the property, work conducted within areas of known impacts should take into consideration the health and safety precautions necessary for safe execution of the utility installation and removal activities. The chosen contractor should be required to provide a Health & Safety Plan to inform and ensure the safety of workers in areas of potential impacts. An example Health and Safety Plan, similar to what will be used by the environmental consultant overseeing the work, is provided in Appendix D.*

4.0 ENVIRONMENTAL GOALS

As explained in this SMP, abundant available data indicate impacted soil and groundwater will not be encountered during installation of the water main or any other of the potential utilities to be installed. In the event that impacts are encountered, the remedial goals below will be applied in considering the appropriate corrective actions to be taken during or subsequent to installation.

4.1 Remedial Goals for Soil

In general, the preliminary soil remedial goals will be the NC DENR Inactive Hazardous Sites Branch Preliminary *Residential* Health-Based Soil Remediation Goals (SRGs), except in portions of the project area where Prospective Developer knows that final grade for the proposed development of the property will *not* be exposed to potential residential users. Metal concentrations detected in soil and groundwater samples will also be compared to published naturally-occurring values to determine if a release has occurred. *Following the conclusion of construction and related soil disturbance, but prior to non-construction worker occupation of the site, surficial soils shall be sampled. Refer to Section 5 for more details.*

4.2 Remedial Goals for Groundwater

If groundwater is encountered during utility installation or removal at the subject property and is suspected to be contaminated, samples will be collected and compared to 2L groundwater standards. Groundwater VOC concentrations (if detected) will be compared to the values provided in the IHSB *-Residential* Vapor Intrusion Screening Table to determine if vapor intrusion is a potential risk to construction workers and future site structures. If determined to be necessary due to currently unforeseen conditions, site-specific risk-based screening criteria for groundwater may be developed.

There are no identified groundwater impacts in close proximity to the utility installation or removal area. There are no groundwater receptors in the site area, municipal water is available in the site area, and groundwater is not proposed to be utilized in the future. Accordingly, environmental action is not specified for groundwater beyond restrictions on the use of groundwater at the subject property.

4.3 Underground Storage Tanks (USTs)

Former USTs were identified at the subject site as part of the previous assessments. Only one UST, a former 1000-gallon gasoline UST removed in 1999, is judged to be pertinent to the utility installation and removal activities. A soil sample collected from the base of the 1,000-gallon gasoline UST excavation, likely collected at the time of tank removal, indicated gasoline range total petroleum hydrocarbons (TPH-GRO) at a concentration of 16,000 parts per million (ppm). DENR issued an Incident #21111 for the reported release below the 1,000-gallon gasoline UST. Current DENR status indicates that impacted soils were removed and groundwater was not impacted. The incident received a Notice of No Further Action in October 2000. Two soil borings and one groundwater sample collected in the vicinity of this former tank collected during the 2008 and 2011 site assessments described in this SMP do not indicate residual petroleum impacts.

For the reasons noted above, impacts associated with USTs are not expected to be encountered in the vicinity of the utility removal and realignment at the site. In the event that impacts uniquely associated with a UST release are found to be present in the area of the utility installation or removal, they will be addressed as required by DENR's Brownfield and UST Sections.

5.0 PROPOSED ENVIRONMENTAL ACTIONS

5.1 Environmental Action Criteria

Realignment of the water main and other utilities at the subject property will predominately include installation of security and work zone controls; excavation of soil along the designated alignment; removal or relocation of existing utilities that may interfere with installation; installation of the water main and other utilities, removal of the existing water main; and backfilling and earthwork to achieve the desired final grade. Based on an approximate 270 ft long section of water main installed on the subject property, excavated to a width of 8 ft and a depth of 10 ft, approximately 800 cubic yards of soil may need to be excavated on the subject property to allow for construction of the new water main and other utilities. Based on an approximate 300 ft long section of existing water main to be removed along East Palmer Street, excavated to a width of 8 ft and a depth of 10 ft, approximately 900 cubic yards of soil may need to be excavated on the subject property to remove the existing water line.

As explained in this SMP, abundant available data indicate impacted soil and groundwater will not be encountered during installation of the new water main and other utilities. As also explained in this SMP, impacts are not expected to be encountered during removal of the existing water main.

In the event that impacts are encountered during water main or other utility installation or removal activities, and are confirmed to exceed agreed upon remedial goals, the criteria noted in Section 4.0 and below will be used to direct environmental actions to be taken during or subsequent to installation.

1. The Prospective Developer will backfill the new trench with soil removed from the excavation and/or imported clean fill from an off-site source. *Imported fill will be*

subjected to testing as agreed with DENR to confirm it is below residential remedial goals. On-site fill will be confirmed to meet residential remedial goals to the extent required in Item 8 below. By electing to backfill the new trench with clean fill, the Prospective Developer can eliminate the need for notification during post-development utility work in the subject trench. If soil excavated during installation or removal is suspected to be contaminated, it will be managed as described below.

2. Soil excavated as part of removing the existing water main or other utilities may be placed back in the same excavation or *as approved by DENR* elsewhere at the site. In the event that contamination is suspected in this soil, it will be managed as described below.
3. Suspect soil excavated during installation or removal may be stockpiled and covered in a secure area to allow construction to progress while samples are collected and analyzed, and results evaluated to determine the appropriate disposition of the stockpiled soil. *Stockpiles will be covered with plastic sheeting, configured to minimize contact with surface flow, and additional measures taken as needed to prevent erosion.*
4. If contamination is discovered at the site during installation or removal that is not similar in nature to impacts identified elsewhere at the site during prior assessment activities, the Prospective Developer will contact DENR to discuss the appropriate course of action. Such soil may be stockpiled in a secure area and covered while awaiting characterization. *Stockpiles will be covered with plastic sheeting, configured to minimize contact with surface flow, and additional measures taken as needed to prevent erosion.*
5. If excavation of impacted soils occurs, confirmation sampling will be conducted for purposes of recording areas of impacts remaining at the site. It is anticipated that confirmation samples will be collected at regular intervals along the base and the sidewalls of a given excavation. Base samples will not be collected if the estimated groundwater elevation is within 1.5 ft the excavation floor. Based on the primary

constituents of concern identified at the site, it is likely that any confirmation samples that may be taken will be analyzed for VOCs and PAHs. A confirmatory sampling approach will be discussed with DENR before backfilling an area confirmed during installation to be contaminated.

6. If determined to be *necessary for utility construction and removal purposes*, confirmation samples will be also used to determine the appropriate corrective measure for soil beyond the excavation limits required for water main or other utility installation or removal. Such corrective measures are specified in the items below. In all cases, areas of remaining impacts will be noted on project records.
7. In the unlikely event that the soil impact encountered during installation or removal at the subject property is of the nature that over-excavation is warranted, the over-excavation will proceed only as far as needed to allow construction of the water main and other utilities to continue and/or only as far as needed to allow alternate corrective measures described in this SMP to be taken.
8. Corrective actions will ensure there is a barrier between future site visitors/occupants/workers and soil *within the utility construction and removal excavation alignments* that remains in place at concentrations above the health-based - *residential* remedial goals (Section 4.0).
 - a. The barrier may be a building, paving, hardscape surface, or clean soil/landscaping of a 2 ft minimum thickness.
 - b. *In all areas not covered as stated above in 8.a above, DENR requires post construction sampling and analysis plan to be submitted to DENR. Such sampling and analysis plan may include confirmation that any such fill has no constituent above residential SRGs. This may be completed at the conclusion of redevelopment or phases of redevelopment of the property, which may be performed by a third party.*
9. In preparing the realignment plan and performing installation and removal activities, the following will be considered:

- a) If soil at the site is contaminated above the corresponding remedial goal and can be left in place, it will be covered as described in Item #8 above.
 - b) With DENR's approval, contaminated soil above the corresponding remedial goal can be moved to an alternate on-site location provided the soil is placed under a barrier as described in Item #8 above. Where requested by DENR, existing data or supplemental analyses will be used to confirm the soil to be moved is not characteristically hazardous.
 - c) If soil from an impacted area must be transported offsite, it will be profiled based on existing site data and other analyses as may be required by the disposal facility, and transported to an appropriately permitted facility.
10. When excavation of impacted soil proceeds into an existing City-controlled roadway or utility corridor, but is within or at the bounds of the subject property, actions will be taken to minimize unnecessary disruption of roadway traffic and/or utility service. In such an instance, confirmation sampling and subsequent over-excavation may not be conducted beyond the extent mandated by utility construction needs or beyond the bounds of the subject property. Such conditions will be discussed with DENR should they occur.
11. If a sub-grade feature or pit is encountered during installation and does not require removal for geotechnical or construction purposes, it will be filled with soil or suitable fill and construction will proceed. Where appropriate, the bottom may be penetrated before back filling to prevent fluid accumulation. If the pit has waste in it, the waste may be set aside in a secure area and will be sampled as required by DENR and disposed off-site. If the pit must be removed and the observed waste characteristics indicate the concrete may potentially be contaminated to a significant degree, the concrete will be sampled and analyzed by methods specified by the disposal facility and approved by DENR.

12. If buried piping is encountered and must be removed to allow installation to proceed, the contractor will inspect the pipe for fluids, collect and sample fluids where appropriate, and look for signs of a release using field methods. If a release is suspected, DENR will be contacted to discuss the appropriate course of action.
13. *Excavations will be bermed or covered to minimize run-off in the event of substantial rainfall.* If surface water run-off or groundwater gathers in an open excavation within an area determined during construction to be impacted, appropriate worker safety measures will be undertaken. The accumulated run-off will be allowed to evaporate, used for dust control in areas of known contamination, tested and disposed off-site, or discharged to the City sewer where approved by the City.
14. In the event that impacted soil and/or water within an excavation cannot be dried adequately for construction purposes using the methods described above, the soil may be amended with clean soil, aggregate, drying agents, and/or stabilizing agents to achieve the desired geotechnical qualities. Amendment may be conducted inside or outside the excavation and the material replaced into the excavation. Such amendments will be discussed with DENR in advance.
15. Demolition debris will be segregated as needed, and disposed or recycled at an approved facility, or reused on site as beneficial fill at a location approved by DENR.
16. Potentially contaminated dirt will be shaken off of land clearing debris to the degree practical with land clearing equipment, and the land clearing debris disposed off-site at an approved land clearing and inert debris landfill.
17. *Dust generation will be monitored visually during construction and if observed, dust control measures such as wetting the soils will be implemented.*

Appendix A

2007 Phase I and II ESA (Text, Tables, and Figures)

Appendix B

**2008 Brownfield Assessment Report (Text, Tables, Figures, and Brownfield
Receptor Survey)**

Appendix C

Draft 2011 Phase II ESA Tables and Figure

HEALTH AND SAFETY PLAN
Former Charlotte Chemical Laboratory
1200 South Boulevard
Charlotte, North Carolina
H&H Job No. SBL-002

Site History

The subject parcel is currently improved with a 15,860-square ft two-story commercial showroom/warehouse, a parking area, and grass-covered land. The property is being redeveloped under a North Carolina Department of Environment and Natural Resource (DENR) Brownfield Agreement (BFA) for mixed commercial and multi-family residential use and a water main and other utilities are being realigned prior to redevelopment. According to Mr. Randy Martin with RKM Resources, PLLC (RKM), the existing water lines along East Palmer Street will be removed at the time the new water main is installed. This Health and Safety Plan is being prepared for Hart & Hickman, PC (H&H) personnel for use during oversight of this utility realignment project.

During the 2007 Phase I ESA conducted at the property, several areas of concern were identified including a former filling station, oil storage warehouses, the former Charlotte Chemical Test laboratory, a former dye house, and underground storage tanks. None of these potential environmental sources were located in the portion of the property where the subject waterline installation and removal activities are being conducted. Subsequent Phase II assessment was conducted in 2008 and again in 2011, and included samples in the vicinity of the proposed waterline activities. No VOCs, SVOCs, or PCBs were reported in soil or groundwater samples collected in proximity to the subject waterline work areas. Detections of metals in soil samples were below DENR's Industrial Site Remediation Goals or within regional background ranges. A summary of conditions pertinent to the subject work areas is provided in Attachment 1.

Regarding impacts at the site that are not in close proximity to the subject waterline work areas, no soil impacts above screening levels were identified in the area of the former Service Station or the former dye house. Minor soil impacts were detected in the 2007 assessment at concentrations that exceeded regulatory screening levels at the following locations:

- 1) Near the two former oil storage structures previously located in the southwestern and central portions of the site (PAHs and Oil & Grease);
- 2) Near the former Charlotte Chemical Laboratory building located in the western portion of the property (chlorobenzene and 1,4 dichlorobenzene).

Groundwater is present at a depth of approximately 12 to 24 ft below ground surface and was estimated to flow in a south-southwest direction. No groundwater impacts were identified above standards in the area of the former Service Station located in the eastern portion of the property. Minor groundwater impacts above 2L Groundwater Standards were detected at the following three locations on the property which are not in close proximity to the subject waterline work:

- 1) Downgradient of the former Oil Storage building located in the western portion of the site (naphthalene);
- 2) Downgradient of the former Charlotte Chemical Laboratory building located in the western portion of the site (1,2 dichlorobenzene and 1,4 dichlorobenzene); and
- 3) Downgradient of the former Dye House located in the northwestern portion of the site (diisopropyl ether and cadmium).

Hart & Hickman Scope of Work

The majority of the site work will be conducted by the utility contractor. The scope of work (SOW) for activities to be performed at the site by H&H personnel includes the following:

- H&H will provide periodic construction oversight during the utility realignment work.
- H&H will be on-call during construction activities in case evidence of a release is observed.
- If a potential release is observed, H&H will field screen soils with a photoionization detector (PID) and instruct the removal contractor to segregate suspected impacted soils into a stockpile. Further action will be conducted as outlined in the Soil Management Plan.
- If needed, H&H will supervise excavation activities and/or confirmation soil sampling activities as needed and described in the Soil Management Plan.

Utility Contractor Scope of Work

H&H will provide oversight of the utility contractor as described above. The contractor will operate under a separate HASP. Activities to be performed at the site by the utility contractor include the following tasks:

- installation of security and work zone controls
- excavation of soil along the designated alignment
- removal or relocation of existing utilities that may interfere with installation; installation of the water main and other utilities
- removal of the existing water main
- backfilling and earthwork to achieve the desired final grade.

H&H estimates approximate 270 ft long section of water main installed on the subject property, excavated to a width of 8 ft and a depth of 10 ft, approximately 800 cubic yards of soil may need to be excavated on the subject property to allow for construction of the new water main and other utilities. Based on an approximate 300 ft long section of existing water main to be removed along East Palmer Street, excavated to a width of 8 ft and a depth of 10 ft, approximately 900 cubic yards of soil may need to be excavated on the subject property to remove the existing water line.

Potential Hazards

(1) Physical Hazards

- Being struck or contact with heavy equipment and/or dump trucks.
- Slip, trip, & fall hazards associated with equipment, landscape, and/or open excavations.
- Contact with subgrade utility lines and/or contact with overhead power lines.
- Lifting hazards and pinch points.

(2) Chemical Hazards

Generally, chemical hazards are not suspected to be a concern in the area of the utility realignment. However, volatile organic compounds (VOCs), semi-VOCs (SVOCs), and metals have been detected in other areas of the site.

(3) Biological Hazards (i.e., toxic insects, poisonous plants, and poisonous snakes).

- Biting insects (i.e., mosquitoes, wasps, bees, spiders, and/or fire ants).
- Poison ivy and poison oak.
- Poisonous snakes (copperhead and rattlesnakes are known to inhabit the region).

(4) Other Hazards

- Heat/Cold stress
- Thunderstorms, hail, and lightning.

Training

(1) Minimum Training Required (Review site specific information prior to entering the site).

- 40-hour OSHA HAZWOPER Training
- Medical Monitoring Program Participant
- “Fit for Duty” Clearance from Medical Director and current respirator fit test

(2) Specialized Training or Required Permits

- “Competent Person” training for excavation & trenching preferred but not required for H&H personnel. However, at least one “competent person” as defined by OSHA and provided by the utility contractor shall be on-site during excavation activities.

Emergency Response

(1) On-site emergency contact person and telephone number:

- No on-site contact (vacant facility)
- Mr. Randy Martin, RKM Resources, PLLC (704) 887-4779, mobile (704) 719-6993

(2) Other emergency contacts as appropriate:

- Ambulance, Fire, & Police – phone # 911
- Bruce Hickman PE, Project Manager (704) 887-4600 (office)
- Shannon Cottrill, Health & Safety Officer (704) 577-8810 (cell)
- Joselyn Harriger, Site Safety Officer (704) 577-8809 (cell)

(3) Hospital: Attach Hospital Route Map or Directions

Carolinas Medical Center – 1000 Blythe Boulevard, Charlotte - phone # (704) 355-2000 (**Map Attached**)

In the event of an emergency situation on the site, on-site personnel are to immediately notify the appropriate emergency responder (i.e., fire, rescue, police, etc.), and take any corrective actions or emergency procedures that can be safely performed (i.e., first aid, CPR, etc.) When conditions permit, on-site personnel must notify the H&H Project Manager and Health & Safety Officer that an incident has

occurred. On-site personnel should review and be familiar with the phone number and location of the nearest hospital (listed above).

Personal Protective Equipment (PPE)

- (1) **PPE Required:** (examples: hard hat, safety glasses with side shields, steel toe boots, tyvek coveralls, respirator, rubber boots, gloves, etc.).

The following PPE will be required during the performance of site activities:

Safety glasses	At all times during the performance of site work, regardless of the task
Safety shoes/boots	At all times during the performance of site work, regardless of the task
Traffic safety vest	At all times during the performance of site work, regardless of the task
Hearing Protection	At any time where noise levels are above natural ambient levels, at any time when working within 25 ft of operational heavy equipment (i.e., excavators), and at any time when utilizing portable equipment which creates noise levels above natural ambient levels (i.e., drills, saws, etc)
Leather work gloves	At any time the use of hand protection is warranted, including but not limited to, operations involving the use of hand tools
Nitrile gloves	At any time environmental samples are to be collected or contaminated media is being handled
Hard hat	At any time when working within 25ft of operational heavy equipment and when working within a space with limited overhead clearance and/or overhead obstructions
Tyvek® coveralls	At any time where dermal exposure to contaminants is imminent or assured, or where exposure to liquid or solid wastes is likely. The use of Tyvek® coveralls may require the modification of the PPE level established for the site
Respirator	At any time when volatile organic vapor measurements indicate levels at or in excess of the action level established for the site (see Exposure Monitoring below). When used, the appropriate respirator cartridge must be used (i.e., organic vapor). Consultation with the Project Manager and Health & Safety Officer is <u>required</u> prior to the use of a respirator.

Exposure Monitoring

On an as needed basis during excavation and material handling operations, a photoionization detector (PID) shall be utilized to monitor potential exposure to volatile organic vapors. Monitoring of potential volatile organic vapors will be conducted within the breathing zone (i.e., 5 to 6 ft above ground surface), and will be conducted periodically. A minimum of a single measurement within the breathing zone in the work area(s) should be performed, and data obtained through the performance of this monitoring shall be recorded in the field book, noting the date, time, location and measurement obtained. More frequent vapor monitoring should be conducted as conditions warrant (i.e., recognition of offensive odors).

As a PID detects numerous volatile organic vapors and is not specific to a particular compound, the action level for organic vapors as monitored with the PID at the site is established at a level of 10 parts per million (ppm), above background levels, unless a UST or potentially petroleum impacted soils are identified and being managed. This level is the recommended ACGIH threshold limit value (TLV) for chlorobenzene; 1,2-dichlorobenzene; and naphthalene (ACGIH 2011, TLV & BEIs), Pocket Guide to Chemical Hazards.

If a UST or potential petroleum impacted soils are being managed/investigated, the action level for organic vapors as monitored with the PID at the site is established at a level of 0.5 ppm. This level is the recommended ACGIH threshold limit value (TLV) for benzene (ACGIH 2011, TLV & BEIs), Pocket Guide to Chemical Hazards. If this level is observed or exceeded within the breathing zone for more than 1 minute, a Draeger and/or Rae Systems detector tube will be used to monitor for concentrations of benzene. If the Draeger tube indicates a concentration of benzene less than 0.5 ppm and PID readings are less than 10 ppm (which is the TLV limit as identified above), operations will be allowed to continue. If the Draeger tube indicates a concentration of benzene greater than 0.5 ppm and/or PID readings are greater than 10 ppm for more than 1 minute, operations are to be suspended and personnel will move up wind of the work area until levels dissipate. If volatile organic vapor levels do not dissipate in the work area, contact the Project Manager and Health & Safety Officer, ventilation measures may be necessary in the work area and/or the required PPE may be modified to include donning of an appropriate respirator. To avoid exposure, visual screenings for dust shall be performed.

Note: Calibration, frequency of calibration, and use of the PID must be performed in accordance with the manufacturer's specifications.

Although not likely to be encountered in the proposed areas of investigation, SVOCs and Metals have been detected in soils on other parts of the site. Exposure routes for these constituents generally include dermal contact, inhalation, and ingestion. To avoid exposure, H&H will conduct visual screenings for dust. If visual dust is observed, the utility contractor will take action to reduce the creation of dust such as wetting soils.

Decontamination

Should sampling devices (i.e., stainless steel hand augers and buckets) be needed, they will be decontaminated in accordance with Section 9.1, *Field Equipment Decontamination Procedure*, of the H&H Field Procedures Guide dated February 2010. All other sampling equipment shall be disposable (i.e., nitrile gloves).

Site Control

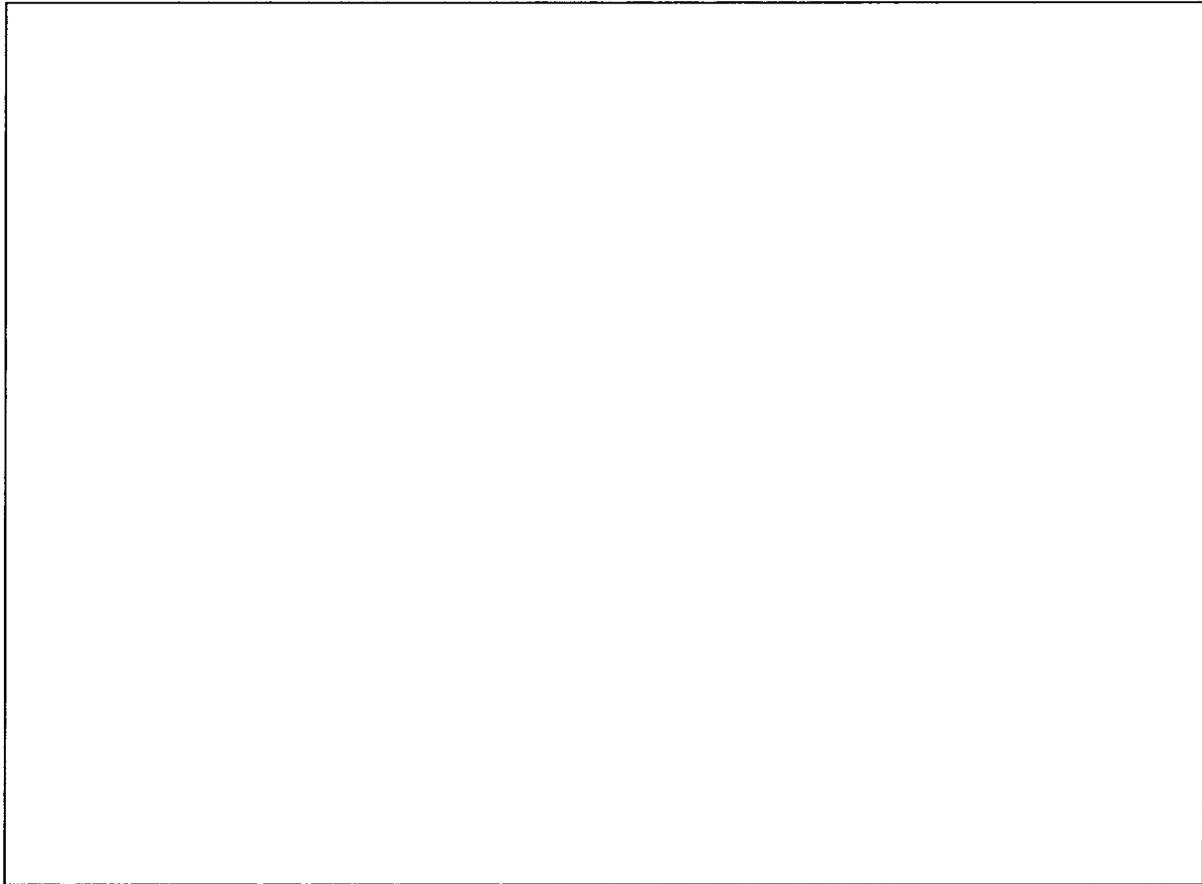
H&H will instruct utility contractors to take necessary measures to maintain site control and limit exposure of persons to hazardous conditions or hazardous materials (if identified). The excavation area will be secured if the excavation pit has to be left open overnight.

As needed, H&H and/or the utility contractor shall establish work areas to be demarked with traffic cones, barricades, caution tape, temporary construction fencing (chain link) and/or other appropriate measures. In general, a minimum perimeter of 25 ft should be established around the work area by one or more of the control measures listed above. Where possible, operations will not be conducted in a manner which increases personnel or subcontractor exposure to traffic or other hazards. **No unauthorized personnel are to be allowed in the work areas during operations.**

Safety Briefings

Safety briefings will be held on each day during which site work is performed. A minimum of one daily safety briefing will be held on the site by all personnel involved in site operations. Additional safety briefings will be conducted as site conditions or hazards change, when returning to the site following breaks in operation such as lunch or weekends, or at other appropriate times to be determined by on-site personnel or the Project Manager. Records of these safety meetings will be noted on the safety briefing log sheets (provided at the end of this document) and in the field book, and will include the date and time of the briefing, names and affiliations of attendees, and any pertinent subjects of discussion. H&H need not be present at all safety briefings

Additional Information/Notes



Reviewed By:



Shannon Cottrill
Health & Safety Officer



Bruce Hickman, PE
Project Manager

Attachment 1
Summary of Pertinent Environmental Conditions
in Proximity to the Subject Waterline Installation and Removal Activities

Previous assessment findings indicate the following conditions pertinent to the subject waterline installation and removal activities at the property:

- Historical records review from the 2007 Phase I ESA indicates the northern corner of the property was not used for operations of environmental concern. No VOC or SVOC soil impacts were detected in any of eleven soil samples collected in proximity to the northern corner of the property, with the exception of one minor acetone detection suspected to be a laboratory-induced contaminant and a few minor detections of select SVOCs below DENR Industrial SRGs. Metals detections were all below DENR Industrial SRGs, with the exception of a minor detection of arsenic in one sample at a concentration within the range of typical background concentrations. Because the East Carson Boulevard right-of-way has been historically developed with a roadway, no soil impacts are expected in this portion of the project.
- Areas of soil impact above DENR SRGs are 155 to 230 ft away from the location of the realignment and are not judged to pose ingestion, dermal contact, dust inhalation, or vapor inhalation concern for utility workers during line installation and removal activities. Appropriate worker safety and work zone demarcation measures should be taken to mitigate worker contact with contaminated soils outside the installation area.
- Groundwater occurs at a depth of 12 ft to 24 ft below ground surface, it is not expected that utility workers will encounter groundwater during realignment activities. In addition, VOCs were not detected in seven groundwater samples collected in proximity to the subject waterline work areas, with the exception of detections chloroform below DENR 2L standards. Appropriate measures should be taken to ensure the excavation integrity and worker safety as it relates to excavations in proximity to groundwater.
- Groundwater is estimated to flow in a south-southwest direction at the property. No suspected sources of groundwater impacts were identified upgradient of the northern portion of the property where the utility construction and removal is being performed.
- Areas of groundwater impact are 240 to 320 ft hydraulically downgradient of the location of the utility installation and are not judged to pose an ingestion, dermal contact, dust inhalation, or vapor inhalation concern for utility workers during line installation. Appropriate worker safety and work zone demarcation measures should be taken to mitigate worker contact with contaminated groundwater outside the utility installation area.
- There are no known or suspected USTs in the vicinity of the utility installation area at the site. The closest suspected UST is approximately 130 ft hydraulically downgradient of the water main removal.

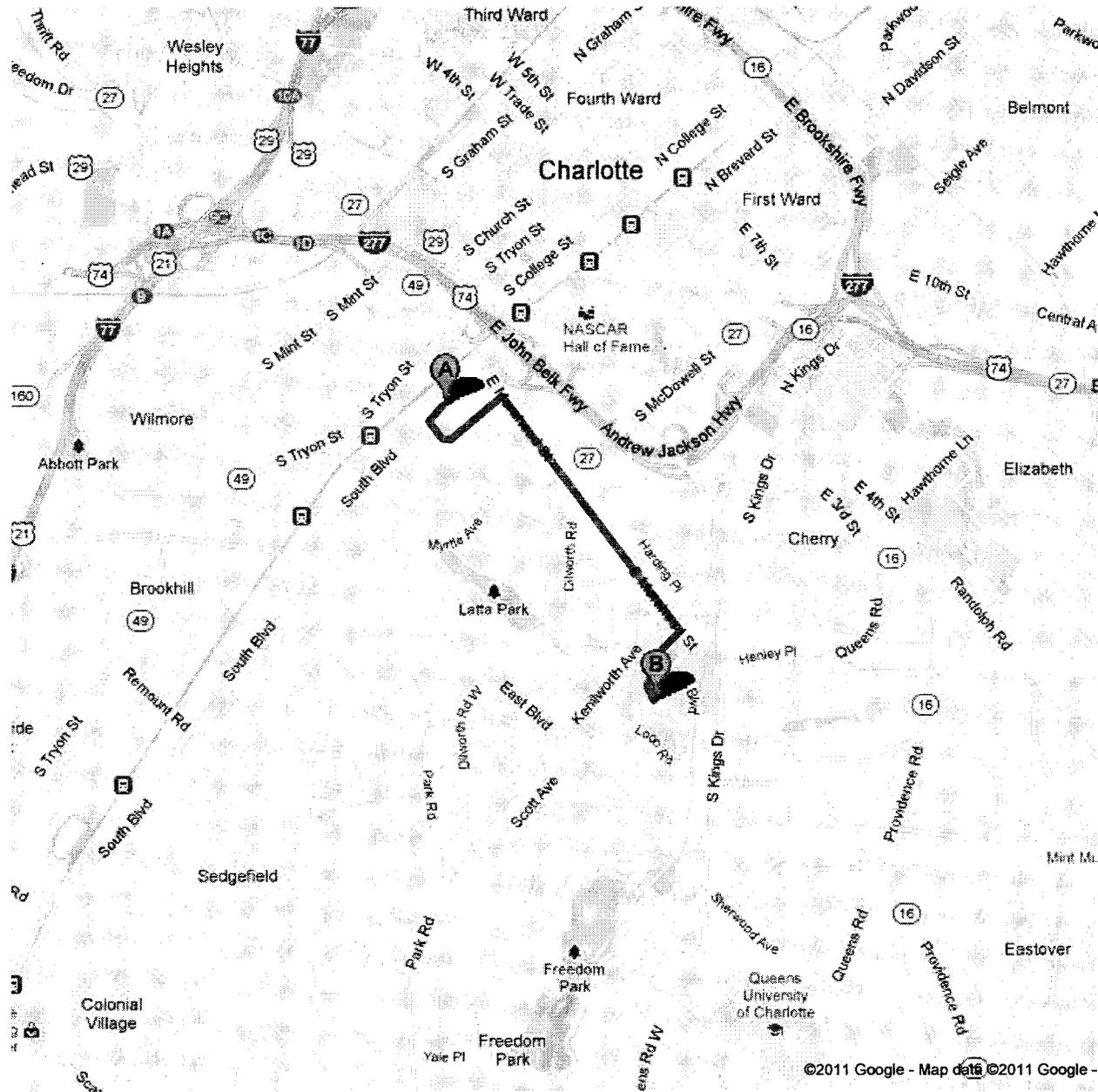
- A 1,000-gallon UST (also identified as a 550-gallon gasoline UST) believed to have been located approximately 35 ft downgradient of the existing water line was removed from the subject property in December 1999. DENR issued an Incident #21111 for the reported release below the 1,000-gallon gasoline UST. The current DENR UST database for this incident indicates impacted soils were removed and groundwater was not impacted and the incident received a Notice of No Further Action in October 2000. Available data, including SB-26 collected in 2011 and SB-11/TMW-11 collected in 2008, in the vicinity of this UST indicate no VOCs or SVOCs detected. Based on the information provided in the DENR UST database and the more recent samples collected near this former UST, it appears that impacts in the vicinity of the UST have been mitigated. Although it is possible that impacts remain in the UST basin, it appears unlikely that these impacts will be encountered during removal of the existing water line.
- The presence of other utilities at the site may provide preferential pathways for contaminant migration. Special attention should be given to locations where the new water main excavation may intercept an existing utility corridor that is in contact or close proximity with contaminated soil or groundwater at the property.
- The subject property and the surrounding area are served by Charlotte Mecklenburg Utilities water service and there are no potable water groundwater users in the vicinity of the subject property. There are several existing geothermal wells at the site which may or may not remain in service for the future development. Appropriate measures should be taken to protect the integrity of these wells during waterline activities and workers should be advised of potential safety concerns associated with groundwater at these wells.

Hospital Directions and Map



Directions to Carolinas Medical Center
1000 Blythe Boulevard, Charlotte, NC 28203 - (704) 355-2000
1.6 mi – about 5 mins

Save trees. Go green!
Download Google Maps on your phone at google.com/gmm

 1200 South Blvd, Charlotte, NC 28203

-
- 1. Head **southwest** on **South Blvd** toward **Arlington Ave** go 341 ft
total 341 ft
 -  2. Turn left onto **S Caldwell St** go 0.3 mi
total 0.4 mi
About 1 min
 -  3. Take the 3rd right onto **E Morehead St** go 0.9 mi
total 1.3 mi
About 3 mins
 -  4. Turn right onto **Morehead Medical Dr** go 0.3 mi
total 1.6 mi
Destination will be on the left
About 1 min

 **Carolinas Medical Center**
1000 Blythe Boulevard, Charlotte, NC 28203 - (704) 355-2000

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2011 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.