

# URBAN GREEN ENVIRONMENTAL

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1340 Smith Avenue, Suite 200  
Baltimore, Maryland 21209

## Supplemental Phase II Environmental Site Assesment Report

### State Center Property – Parcel I2

101 West Preston Street  
Baltimore, Maryland 21201



*Prepared For:*

**State Center LLC**  
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September 2010

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## 1.0 INTRODUCTION

State Center LLC contracted Urban Green Environmental LLC (UG) to perform a Supplemental Phase II Environmental Site Assessment (ESA) investigation of the State Center Property – Parcel I2 located at 101 West Preston Street in Baltimore, Maryland 21201.

The objective of this investigation was to provide an evaluation of the recognized environmental concerns (RECs) as identified in the *Phase I Environmental Site Assessment Report* prepared by Earth Resources Management (ERM), Inc. and dated March 2007 (ERM 2007) and in the most recent *Phase I Environmental Site Assessment Report Update* prepared by Urban Green Environmental, LLC and dated September 2010 (UG 2010a) and provide additional site characterization information to support a future application of the Site into the Maryland Voluntary Cleanup Program (VCP).

The findings of this Supplemental Phase II ESA are based solely on the data obtained and reviewed as part of this investigation, including observations and conditions that existed at the time of the field investigative activities performed in July and August 2010. Information provided by third parties is assumed to be accurate and complete.

This report was prepared for State Center LLC by Urban Green Environmental, LLC and is based in part on third party information not within the control of State Center LLC or Urban Green Environmental, LLC. While it is believed that the third party information contained herein will be reliable under the conditions and subject to the limitations set forth herein, neither State Center LLC nor Urban Green Environmental, LLC guarantee the accuracy thereof.



## 2.0 SITE BACKGROUND

### 2.1 Site Location and Description

The approximately 0.78-acre State Center Property-Parcel I2 is located on the eastern portion of the Maryland State Center complex. The Site is not currently developed with buildings; Site improvements are limited to landscaped areas and concrete sidewalks/walkways which are utilized as a small park. According to information on-file with the Maryland Department of Assessment and Taxation, the Site is identified as Block 0478, Lot 2 (northern portion) and is currently owned by the State of Maryland.

A Site location map is attached as Figure 1; a Site plan is attached as Figure 2.

The Site is not currently serviced with municipal water and sewer; however, municipal water and sewer are available in the area of the Site. The Site is serviced with below-grade electric (lighting) and storm water (municipal storm water drains were observed throughout the Site). Municipal water and sewer are provided to the Site area by the City of Baltimore; electric utilities are provided by BGE.

The Site is located in a densely developed, mixed use section of the City of Baltimore, Maryland. Surrounding properties include North Howard Street to the northeast, beyond which are the MTA lightrail and the Symphony Center Parking Garage, West Preston Street to the northwest, beyond which is the 29th Division Street (the Fifth Regiment Armory), Martin Luther King Boulevard and additional Maryland State Center property commercial buildings to the south and southwest.

### 2.2 Site History

Based on interviews with historic records and the prior environmental site assessment reports (ERM 2007, UG 2009), the Site was developed into the current use circa 1958, at which time the State of Maryland purchased the property for the development of the State Center complex. Prior to the current Site development, the property appears to have been unimproved (1950s) and improved with approximately 22 structures identified primarily as residential dwellings (rowhomes), a retail store, garage (1914), and the Baltimore Riding Academy (1901 to 1914). It is noteworthy, that circa 1914, a 150-gallon gasol tank appears to have been located on the eastern portion of the property, fronting the former garage building.

## **2.3 Environmental Setting**

### **2.3.1 Topography**

According to the U.S. Geological Survey (USGS) topographic map of Baltimore West, Maryland (1953, revised 1966/1974) Site elevation is relatively flat at approximately 114 feet (ft) above mean sea level. In general, the overall topographic trend of the subject property slopes very gently to the south/southeast.

No streams or surface water bodies were observed on-Site. The nearest surface water body, the Jones Falls, is located approximately 1,500 feet east of the Site.

### **2.3.2 Geology and Lithology**

According to information provided in the Phase I ESA Update (UG 2010a), the subject property is underlain by soils of the Urban Land Complex. The 1998 Soil Survey text defines the Urban Land Complex as an area where more than 80% of the surface is covered by asphalt, concrete, buildings, or other impervious structures.

On-site conditions were observed to be consistent with the above. Specifically, overburden soil at the Site was observed to consist of sands, sandy silts to the maximum drilling depth of 20 feet below grade.

No visual or olfactory evidence of a release, such as a chemical odor or staining was observed throughout the drilling activities. Further, results of field screening for evidence of total volatile organic compounds (VOCs) using a photoionization detector indicated background readings (0.0 parts per million).

## **2.4 Prior Environmental Investigations**

*Phase I Environmental Site Assessment Report, State Center, Baltimore, Maryland, prepared by ERM and dated March 2007.*

The scope of work of the ERM 2007 Phase I ESA consisted of a visual Site inspection and review of available historic and regulatory information for the property and surrounding State Center parcels. At the time of the ERM 2007 Phase I ESA, the Site was improved with the existing surface level asphalt paved parking area and was owned and operated by the State of Maryland.

The ERM report noted that the Site parcel was reportedly developed circa 1958, at which time the State of Maryland purchased the properties for development of the State Center. It was also noted in the Phase I ESA, that two historic fires, which occurred in 1904 and 1933, reportedly destroyed much of the Site parcel.

No evidence of hazardous material use, handling or generation were identified within the ERM 2007 Phase I ESA for the Site, further, no visual evidence of bulk storage, such as ASTs or USTs was identified. As identified in the March 2007 Phase I ESA, the results of the Phase I ESA did not indicate evidence of significant environmental concerns associated with the subject property.

*Final Limited Phase II Environmental Site Assessments, State Center, Baltimore, Maryland, prepared by Urban Green Environmental, LLC and dated October 2009.*

In October 2010, Urban Green Environmental, LLC completed a Limited Phase II Environmental Site Assessment for the Site (Parcel I2) and the nearby State Center Properties, Parcels C and G. The purpose of the assessment was to further evaluate environmental conditions identified within the prior Phase I ESA (ERM 2007) and to provide general site characterization of soil and/or groundwater at the State Center properties.

The scope of work of the UG investigation consisted of the advancement of two soil borings on the State Center Property – Parcel I2 (SB-3 and SB-4) and five soil borings at off-Site locations. Soil boring SB-3 and SB-4 were advanced to depths of 16 feet below grade and 20 feet below grade respectively. No groundwater was encountered to the maximum drilling depth of 20 feet below grade in the soil borings.

Surface and subsurface soil samples were collected from each sampling location and field screened for volatile organic compounds (VOCs). Further, surface soil samples were submitted for analysis of polycyclic aromatic hydrocarbons (PAHs) and priority pollutant metals; subsurface soil samples (collected from depths of 4 to 5 feet below grade) were submitted for laboratory analysis of VOCs, PAHs, and priority pollutant metals. Prior soil boring locations are presented on the attached Figure 2; a summary of the laboratory analytical results is included on the attached Table 1.

In summary, based on field screening results, visual and olfactory observations, no evidence of a release of petroleum products or hazardous materials were observed throughout the drilling activities. Further, no concentrations of VOCs were reported above the current applicable MDE Cleanup Standards for Residential Soil and/or background standards. However, several PAHs and chromium were reported in the surface soil sample collected from soil boring SB-3 and the subsurface soil sample collected from soil boring SB-4.

### 3.0 SUPPLEMENTAL PHASE II INVESTIGATION METHODOLOGY

#### 3.1 Purpose and Objectives

The goal of the Supplemental Phase II investigation was to provide the environmental due diligence services associated with the State Center Property – Parcel I2 to satisfy the initial due diligence elements of the Maryland Voluntary Cleanup Program (VCP). The scope of work has also been updated based on a June 30, 2010 meeting with the Maryland Department of the Environment (MDE) VCP. As indicated within the VCP pre-application meeting, the MDE VCP indicated that additional Phase II investigation support would be required to support the VCP applications for the State Center Property – Parcel I2. Based on the presence of select compounds (polycyclic aromatic hydrocarbons, or PAHs) above the current applicable MDE Cleanup Standards for Residential and Non-Residential Soil, Parcel I2 would unlikely qualify for a NFRD and would require a Response Action Plan. Toward that end, the following elements were included within this investigation to satisfy the MDE VCP requirements for the parcel.

- Completion of geophysical survey proximate to the historic 150-gallon gasol tank depicted on the 1914 historic atlas.
- Advancement of five soil borings at the Site; three soil borings (SB-13, SB-14, and SB-15) were installed approximately five feet north, south, and east of the former soil boring SB-3; one soil boring was advanced approximately 10 feet northeast of the former soil boring SB-3; the remaining soil boring was advanced proximate to the suspect former UST;
- Field screening of select soil samples (two foot intervals) from each soil boring for the presence of total volatile organic compounds;
- Collection of select composite and discrete soil samples; fixed laboratory analysis of the select soil samples for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), priority pollutant (PPL) metals, polychlorinated biphenyls (PCBs), and/or pesticides/herbicides.

The work tasks and associated field sampling activities described below were performed in general accordance with our proposal executed July 30, 2010, the *MDE Voluntary Cleanup Program Guidance Document* (MDE 2006) and the *State of Maryland Department of the Environment Cleanup Standards for Soil and Groundwater, Interim Final Guidance, Update No. 2.1* (MDE 2008).

#### 3.2 Field Investigation Procedures

Fieldwork for the Phase II ESA was conducted on July 11 and 31, 2010. The following report sections summarize the field sampling and laboratory analytical methodologies implemented during the field investigation.

### 3.2.1 Utility Mark out

Prior to initiating field activities, Urban Green coordinated with MissUtility and a private utility mark out subcontractor, to complete the required dig permit and obtain utility clearance for the Site investigation areas. In addition, the Urban Green engineer conducted a Site visit to confirm the proposed soil boring locations and below grade utility markings.

### 3.2.2 Geophysical Survey

On July 11, 2010, geophysical surveys were conducted in the areas of suspect former UST area via an electromagnetic survey, magnetic survey, and ground penetrating radar. Geophysical survey services were performed by Bucks Geophysical Corporation of Plumsteadville, Pennsylvania.

The Geonics EM31 Terrain Conductivity Meter, oriented in the vertical dipole mode was utilized for the electromagnetic survey. This instrument measures the electrical conductivity of the ground, by inducing a current into the ground that creates secondary magnetic fields that are then detected by the instrument. With historic information indicated one suspect potential UST area, the predicted response would be conductivities elevated above background across areas of a suspect UST or anomalies. Two sets of measurements are made by the instrument and consist of conductivity readings (quadrature phase) and inphase readings that are particularly sensitive to buried metallic objects. In the vertical dipole mode the instrument has an approximate depth of penetration of 16 feet below grade (carried at shoulder height).

Ground penetrating radar (GPR) data was collected using the GSSI SIR3000 digital radar unit. GPR uses radar pulses to image the subsurface of the Site. The depth range of GPR is limited by the electrical conductivity of the ground, and the transmitting frequency. As conductivity increases, the penetration depth decreases. As such, subsurface materials, such as concrete, reinforced concrete or metallic debris may reduce the effective penetration depth. The maximum depth of penetration was approximately two to four feet below grade.

The GEM Systems, Model GSM-19G magnetometer, was utilized for the magnetic survey. This instrument is used to measure the total geomagnetic field at a particular location, via three components, the main field, the external field, and local variation. Local variations are typically attributable to anomalies near the surface such as buried metal objects or above ground objects containing metallic substance.

A spatial reference grid was marked within the designated geophysical area in order to reference each of the above instrument's location during the survey and for future reference. Baselines were established in the area surveyed, and marked every 5 ft to establish references for traverses. A grid was then laid out perpendicular to each baseline at separations of 5 ft. The geophysical area (designated Geophysical Area No. 4) covered an approximate 50 feet by 40 feet area. The

geophysical survey area is depicted on Figure 2; a copy of the geophysical survey data report is included as Appendix A.

### 3.2.1 Soil Investigation

On July 31, 2010, under the supervision of the Urban Green Engineer, four soil borings were advanced at the Site. Soil borings were advanced from grade using truck-mounted direct push technology (Geoprobe). Drilling services were performed by Green Services, Inc. of Bel Air, Maryland. The direct push technology method utilizes a two-inch inner diameter, four foot long, stainless steel sampler lined with a dedicated high-density polyethylene (HDPE) liner. The HDPE-lined stainless steel sampler is hydraulically driven into the subsurface for soil core retrieval. Soil borings were advanced to a maximum depth of 15 feet below grade (ft bg). A summary of the soil borings is provided below; soil boring locations are also provided on Figure 2.

- *SB-13, SB-14, and SB-15 – Additional Site Characterization, former soil boring SB-3:* Soil borings SB-13, SB-14, and SB-15 were each advanced to refusal (14, 15, and 12 ft bg, respectively). No groundwater was encountered.
- *SB-16 - Additional Site Characterization, former soil boring SB-3:* Soil boring SB-16 was advanced in the grass covered landscaped area approximately 10 feet northeast of the former soil boring SB-3 using a hand auger to a depth of approximately 5 feet below grade. No groundwater was encountered.
- *SB-17 –Former Gasol Tank:* Soil boring SB-17 was advanced to a depth of 10 ft bg. No groundwater was encountered.

Immediately following the direct push sampler retrieval, the HDPE sample liner was opened by the Urban Green Engineer, and screened, at approximate two foot intervals for evidence of total VOCs using a photoionization detector (PID). Discrete grab soil samples were then collected directly from the sample core liner using disposable, dedicated aseptic sampling devices.

A log of field activities, including photographs and logs of the continuous soil borings were maintained throughout the field activities. Soil boring logs, including soil lithology, recovery and field observations are provided in Appendix B.

Soil borings were advanced to a maximum depth of 15 ft bg. Bedrock was not observed to the maximum drilling depth of 15 ft bg; groundwater was not observed.

Select soil samples were collected from each soil boring and submitted for laboratory analysis of VOCs via USEPA Method 8260B; SVOCs via USEPA Method 8270C; PPL metals via USEPA Method 6020A; PCBs via USEPA Method 8082; and pesticide/herbicide analysis was performed via USEPA 8081A/8151A.



One composite surface and one composite subsurface soil sample was collected from soil borings SB-13, SB-14, and SB-15. Further, one subsurface soil sample was collected from soil boring SB-17. The above samples intervals were selected based on the MDE VCP recommendations for Phase II environmental site assessments.

Soil samples were collected with dedicated sampling equipment into new, clean sample containers. The soil samples were labeled with sample designation, date and time, and the required analyses. Soil samples were then placed on ice in a portable cooler prior to hand-delivery to Caliber Analytical Services in Towson, Maryland. Chain-of-Custody (COC) forms were maintained (and accompanied the samples in transit) to provide a record of samples from collection to analyses. A copy of the laboratory analytical report and associated COC is included in Appendix C.

### **3.3 Quality Assurance/Quality Control Procedures**

QA/QC protocol covered general aspects of measurement systems design and implementation, including sampling methods, data handling, and QC measures employed. QA/QC procedures followed during the investigation included the use of dedicated sampling equipment for all sampling activities.

### **3.4 Sample Handling/Chain of Custody**

Soil samples collected for laboratory analyses were recorded on soil boring logs and in the project field notes. Field notes will be kept at Urban Green on file for reference. Each sample collected during field activities was given a unique sample designation (Table 1). The sample identification (ID) was used to establish each discrete sampling point. The sample ID also was included on the laboratory chain of custody as well as the bottle label. The interval (e.g. 0-1) identified following the soil boring identification in the following sections represents the discrete depth interval in feet below grade at which the soil sample was collected.

Following sample collection, containers were sealed and placed in a cooler with bagged ice and cooled to 4°C or less. The COC was placed in a plastic bag and taped to the inside of the cooler lid for submission to Caliber Analytical Services. Soil samples were then hand-carried under strict COC procedures to Caliber Analytical Services in Towson, Maryland for analysis. Samples were analyzed with standard one week turn-around time from receipt of samples.

### **3.5 Decontamination and Investigation-Derived Material Handling Procedures**

The primary objective of the decontamination process was to prevent the accidental introduction of potential contaminants to non-contaminated areas and/or samples. During field activities, a designated decontamination area was established and equipped with decontamination equipment (wash buckets, brushes, spray bottles, potable water, distilled water, towels, etc.) to adequately decontaminate the equipment used on-site. To the maximum extent possible, dedicated equipment

was used at each media sample location. Specifically, the direct push sample tubes (macrocores) were lined with a HDPE liner. Further, disposable plastic bags were used to homogenize each soil sample (non-VOC analysis), as required for fixed laboratory analysis.

Sampling equipment that was not dedicated to one sample location was washed with a medical-grade detergent wash, rinsed with distilled water and allowed to air dry.

Following completion of each soil boring, soil cuttings generated during sampling activities were placed directly down the soil boring. Sampling locations were finished at grade with a concrete slurry / bentonite and concrete.

## **4.0 PHASE II INVESTIGATION RESULTS**

### **4.1 Site Conditions**

#### **4.1.1 Lithology**

Soil lithology at the Site consisted of sands, sandy silts to the maximum drilling depth of 15 feet below grade. In addition, fill materials (brick) were observed in soil boring SB-13.

No visual or olfactory evidence of a release, such as a chemical odor or staining was observed throughout the drilling activities. Further, results of field screening for evidence of total volatile organic compounds (VOCs) using a photoionization detector indicated background readings (0.0 parts per million).

### **4.2 Geophysical Investigation Results**

Results of the geophysical survey indicated one anomalous area, three areas of high and low magnetic conductive and several possible pipes or utilities. A description of each subsurface anomaly, and associated contour maps of the grid areas are provided in Appendix B.

No anomalies, indicative of a remaining UST were identified.

### **4.3 Soil Analytical Results**

A summary of the laboratory analytical results for soil is presented in Table 1 and discussed below. The full laboratory analytical data reports are provided in Appendix C.

In total, three soil samples (composite and discrete) were collected from select locations and submitted for fixed laboratory analysis of VOCs, PAHs, PPL Metals, PCBs, pesticides, and herbicides. For comparative purposes, the analytical results are herein compared with the MDE Cleanup Standards for Non-Residential Soil.

#### **4.3.1 Volatile Organic Compounds**

One subsurface sample (SB-17 4-5) was submitted for fixed analysis of VOCs. As shown in Table 1, no detectable concentrations of VOCs were reported in subsurface soil.

#### **4.3.2 Semivolatile Organic Compounds**

Two soil samples (one composite surface soil and one composite subsurface soil sample from soil boring SB-13 through SB-15) were submitted for fixed analysis of SVOCs.

As shown in Table 1, SVOCs were reported in surface or subsurface soil above the current applicable MDE Cleanup Standards for Residential Soil, but below the current applicable MDE Cleanup Standards for Non-Residential Soil.

#### **4.3.3 Metals**

Two soil samples (one composite surface soil and one composite subsurface soil sample from soil boring SB-13 through SB-15) were submitted for fixed analysis of PPL Metals.

With the exception of arsenic (4.6 mg/kg), no concentrations of PPL metals were reported in soil above the MDE Cleanup Standards for Non-Residential Soil. The current applicable MDE Cleanup Standard for arsenic is 3.6 mg/kg.

Priority pollutant metals occur widely in the earth's crust as natural minerals and are therefore, commonly identified in soil. The MDE has compiled data regarding anticipated concentrations of various metals for soil throughout the state, which are referenced as the Anticipated Typical Concentrations (ATC)/Reference Levels of Metals in the State of Maryland. A listing of these concentrations as compared to the concentrations identified at the Site is illustrated in Table 1. As shown, the concentrations of arsenic are comparable to the ATC for metals in the Site area. As such, the occurrence of these metals in the above referenced soil borings are likely attributable to background conditions within the soil matrix and not representative of a release.

#### **4.3.4 PCBs, Pesticides and Herbicides**

Two soil samples (one composite surface soil and one composite subsurface soil sample from soil boring SB-13 through SB-15) were submitted for fixed analysis of PCBs, pesticides, and herbicides. No detectable concentrations of PCB congeners, pesticides or herbicides were reported.

## 5.0 CONCLUSIONS

State Center LLC contracted Urban Green to perform a Supplemental Phase II ESA of the State Center Property – Parcel I2 located at 101 West Preston Street in Baltimore, Maryland. The objective of this investigation was to provide additional environmental due diligence services associated with the State Center Property – Parcel I2 to satisfy the initial due diligence elements of the Maryland VCP. Specifically, as indicated within the VCP pre-application meeting conducted in June 2010, the MDE VCP indicated that additional Phase II investigation support would be required to support the VCP applications for the State Center Property – Parcel I2. Based on the presence of select compounds (polycyclic aromatic hydrocarbons, or PAHs) above the current applicable MDE Cleanup Standards for Residential and Non-Residential Soil, Parcel I2 would unlikely qualify for a NFRD and would require a Response Action Plan.

The scope of this investigation consisted of advancing five soil borings (SB-13 through SB-17) at the Site and performing a geophysical investigation to further evaluate for the potential for an UST to remain at the property. In general, soil boring locations were biased towards the area of the former elevated PAHs (former soil boring SB-3) and the suspect historic UST. Select soil samples were collected from each soil boring and submitted for fixed laboratory analysis of VOCs, PAHs, PPL Metals, PCBs, pesticides, and/or herbicides.

### 5.1 Geophysical Investigation Results

No anomalies, indicative of a remaining UST, were identified based on the results of the geophysical investigation. Results of the geophysical survey did indicate one anomalous area, three areas of high and low magnetic conductive and several possible pipes or utilities.

### 5.2 Soil

With the exception of arsenic, no analytes were reported at concentrations in excess the currently applicable MDE Cleanup Standards for Non-Residential soil. Specifically,

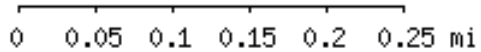
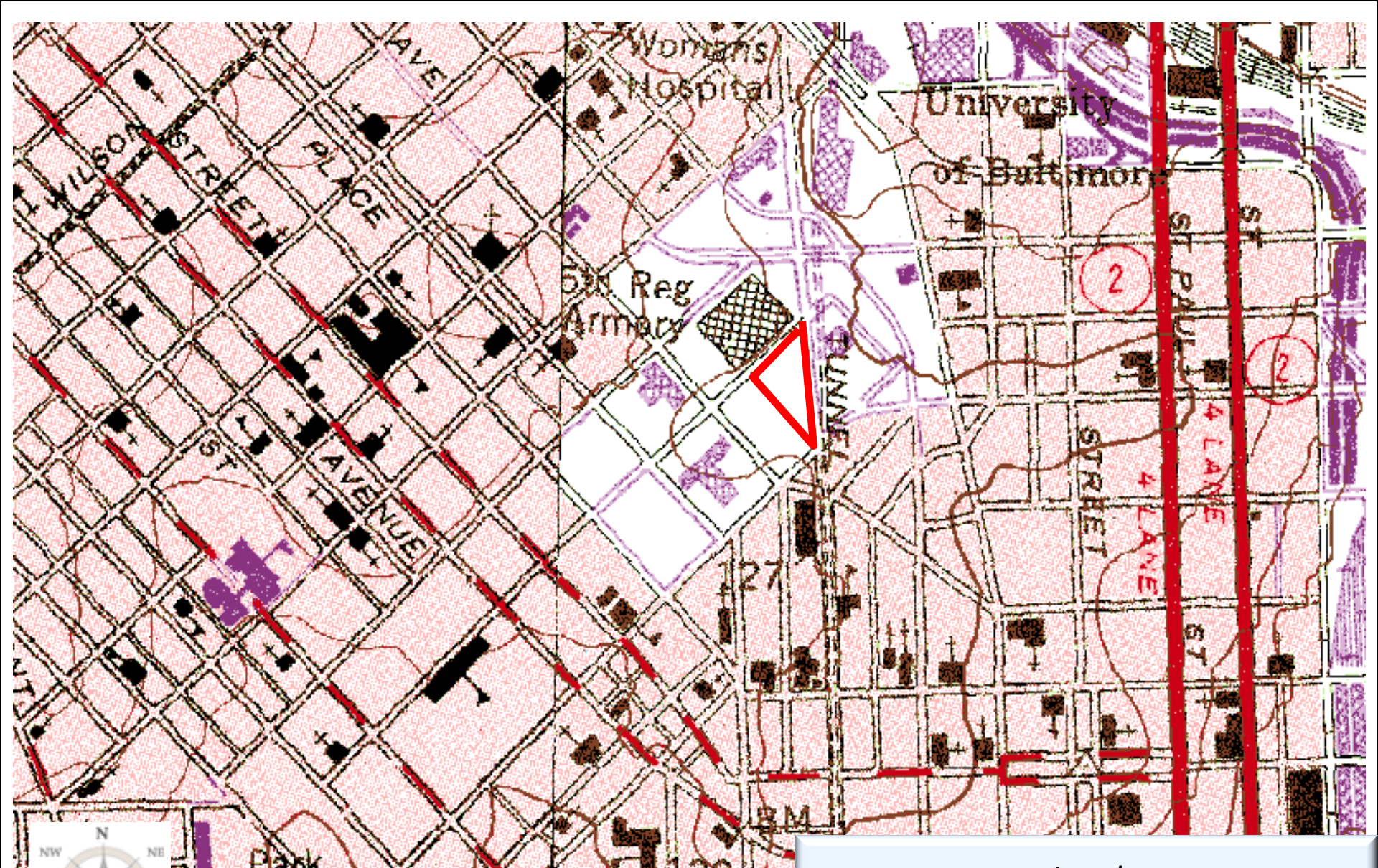
- Arsenic was reported above the current applicable state cleanup standard (3.6 mg/kg) in the composite surface soil sample collected from soil borings SB-13, SB-14, and SB-15 at a concentration of 4.6 mg/kg.

Priority pollutant metals occur widely in the earth's crust as natural minerals and are therefore, commonly identified in soil. The MDE has compiled data regarding anticipated concentrations of various metals for soil throughout the state, which are referenced as the ATC/Reference Levels of Metals in the State of Maryland. The concentrations of arsenic are comparable to the ATC for metals in the Site area. As such, the occurrence of these metals in the above referenced soil borings are likely attributable to background conditions and not representative of a release.

## 6.0 REFERENCES

- Environmental Resources Management, Inc. (ERM). 2007. *Phase I Environmental Site Assessment State Center, Baltimore, Maryland*. March.
- Maryland Department of the Environment (MDE). 2006. *Voluntary Cleanup Program Guidance Document*. March.
- MDE. 2008. *State of Maryland Department of the Environment Cleanup Standards for Soil and Groundwater, Interim Final Guidance (Update No. 2.1)*. August.
- STV, Inc. (STV). 2009. Existing Electric/Conduit, Existing Sanitary, Existing Storm Drain, Existing Gas Plans. August.
- Urban Green Environmental (UG). 2009. *Final Limited Phase II Environmental Site Assessment Report, State Center Property*. October.
- UG. 2010. *Draft Phase I Environmental Site Assessment Report Update, State Center Property – Parcel I2*. September.





**Legend**

— Property Boundaries

Basemap Source: Topozone.com



**Soil Borings SB-13, SB-14, and SB-15**

Composite surface and subsurface soil samples collected to evaluate prior soil boring SB-3 (elevated PAHs in surface soil).

No visual or olfactory evidence of impacts  
Field screening for VOCs – 0.0 ppmv

Soils characterized as non-hazardous  
Although elevated PAHs were reported in the composite soil sample; in contrast to the October 2009 results, results are above the MDE Residential Cleanup Standards but below the MDE Non-Residential Cleanup Standards.



**SB-17 Suspect Former UST Location**  
Geophysical Investigation – No evidence of remaining UST  
No visual or olfactory evidence of impacts  
Field screening for VOCs – 0.0 ppmv

**Suspect Former Gasol Tank**

**Geophysical Investigation Area**

**Lot I2**  
101 West Preston Street

**Legend**

- Property Boundaries
- Suspect Former UST Location
- Prior Soil Boring Location
- Prior Soil Boring/Temp Groundwater Well Location
- Proposed Soil Boring Location



Table 1 Summary of Soil Analytical Results  
 Limited Phase II Environmental Site Assessment  
 State Center Property - Parcel I2, Baltimore, Maryland 21201

ANALYTE	MDE Cleanup Standard - Residential <sup>(1)</sup>	MDE Cleanup Standard - Non Residential <sup>(1)</sup>	ATC <sup>(2)</sup>	October 2009 Limited Phase II ESA				August 2010 Limited Phase II ESA		
				SB-3 0-1	SB-3 4-5	SB-4 0-1	SB-4 4-5	COMP 13.14.15 0-1	COMP 13.14.15 4-5	SB-17 4-5
<b>Pesticides (SW8081A / ug/kg)</b>	NA	NA	NA	Not analyzed	Not analyzed	Not analyzed	Not analyzed	ND	Not analyzed	Not analyzed
<b>Herbicides (SW8151A / ug/kg)</b>	NA	NA	NA	Not analyzed	Not analyzed	Not analyzed	Not analyzed	ND	Not analyzed	Not analyzed
<b>PCBs (SW8082 / mg/kg)</b>	NA	NA	NA	Not analyzed	Not analyzed	Not analyzed	Not analyzed	ND	Not analyzed	Not analyzed
<b>Priority Pollutant Metals (SW6020 / mg/kg)</b>										Not analyzed
Antimony	3.1	41	6	< 1.8	< 1.7	< 2.6	< 2.3	< 2.7	< 2.6	
Arsenic	0.43	1.9	3.6	<b>2.2</b>	<b>2.5</b>	<b>2.6</b>	<b>1.3</b>	<b>4.6</b>	<b>0.92</b>	
Beryllium	16	200	0.66	< 1.8	< 1.7	< 2.6	< 2.3	< 2.7	< 2.6	
Cadmium	3.9	51	0.73	< 1.8	< 1.7	< 2.6	< 2.3	< 2.7	< 2.6	
Chromium	23	310	28	<b>15</b>	<b>14</b>	<b>43</b>	<b>29</b>	<b>120</b>	<b>12</b>	
Copper	310	4,100	12	<b>8.6</b>	<b>3.5</b>	<b>30</b>	<b>28</b>	<b>170</b>	< 2.6	
Lead	400	1000	45	<b>53</b>	<b>23</b>	<b>16</b>	<b>7.4</b>	<b>170</b>	<b>3.6</b>	
Mercury	--	--	0.51	<b>0.078</b>	< 0.07	< 0.11	< 0.093	< 0.11	< 2.6	
Nickel	160	2,000	13	<b>6.7</b>	<b>5.8</b>	<b>35</b>	<b>32</b>	<b>6.4</b>	< 2.6	
Selenium	39	510	2.2	< 1.8	< 1.7	< 2.6	< 2.3	< 2.7	< 2.6	
Silver	39	510	0.94	< 1.8	< 1.7	< 2.6	< 2.3	< 2.7	< 2.6	
Thallium	0.55	7.2	3.9	< 1.5	< 1.4	< 2.1	< 2.3	< 2.2	< 2.6	
Zinc	2,300	31,000	63	<b>33</b>	<b>17</b>	<b>76</b>	<b>74</b>	<b>24</b>	<b>7.7</b>	
<b>Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons (SW8270C / ug/kg) <sup>(3)</sup></b>										
Acenaphthene	470,000	6,100,000	NA	<b>14</b>	< 5	< 6	< 5	< 5	< 5	
Acenaphthylene	470,000	6,100,000	NA	<b>340</b>	< 5	< 6	< 5	< 5	<b>53</b>	
Anthracene	2,300,000	31,000,000	NA	<b>120</b>	< 5	< 6	< 5	< 5	<b>26</b>	
Benzo(a)anthracene	220	3,900	NA	<b>330</b>	< 5	<b>13</b>	<b>8</b>	< 5	<b>78</b>	
Benzo(a)pyrene	22	390	NA	<b>800</b>	< 5	<b>12</b>	<b>6</b>	<b>6</b>	<b>190</b>	
Benzo(b)fluoranthene	220	3,900	NA	<b>820</b>	< 5	<b>16</b>	<b>10</b>	<b>7</b>	<b>210</b>	
Benzo(g,h,i)perylene	230,000	3,100,000	NA	<b>250</b>	< 5	< 6	< 5	< 5	<b>110</b>	
Benzo(k)fluoranthene	2,200	39,000	NA	<b>260</b>	< 5	<b>7</b>	<b>5</b>	< 5	<b>100</b>	
Chrysene	22,000	390,000	NA	<b>380</b>	< 5	<b>13</b>	<b>8</b>	< 5	<b>91</b>	
Dibenz(a,h)anthracene	22	390	NA	<b>60</b>	< 5	< 6	< 5	< 5	<b>31</b>	
Fluoranthene	310,000	4,100,000	NA	<b>320</b>	< 5	<b>21</b>	<b>13</b>	<b>5</b>	<b>100</b>	
Fluorene	310,000	4,100,000	NA	<b>6</b>	< 5	< 6	< 5	< 5	<b>6</b>	
Indeno(1,2,3-c,d)Pyrene	220	3,900	NA	<b>230</b>	< 5	<b>6</b>	< 5	< 5	<b>100</b>	
2-Methylnaphthalene	31,000	410,000	NA	<b>51</b>	<b>13</b>	< 6	<b>5</b>	< 5	<b>8</b>	
Naphthalene	160,000	4,100,000	NA	<b>75</b>	<b>14</b>	< 6	< 5	< 5	<b>11</b>	
Phenanthrene	2,300,000	31,000,000	NA	<b>130</b>	< 5	<b>12</b>	<b>13</b>	< 5	<b>52</b>	
Pyrene	230,000	3,100,000	NA	<b>840</b>	< 5	<b>28</b>	<b>16</b>	<b>7</b>	<b>160</b>	
<b>Volatiles Organic Compounds (SW8260B / ug/kg)</b>				Not analyzed	ND	Not analyzed	ND	Not analyzed	Not analyzed	ND
<b>Total Petroleum Hydrocarbons (SW8015C / mg/kg)</b>				Not analyzed	Not analyzed	Not analyzed	Not analyzed	Not analyzed	Not analyzed	Not analyzed
Gasoline Range Organics	230	620	NA							
Diesel Range Organics	230	620	NA							

Notes / Superscripts

Only detected analytes are shown.

(1) State of Maryland Department of the Environment Cleanup Standards for Soil and Groundwater, Interim Final Guidance, Update No. 2.1 (MDE 2008).

(2) Anticipated Typical Concentrations (ATCs) represent reference or background levels published by the MDE for the Site area.

(3) Soil samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) in October 2009 and semivolatile organic compounds (SVOCs) in August 2010.

ND - Analyte(s) not detected in sample.

Not Analyzed - sample not analyzed for select parameters.

**APPENDIX A**  
GEOPHYSICAL INVESTIGATION REPORT

July 27, 2010

Denise Sullivan  
Urban Green Environmental, LLC.  
1700 Beason Street  
Baltimore, MD 21230



**REPORT: GEOPHYSICAL INVESTIGATION**  
State Center Property Parcels  
Baltimore, MD

Dear Ms. Sullivan:

We are pleased to present our report of the geophysical investigation for the State Center Properties located in Baltimore, MD. The investigation was performed on July 11, 2010.

If you have any questions concerning this report please contact us at 215-345-7193. We look forward to working with you in the future.

Respectfully submitted,  
**BUCKS GEOPHYSICAL CORPORATION**

A handwritten signature in cursive script that reads "Matthew J. McMillen".

Matthew J. McMillen  
Geophysicist

## **1) INTRODUCTION AND PURPOSE**

The property located at 900 North Eutaw Street and a property located at 101 West Preston Street in Baltimore, MD were the locations of this geophysical survey. The survey was conducted on three areas of the North Eutaw Street property and a portion of the West Preston Street property that were accessible to the geophysical instrumentation.

The purpose of this geophysical survey was to locate possible tanks and to investigate subsurface conditions. Electromagnetic terrain conductivity (EM-31), ground penetrating radar (GPR), and magnetometry (MAG) were employed for the survey. Brief descriptions of each technique are given in Appendix A.

## **2) REFERENCE GRID**

A reference grid was established to accurately locate the geophysical stations using a 300-foot measuring tape and paint. The survey lines were spaced 2.5 feet and 5 feet apart and were marked every 5 feet or 25 feet. Figures 1, 6, 11, and 16 shows the locations of the survey lines and the extent of the geophysical coverage.

## **3) GEOPHYSICAL METHODOLOGY**

### **3a) Electromagnetic Survey**

Electromagnetic data were gathered using a Geonics EM-31 Terrain Conductivity Meter oriented in the vertical dipole mode which obtains subsurface data to an effective depth of about 16 feet.

Data were recorded on a Model 720 digital recorder. Both conductivity data (mmhos/m) and in-phase data (parts per thousand), along with the line number, and station location were recorded at each station. Field observations were noted in a field book. EM-31 data were collected at 0.5 second intervals (approximately every 2.5 feet) along survey lines spaced 5 feet apart. The data was downloaded to a laptop computer for processing and generation of conductivity contour map.

### **3b) Ground Penetrating Radar Survey**

Ground penetrating radar data were collected using a GSSI SIR3000 digital radar unit with 400 mhz antenna. Data were collected continuously on survey lines spaced 2.5 feet apart and orientated perpendicular to each other. Depth of investigation was approximately 2 - 4 feet with this antenna due to subsurface conditions.

### **3c) Magnetic Survey**

Magnetic data were collected using a GEM Systems GSM-19G magnetometer. Magnetic data were collected at 0.5 sec intervals (approximately every 2.5 feet) along survey lines spaced 5 feet apart. Data was downloaded to a laptop computer for processing and generation of magnetic contour maps.



#### 4) INTERPRETATION

##### AREA 1

Area 1 is located on the northeast corner of the parking lot. The geophysical survey of this area detected an anomalous area and several possible pipes or utilities.

The anomalous area was detected at approximately 2+19N to 2+31N, 1+90E to 1+96E. The cause of this area is unknown but may be a possible pipe or foundation. Figure 3 shows the location of this area.

Figure 3 shows the locations of the possible pipes or utilities detected by the survey.

##### AREA 2

Area 2 is located on the southeast corner of the parking lot. The geophysical survey of this area detected four possible pipes or tanks, six anomalous areas, a conductivity high, a magnetic high, a possible subsurface layer, and numerous possible pipes or utilities.

Four possible pipes or tanks were detected by the geophysical survey at approximately:

- 1) 1+56N to 1+60N, 1+87E to 1+94E
- 2) 1+61N to 1+64N, 1+89E to 1+94E
- 3) 1+91N to 1+94N, 1+34E to 1+41E
- 4) 2+21N to 2+26N, 1+85E to 1+93E

These areas are most likely pipes but could be tanks. Figure 8 shows the locations of these areas.

Six anomalous areas were detected by the geophysical survey at approximately:

- 1) 1+20N to 1+35N, 1+80E to 1+92E
- 2) 1+42N to 1+49N, 1+80E to 1+84E
- 3) 2+00N to 2+18N, 1+21E to 1+29E
- 4) 2+22N to 2+33N, 1+50E to 1+61E
- 5) 2+31N to 2+41N, 1+26E to 1+41E
- 6) 2+36N to 2+42N, 1+61E to 1+68E

The causes of these areas are unknown but could be buried debris, concrete, etc.. Figure 8 shows the locations of these areas.

A conductivity high was detected by the survey at approximately 1+70N to 2+17N, 1+53E to 1+89E. The cause of this area is unknown but may be caused by subsurface material with a higher conductivity than the surrounding material such as clay or slag. Figure 8 shows the location of this area.

A magnetic high was detected by the survey at approximately 2+54N to 2+75N, 1+87E to 1+92E. This area may be caused by a foundation wall, buried metal, or interference. Figure 8 shows the location of this area.

A possible subsurface layer was detected by the survey at approximately 1+40N to 1+57N, 1+29E to 1+44E. This may be caused by buried concrete slab or a layer of pavement. See Figure 8 for the location of this area.

Figure 8 shows the locations of the possible pipes or utilities detected by the survey.

### AREA 3

Area 3 is located north central part of the parking lot. The geophysical survey of this area detected an area of possible buried debris, an area of disturbed conductivity, a possible subsurface layer, and several possible pipes or utilities.

The area of possible buried debris was detected at approximately 1+25N to 1+43N, 1+11E to 1+28E. Figure 13 shows the location of this area.

An area of disturbed conductivity was detected by the survey at approximately 1+09N to 1+45N, 1+00E to 1+47E. This may be caused by a demolished building. See Figure 13 for the location of this area.

A possible subsurface layer was detected at approximately 1+19N to 1+40N, 1+34E to 1+45E. This may be caused by a buried slab or pavement. Figure 13 shows the location of this area.

See Figure 13 for the locations of the possible pipes or utilities detected in this area.

### AREA 4

Area 4 is located along North Howard Street. The geophysical survey of this area detected an anomalous area, a magnetic high, two magnetic lows, a possible utility box, and several possible pipes or utilities.

The anomalous area was detected by the survey at approximately 1+24N to 1+34N, 1+25E to 1+30E. The cause of this area is unknown. Figure 18 shows the location of this area.

A magnetic high was detected at approximately 1+25N to 1+36N, 1+09E to 1+13E. The cause of this area is unknown but may be cultural interference. Figure 18 shows the location of this area.

Two magnetic lows were detected by the survey at approximately:

- 1) 1+13N to 1+26N, 1+04E to 1+11E

2) 1+27N to 1+38N, 1+30E to 1+36E

The causes of these areas are unknown but could be cultural interference. Figure 18 shows the locations of these areas.

A possible utility box was detected at approximately 1+00N to 1+11N, 1+27E to 1+34E. This is related to the manhole cover located in this area. Figure 18 shows the location of this area.

See Figure 18 for the locations of the possible pipes or utilities detected by the survey.

### 5) CONCLUSIONS and RECOMMENDATIONS

The geophysical investigation of the State Center Property Parcels located in Baltimore, MD detected eight anomalous areas, four possible pipes or tanks, one conductivity high, two magnetic highs, two magnetic lows, two possible subsurface layers, an area of possible buried debris, an area of disturbed conductivity, a possible utility box, and numerous possible pipes or utilities.

Eight anomalous areas were detected in the four areas. One area in Area 1, six areas in Area 2, and an area in Area 4. The causes of these areas are unknown. Further investigation using other means of these areas is recommended to determine the exact cause of each.

Four possible pipes or tanks were detected in Area 2. Further investigation using other means is recommended to determine the exact cause of each.

A conductivity high was detected in Area 2. Further investigation may be considered.

A magnetic high was detected in Area 2 and Area 4. The causes of the magnetic high in Area 4 may be cultural interference. Further investigation of both may be considered to determine the cause of each.

Two magnetic lows were detected in Area 4. These areas may be caused by cultural interference.

A possible subsurface layer was detected by the survey in Area 2 and Area 3.

An area possible buried debris was detected in Area 3. Further investigation may be considered for this area.

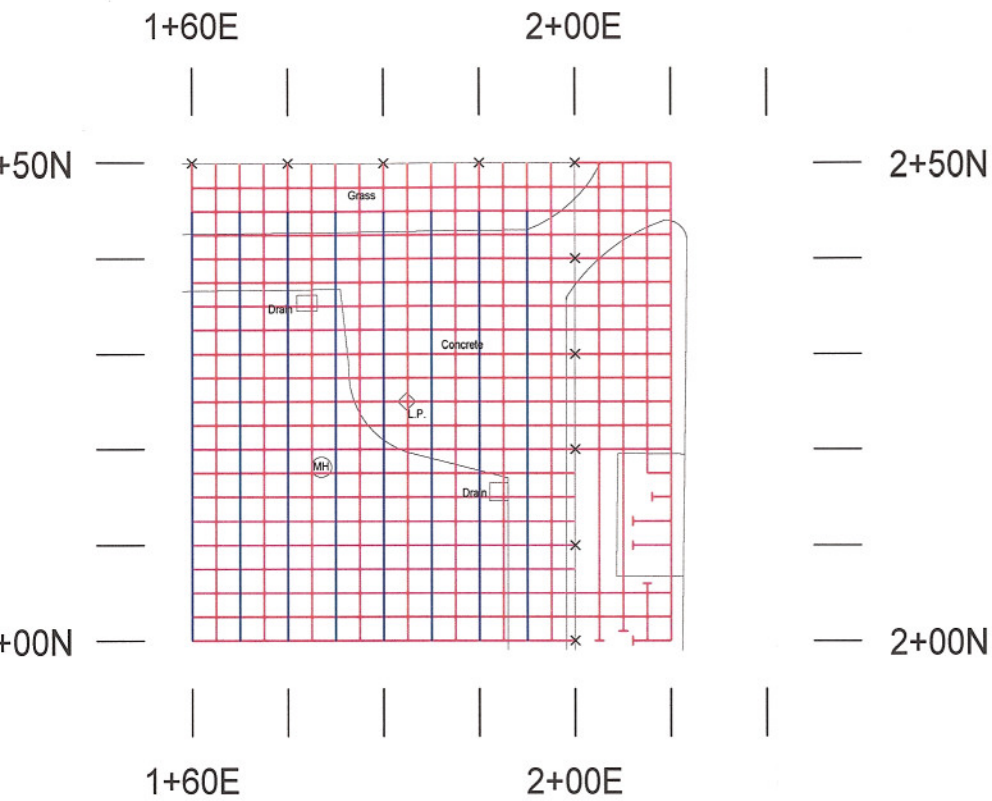
An area of disturbed conductivity was in Area 3. This may be caused by a demolished building.

Depth of investigation for the GPR was limited due to site subsurface conditions.



Not all objects or areas may have been detected by the geophysical survey due to subsurface conditions and equipment limitations.

Figures 3, 8, 13, and 18 show the locations of all areas and objects detected by the geophysical survey.

**FIGURES**



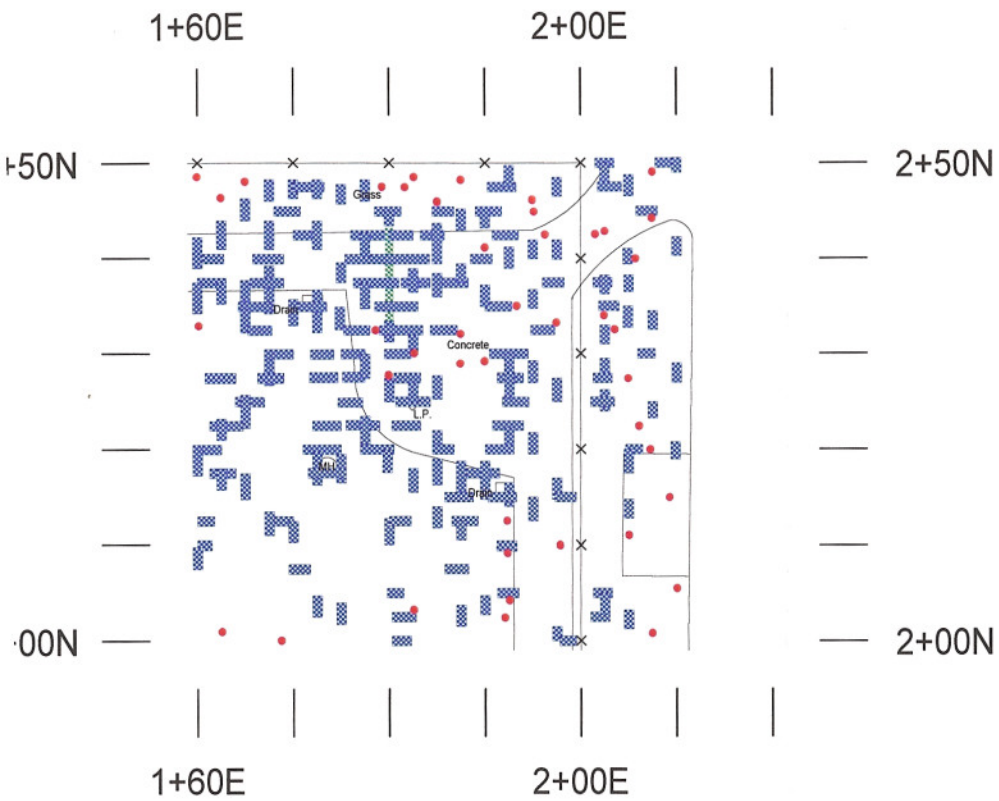
### Explanation

-  GPR only
-  EM-31, GPR, and MAG

**FIGURE 1**  
**GEOPHYSICAL COVERAGE, AREA 1**  
State Center Property Parcels  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

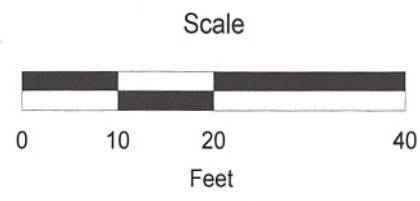
**BUCKS GEOPHYSICAL CORPORATION**  
P.O. Box 388, Plumsteadville, PA 18949





Explanation

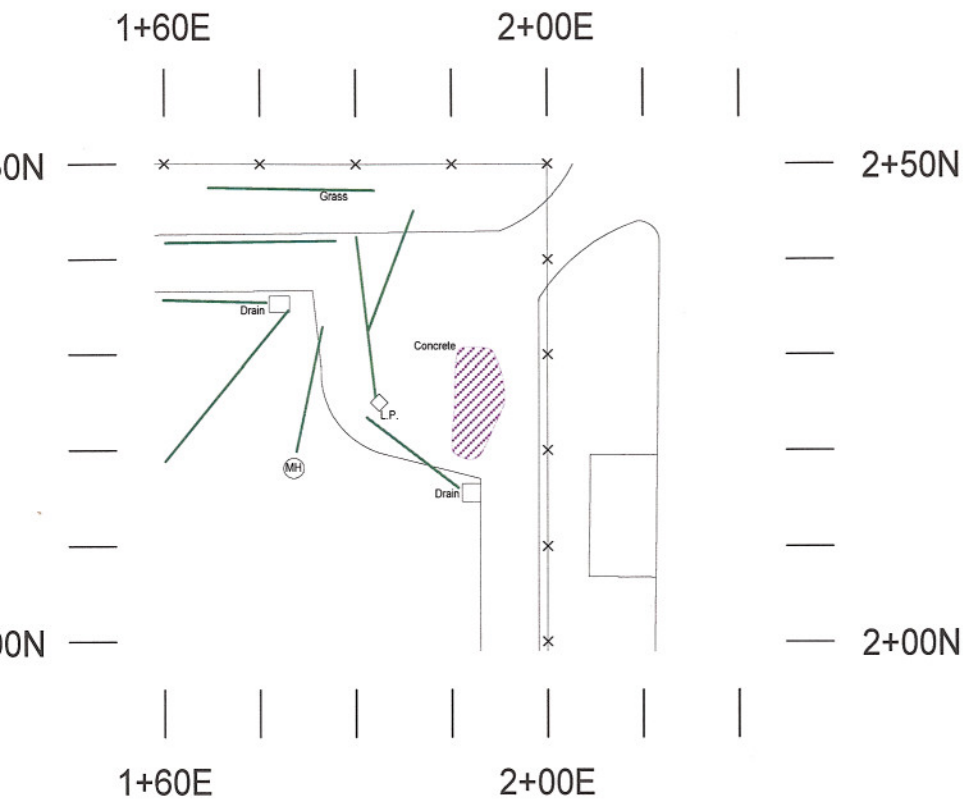
- Point target  
( Pipe, brick, cobble, metal, etc. )
- Larger GPR reflector
- Possible subsurface layer





**FIGURE 2**  
**GPR ANOMALY MAP, AREA 1**  
 State Center Property Parcels  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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Explanation

-  Possible pipe or utility
-  Anomalous area



Scale

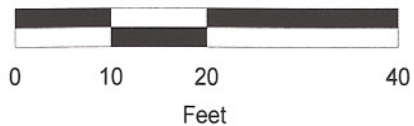
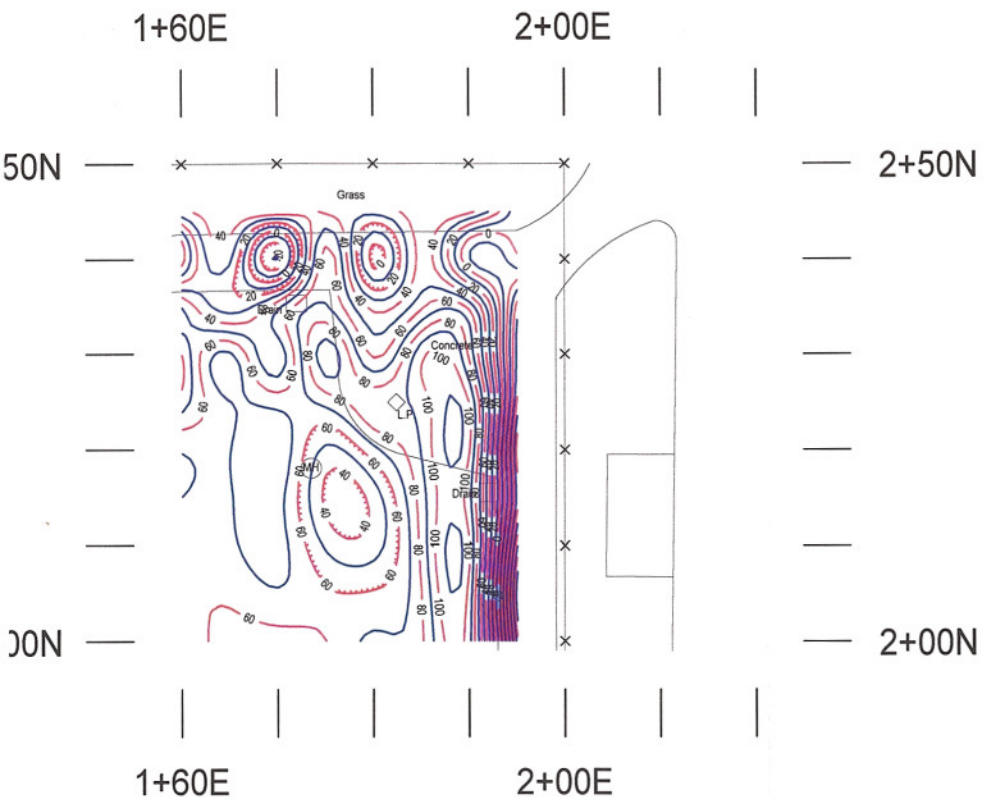


FIGURE 3  
 INTERPRETATION, AREA 1  
 State Center Property Parcels  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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Explanation


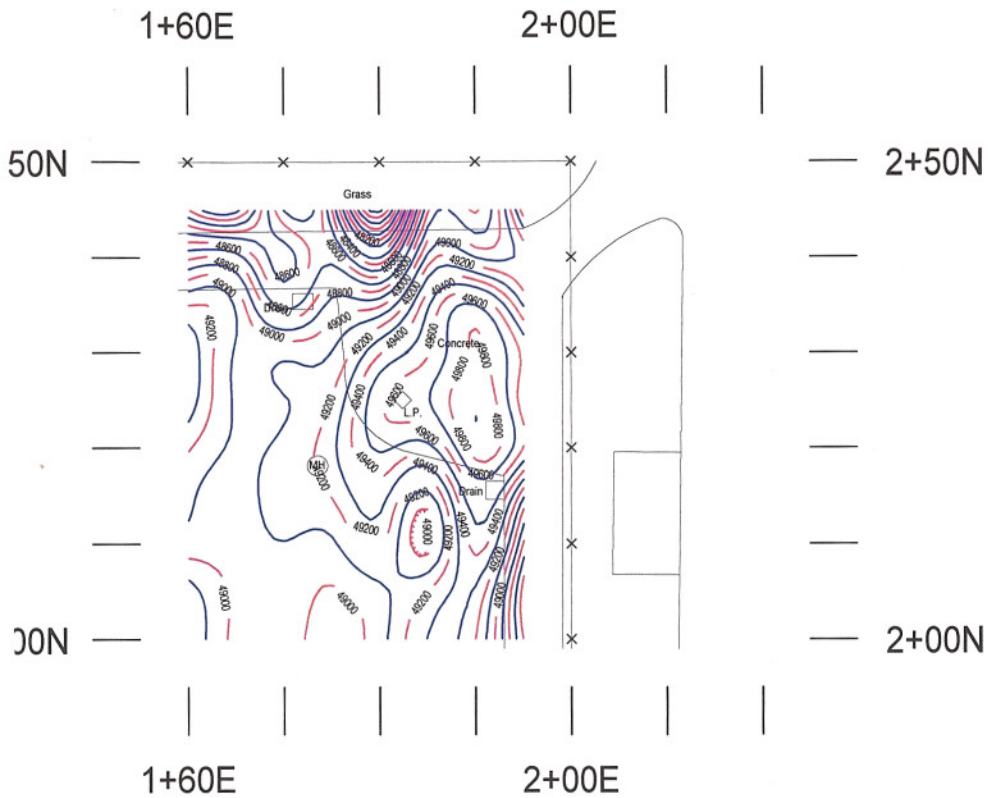
 20 10 mmoho contour interval

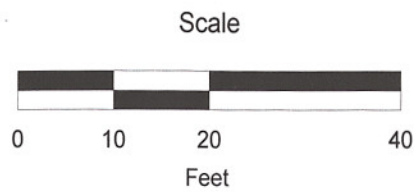
FIGURE 4  
 CONDUCTIVITY CONTOUR MAP, AREA 1  
 State Center Property Parcels  
 Baltimore, MD  
 prepared for  
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 Baltimore, MD  
 July 2010

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### Explanation

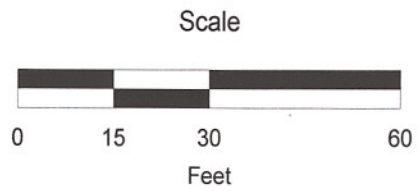
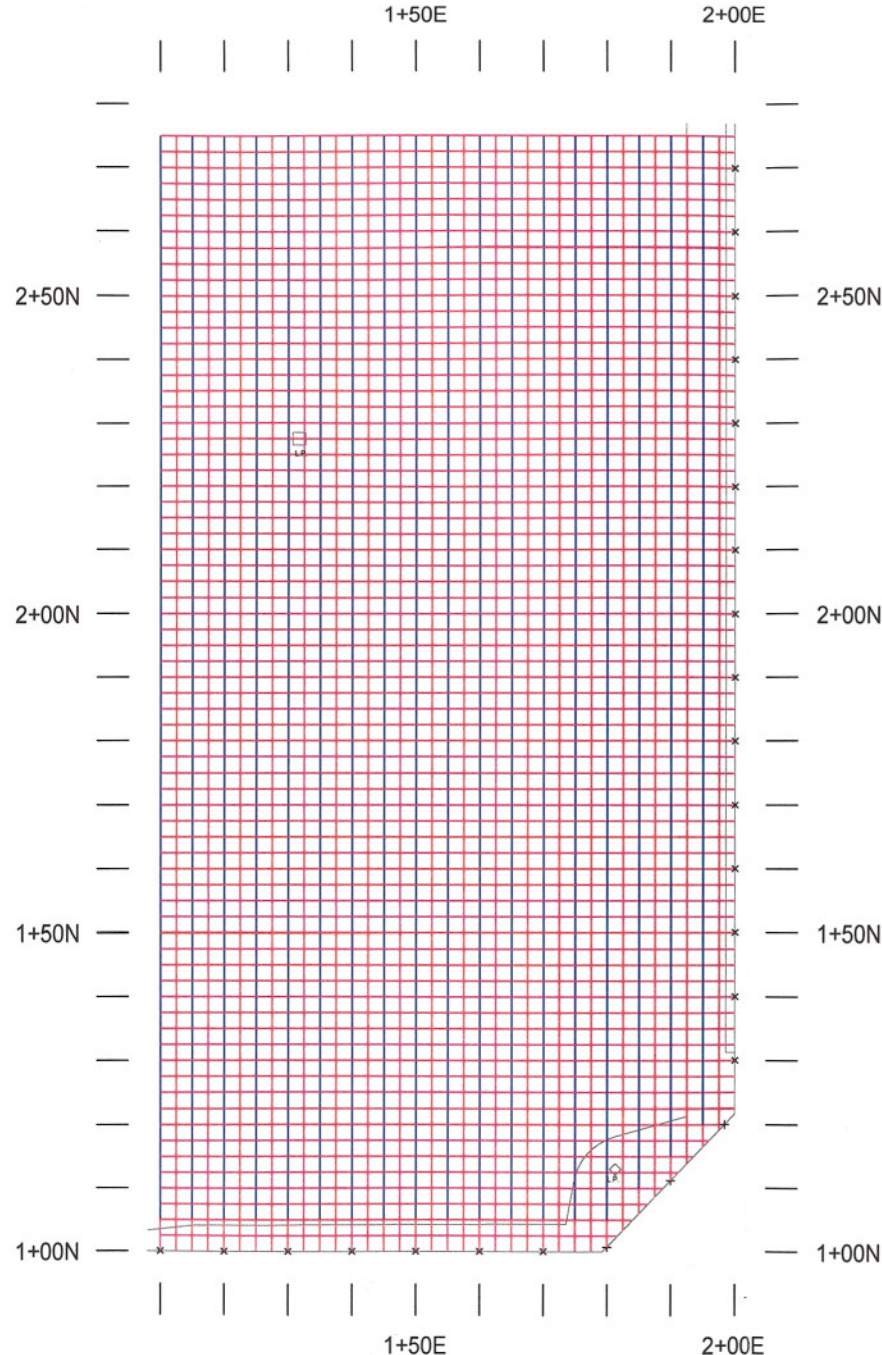
 52000 100 gamma contour interval



**FIGURE 5**  
**MAGNETIC CONTOUR MAP, AREA 1**  
State Center Property Parcels  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

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P.O. Box 388, Plumsteadville, PA 18949





### Explanation

- GPR only
- EM-31, GPR, and MAG






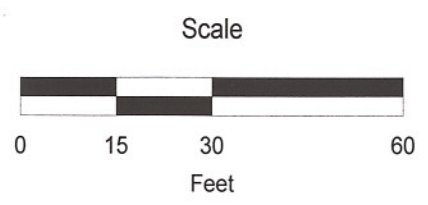
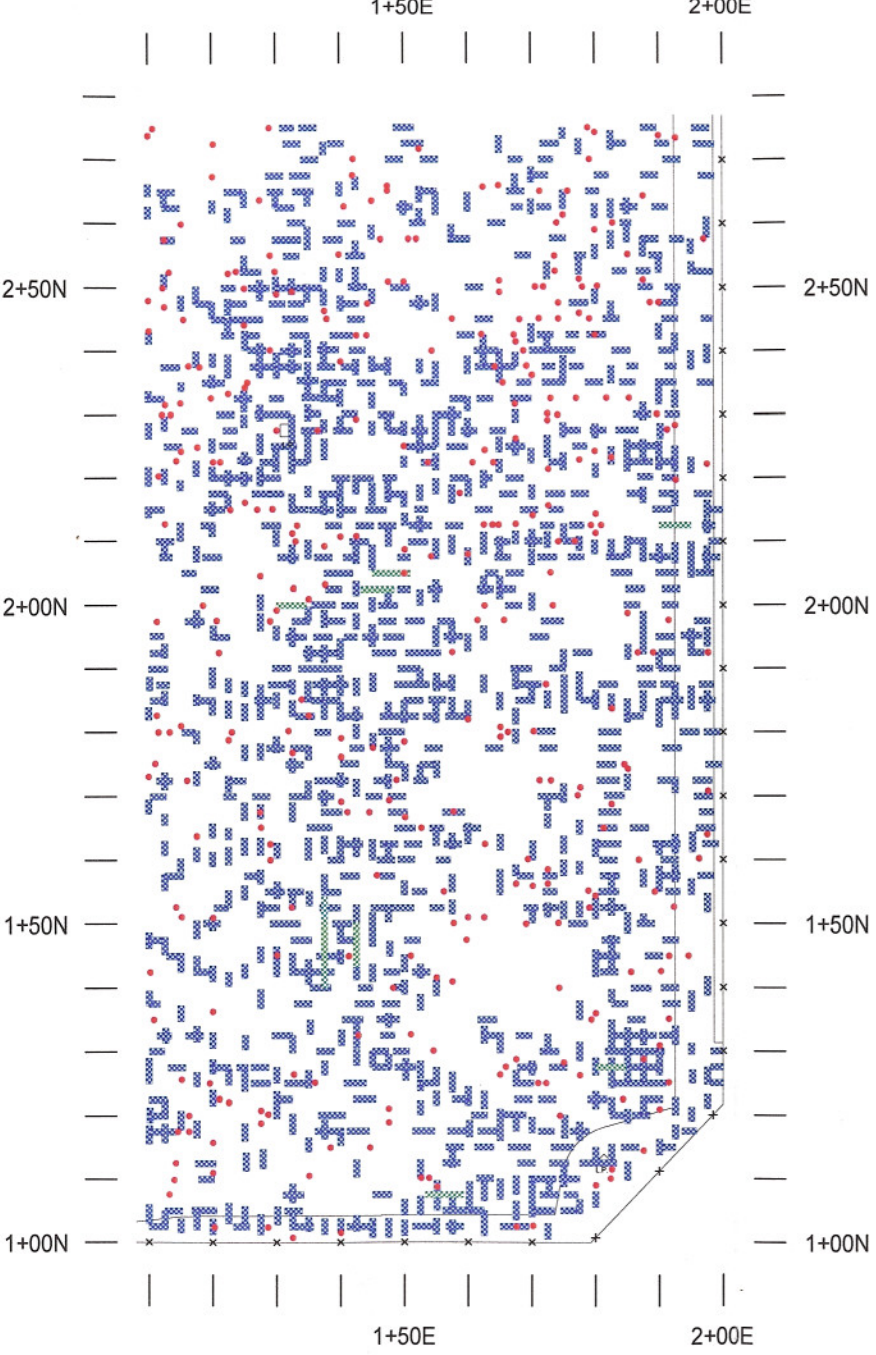
**FIGURE 6**  
**GEOPHYSICAL COVERAGE, AREA 2**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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 P.O. Box 388, Plumsteadville, PA 18949



### Explanation

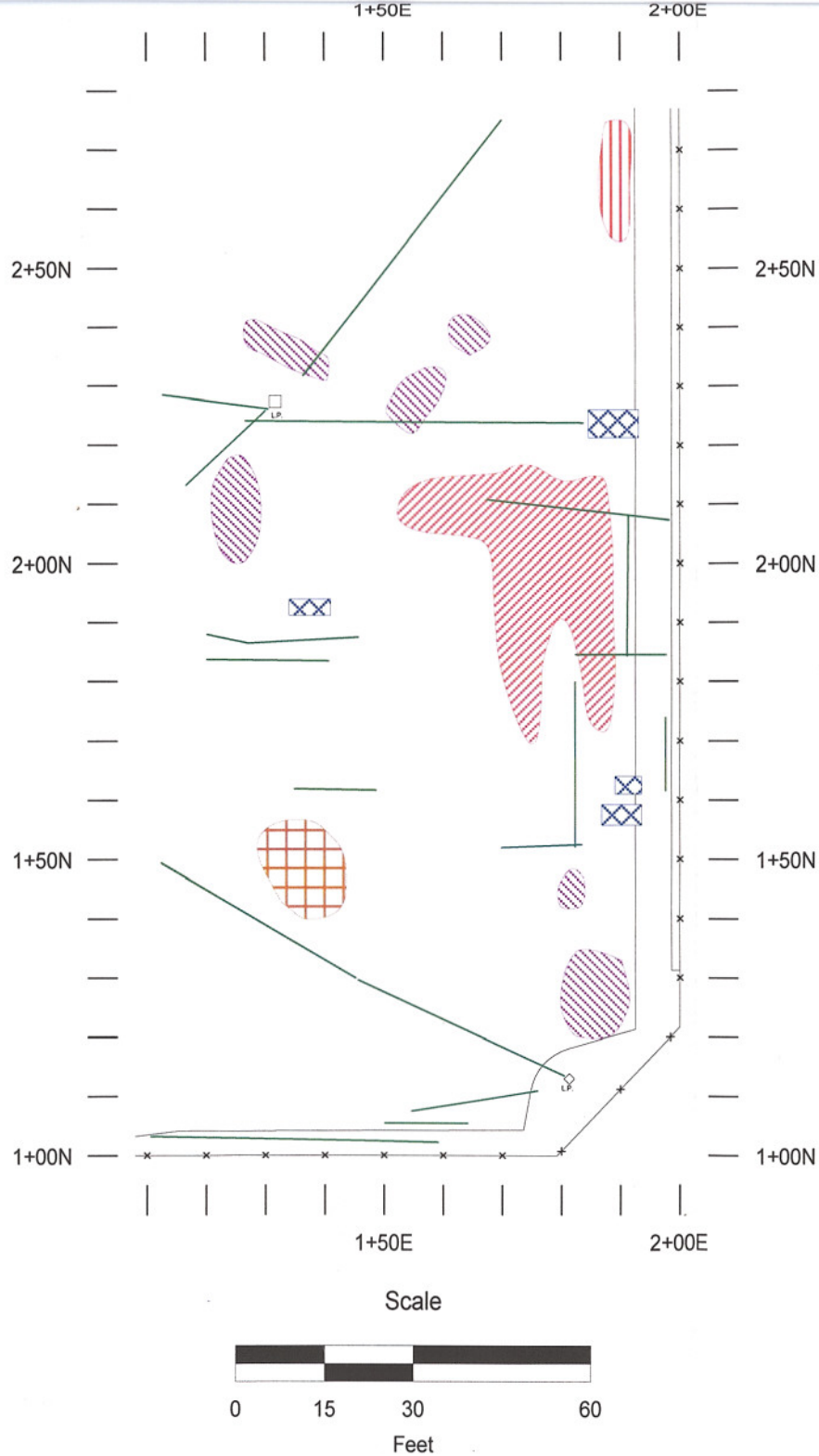
-  Point target  
( Pipe, brick, cobble, metal, etc. )
-  Larger GPR reflector
-  Possible subsurface layer









**FIGURE 7**  
**GPR ANOMALY MAP, AREA 2**  
State Center Property Parcel  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

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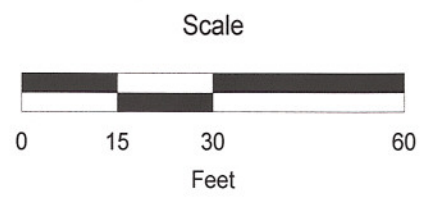
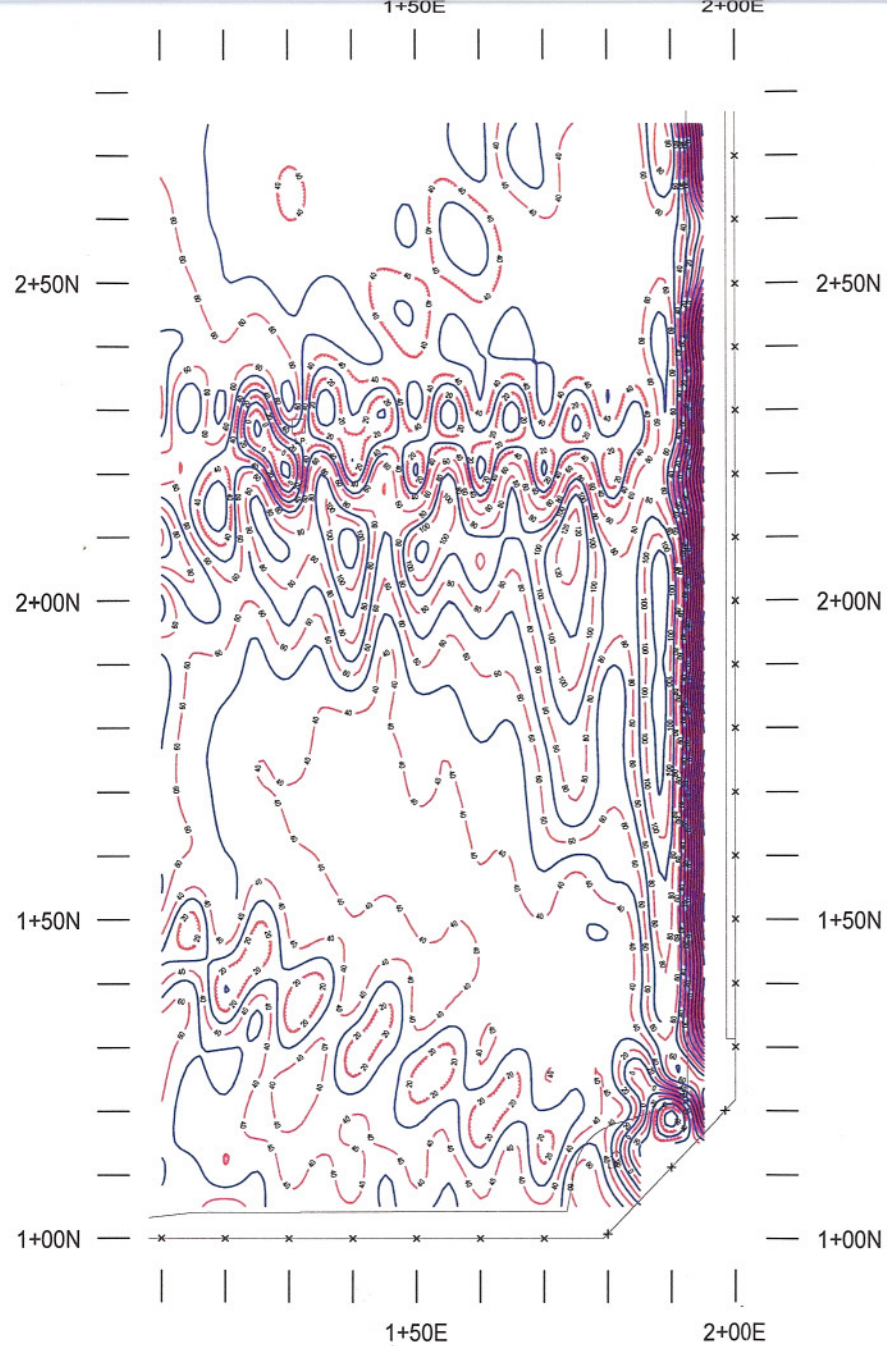


### Explanation



-  Possible pipe or utility
-  Possible pipe or tank
-  Anomalous area
-  Conductivity high
-  Magnetic high
-  Possible subsurface layer

**FIGURE 8**  
**INTERPRETATION, AREA 2**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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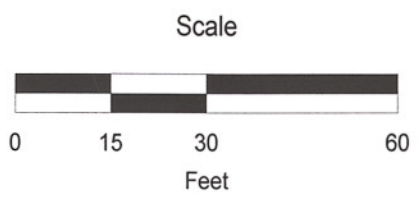
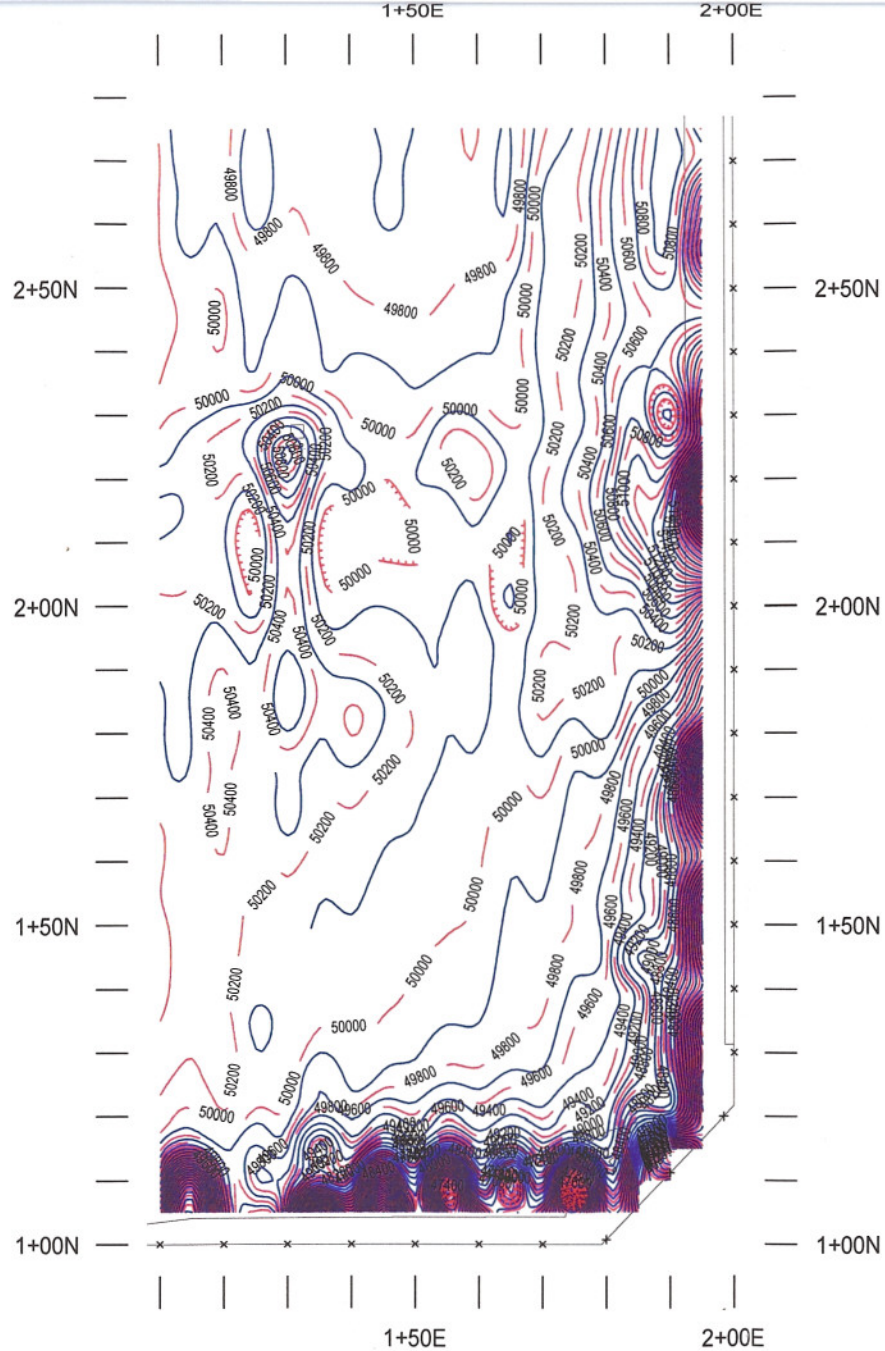
### Explanation

 20  10 mmoho contour interval



**FIGURE 9**  
**CONDUCTIVITY CONTOUR MAP, AREA 2**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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### Explanation

 52000  100 gamma contour interval

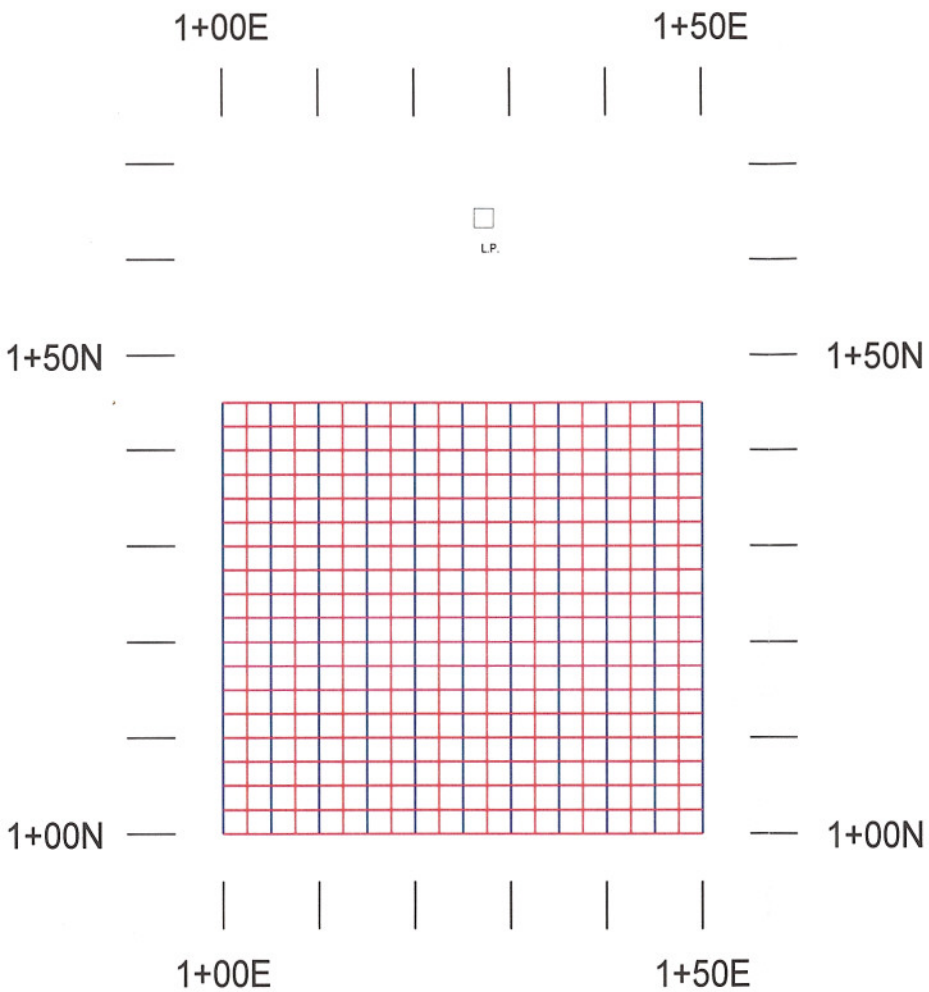


**FIGURE 10**  
**MAGNETIC CONTOUR MAP, AREA 2**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010



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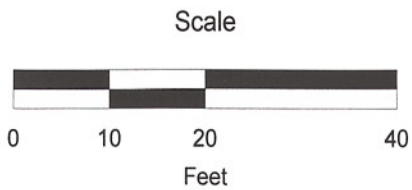
**BUCKS GEOPHYSICAL CORPORATION**  
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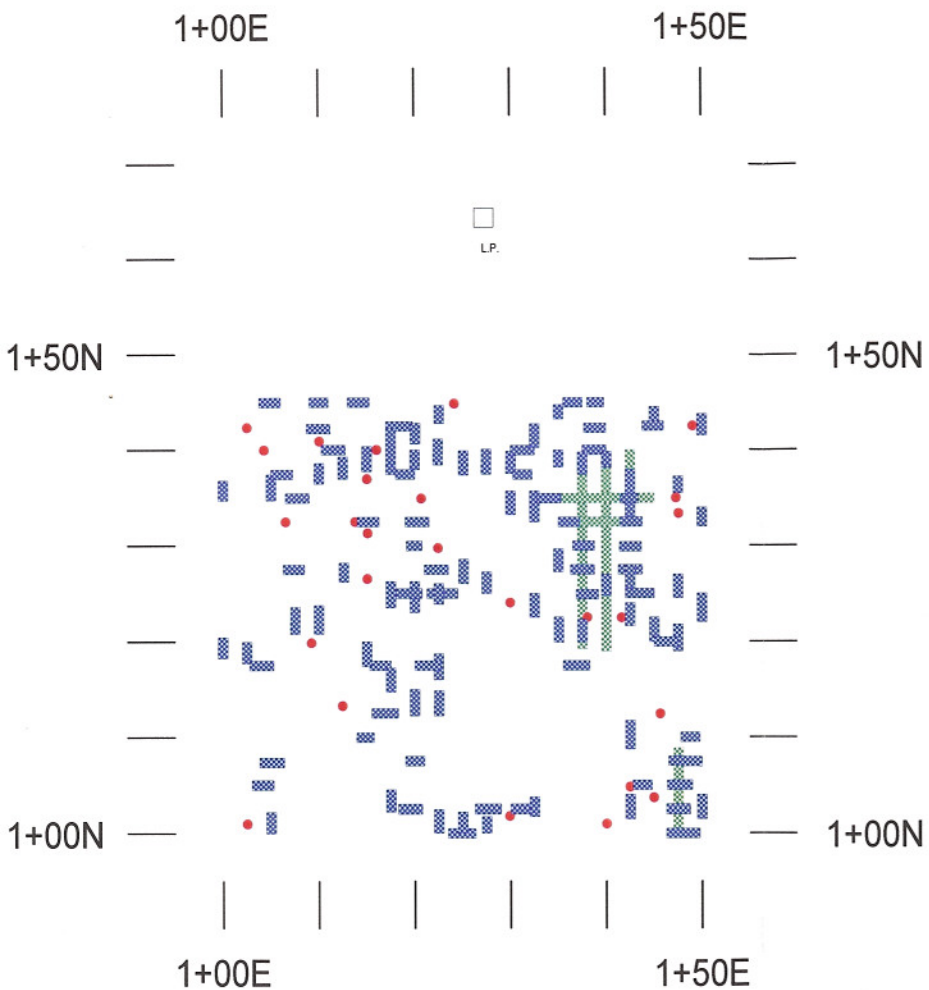
### Explanation

-  GPR only
-  EM-31, GPR, and MAG



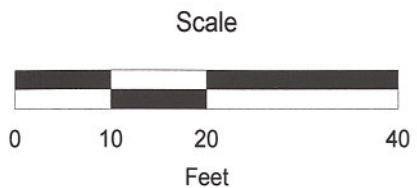
**FIGURE 11**  
**GEOPHYSICAL COVERAGE, AREA 3**  
State Center Property Parcel  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

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P.O. Box 388, Plumsteadville, PA 18949



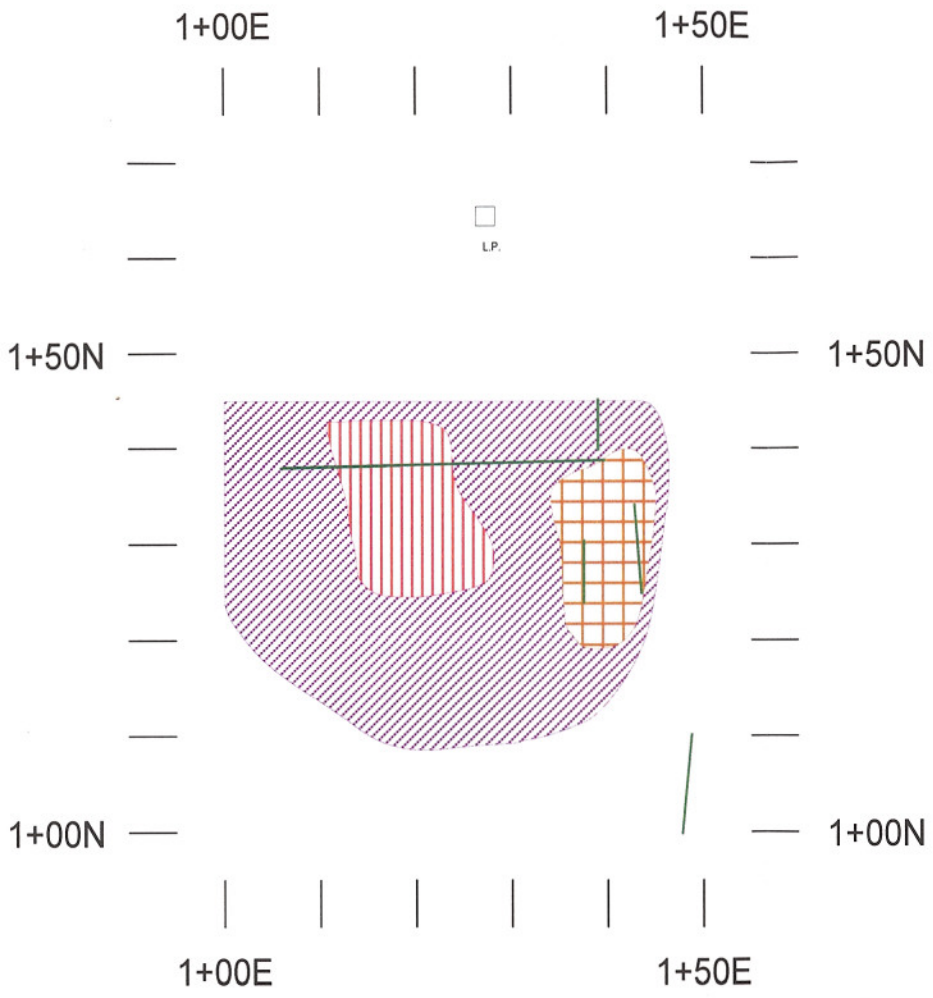
### Explanation

- Point target  
( Pipe, brick, cobble, metal, etc. )
- Larger GPR reflector
- Possible subsurface layer



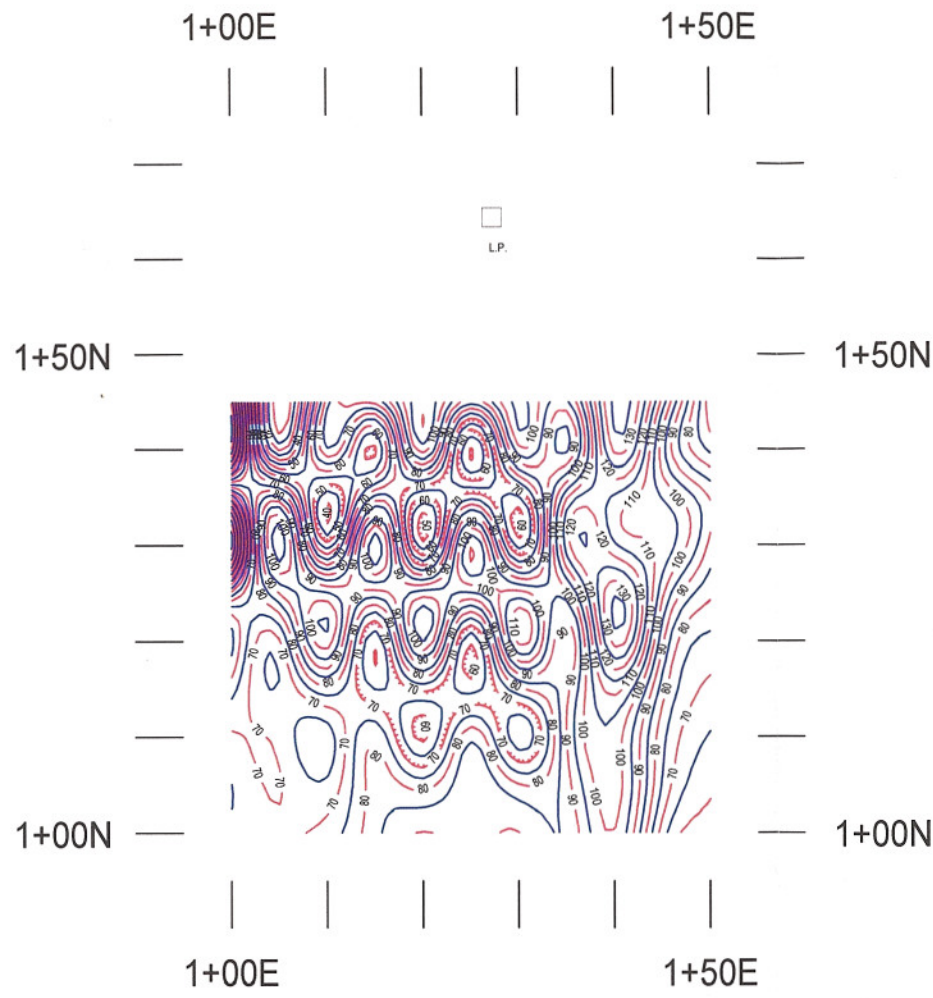
**FIGURE 12**  
**GPR ANOMALY MAP, AREA 3**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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 P.O. Box 388, Plumsteadville, PA 18949



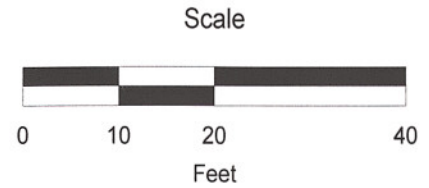
**FIGURE 13**  
**INTERPRETATION, AREA 3**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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### Explanation

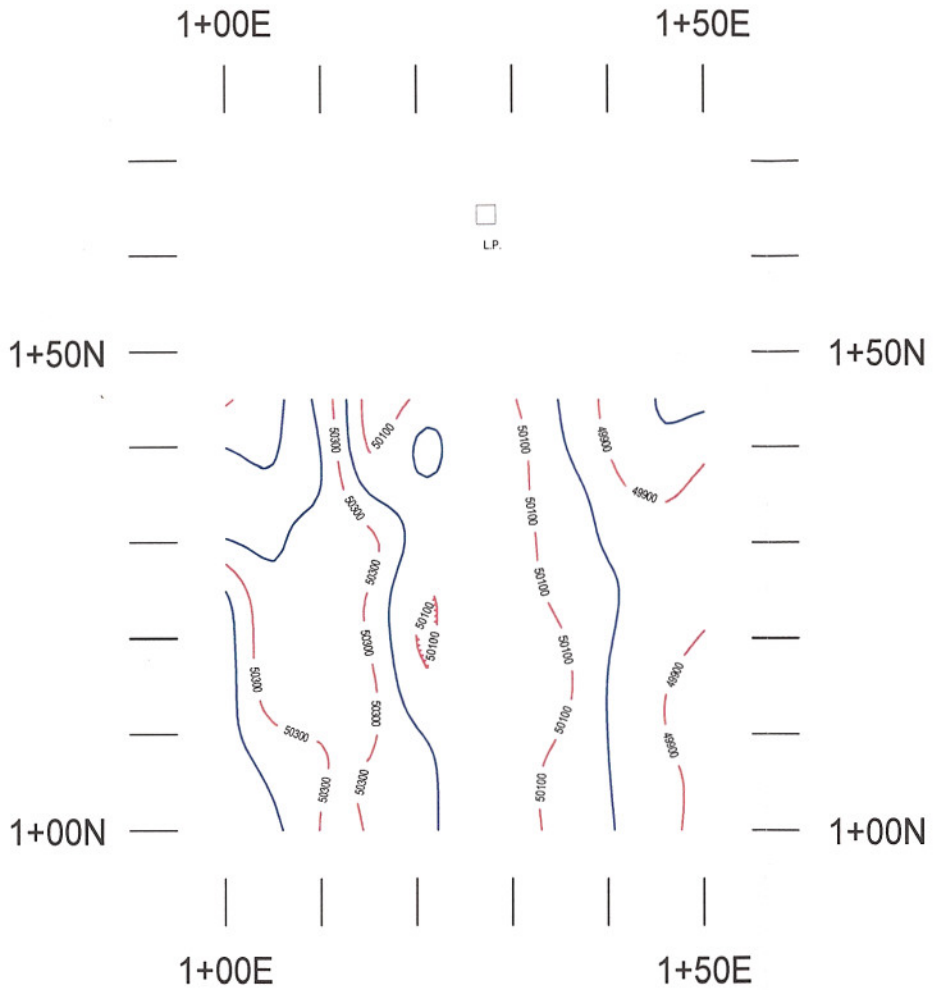
 20 5 mmoHo contour interval



**FIGURE 14**  
**CONDUCTIVITY CONTOUR MAP, AREA 3**  
State Center Property Parcel  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

**BUCKS GEOPHYSICAL CORPORATION**  
P.O. Box 388, Plumsteadville, PA 18949



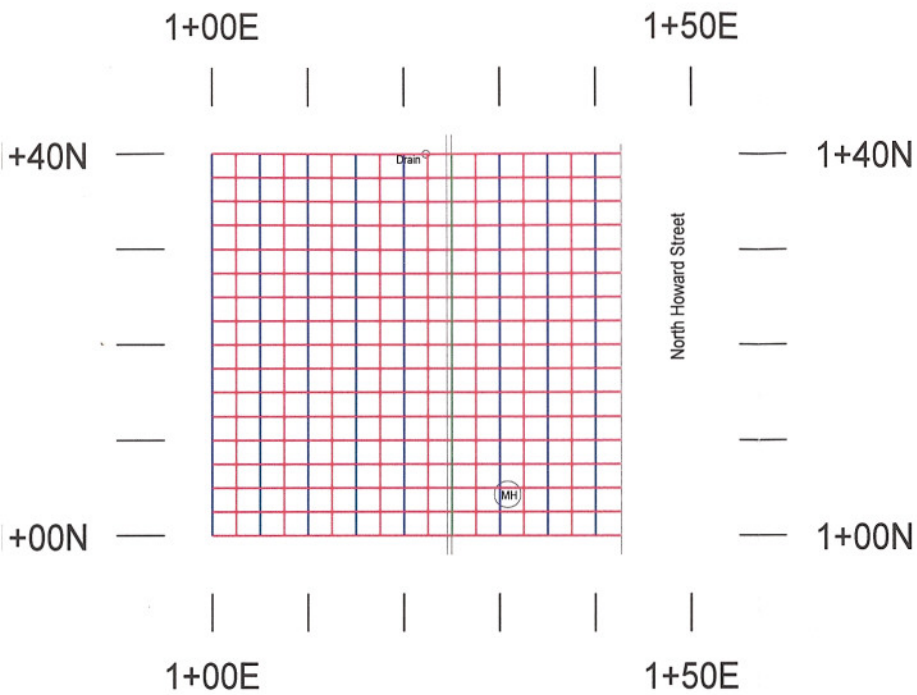


### Explanation




 52000      100 gamma contour interval

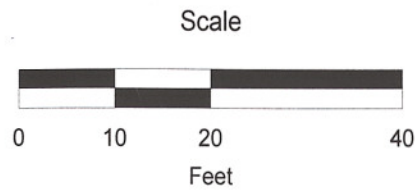
**FIGURE 15**  
**MAGNETIC CONTOUR MAP, AREA 3**  
State Center Property Parcel  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

**BUCKS GEOPHYSICAL CORPORATION**  
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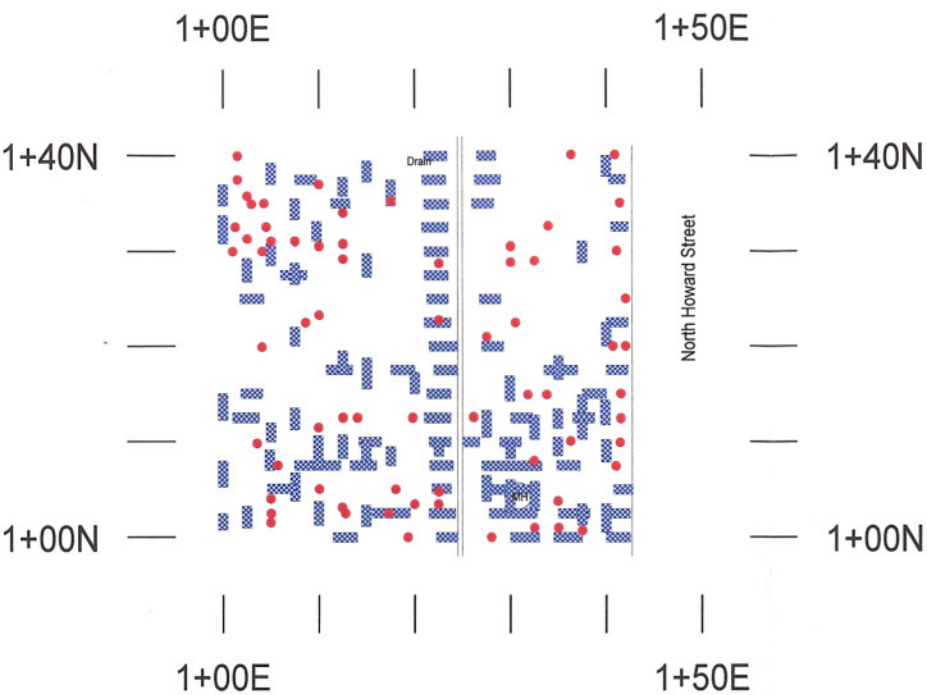
**Explanation**

-  GPR only
-  EM-31 and MAG
-  EM-31, GPR, and MAG



**FIGURE 16**  
**GEOPHYSICAL COVERAGE, AREA 4**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

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 P.O. Box 388, Plumsteadville, PA 18949



### Explanation



Point target  
( Pipe, brick, cobble, metal, etc. )



Larger GPR reflector

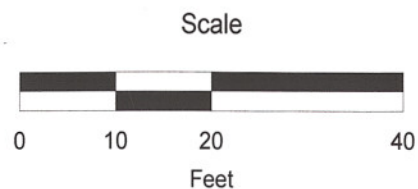
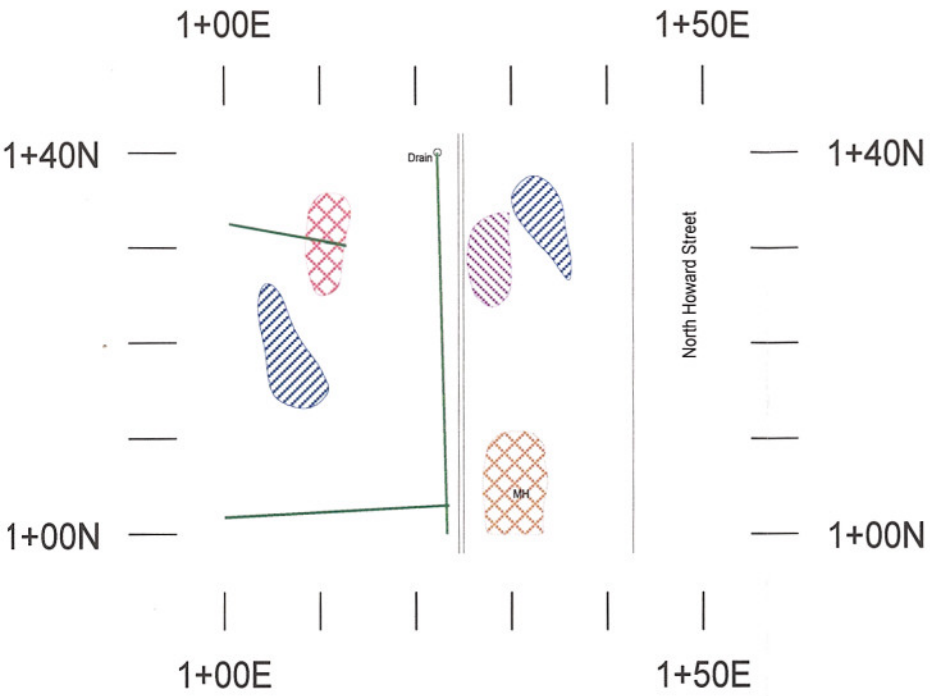







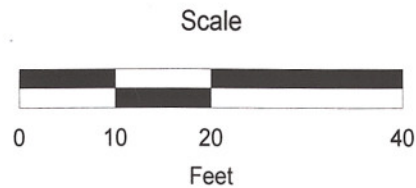
FIGURE 17  
GPR ANOMALY MAP, AREA 4  
State Center Property Parcel  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

BUCKS GEOPHYSICAL CORPORATION  
P.O. Box 388, Plumsteadville, PA 18949



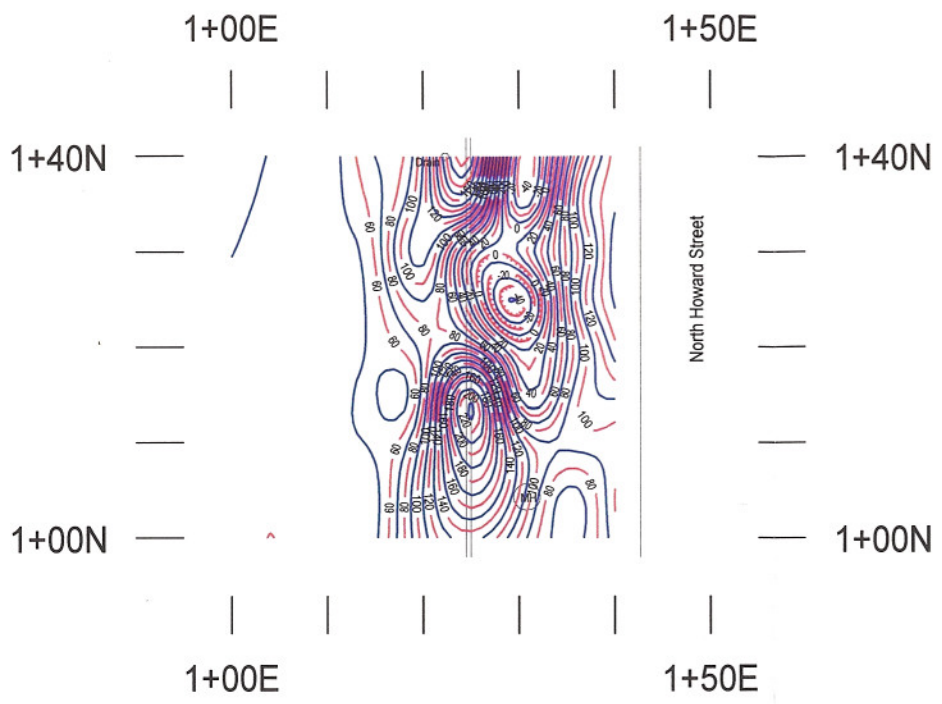
### Explanation

-  Possible pipe or utility
-  Anomalous area
-  Magnetic high
-  Magnetic low
-  Possible utility box




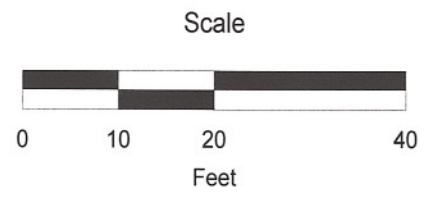
**FIGURE 18**  
**INTERPRETATION, AREA 4**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

**BUCKS GEOPHYSICAL CORPORATION**  
 P.O. Box 388, Plumsteadville, PA 18949



### Explanation

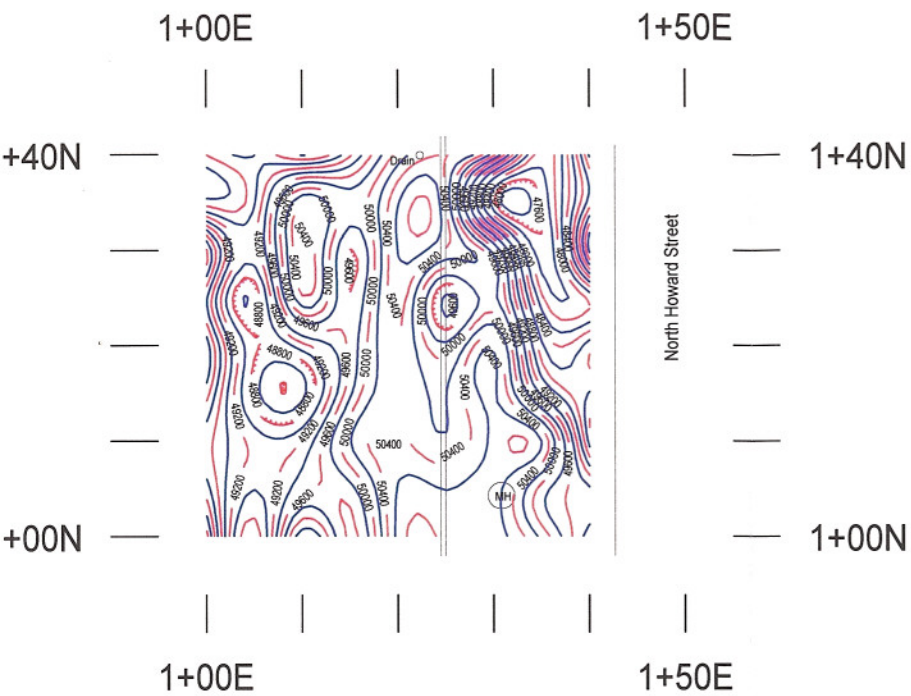
 20 10 mmoho contour interval



**FIGURE 19**  
**CONDUCTIVITY CONTOUR MAP, AREA 4**  
State Center Property Parcel  
Baltimore, MD  
prepared for  
Urban Green Environmental, LLC.  
Baltimore, MD  
July 2010

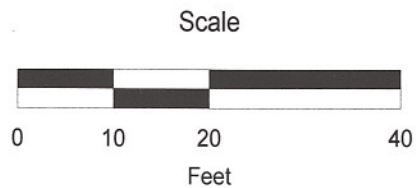
**BUCKS GEOPHYSICAL CORPORATION**  
P.O. Box 388, Plumsteadville, PA 18949





### Explanation

 52000 200 gamma contour interval



**FIGURE 20**  
**MAGNETIC CONTOUR MAP, AREA 4**  
 State Center Property Parcel  
 Baltimore, MD  
 prepared for  
 Urban Green Environmental, LLC.  
 Baltimore, MD  
 July 2010

**BUCKS GEOPHYSICAL CORPORATION**  
 P.O. Box 388, Plumsteadville, PA 18949

**APPENDIX A**



## **ELECTROMAGNETICS (EM-31)**

The EM-31 measures subsurface conductance using the principles of electromagnetic induction. The EM-31 is portable, rapid, and nondestructive. It has a fixed boom containing the transmitter and receiver coils so that handling and data gathering is easily achieved by one operator.

The EM-31 sends an alternating current into the transmitter coil. This alternating current generates an alternating primary magnetic field, which in turn induces a small alternating current in any conductive medium surrounding the transmitter coil. The alternating current in the conductive medium generates an alternating secondary magnetic field which is detected by the receiver coil. The EM-31 calculates the conductivity of the subsurface (mmhos/m) by comparing the primary field and the secondary field.

Factors which may increase subsurface conductivities include higher moisture content, greater amounts of finer materials, increased clay and/or silt content, soil contamination and/or ground water contamination. The presence of buried metal can also affect the conductivity data.

The detectability of metal objects (buried pipes, drums, etc.) can be enhanced by measuring the change in the magnitude of the primary field (inphase component) of the induced magnetic field. The change in magnitude is measured in parts per thousand (PPT). The primary field is affected mainly by metal.

Several factors can affect the effectiveness of the EM method including the proximity of cultural interferences (such as buildings, fences and reinforced concrete), the presence of highly conductive materials (such as clays and water), and the size, depth, and conductivity contrast of the target.

## **GROUND PENETRATING RADAR**

Some of the uses of GPR include locating buried tanks and drums, delineating boundaries of landfills and trenches, and defining voids and geologic stratigraphy. Although other techniques can also provide this information, GPR is less affected by cultural interferences such as overhead power lines, buildings, and fences. GPR can also provide higher resolution of the target in many cases.

The antenna can either be moved manually by an operator or towed by a vehicle. Depths of exploration can vary widely, from just a few feet in water saturated clayey materials to hundreds of feet in glacial ice. A variety of antennas (ranging from 80 to 900 Mhz) can be used depending on subsurface conditions and the objective of the survey. Resolution of shallow objects requires higher frequencies, while lower frequencies work better for deeper investigations.

The profile recorder supplies the power and synchronizing signals to the antenna. The antenna outputs a pulse of electromagnetic energy to the ground. The energy pulse is reflected by geologic layers or objects under the surface back to the antenna. The antenna converts the pulse (nanoseconds in duration) to an analog signal (tens of milliseconds in duration) back to the radar unit. The signal is then processed and sent to a graphic recorder which creates a continuous profile of the subsurface reflectors.

Several factors can affect the effectiveness of the GPR method including reinforced concrete at the surface, the presence of highly conductive materials (such as clays and water), the size, depth, and physical property of the target and in stratigraphic investigations, the conductivity contrast between stratigraphic units. The presence of numerous buried objects may mask objects and/or stratigraphy below them.

## **MAGNETOMETER**

A magnetometer is a rapid, effective and non-destructive instrument used to locate buried ferrous material (drums, pipes, mineral deposits, archaeological objects, etc.). The instrument is operated and carried by one person, and contains a digital memory for data storage.

The proton magnetometer utilizes the precession of spinning protons to measure the intensity of the earth's magnetic field. The protons act as small magnetic dipoles. A coil is charged with an electrical current which creates a magnetic field, which temporarily aligns the protons with respect to the coil. The current is then removed, and the protons spin in the direction of the earth's magnetic field. As the protons spin they generate a small electrical signal, which is measured and converted into a value of magnetic intensity (gammas) by the magnetometer. The intensity of the earth's magnetic field is affected by ferrous material.

Interpretation of magnetometer data includes recognizing and characterizing local changes in the intensity of the earth's magnetic field. Analysis usually involves contouring and profiling the data. The size, shape, and magnitude of an anomaly depends on the mass, orientation and depth of the buried target (drums, mineral deposits, etc.). Modeling of the data can provide a rough estimate of the mass and depth of the target, but is usually reserved for large-scale geological surveys.

Several factors can limit the effectiveness of the magnetometry method including the proximity of cultural interferences (such as buildings, fences, and reinforced concrete), and the size, depth and magnetic susceptibility of the target.

## Chain of Custody Record

<b>Customer:</b>	Urban Green Environment
<b>Contact/Report to:</b>	Denise A Sullivan
<b>Phone:</b>	410-244-7215
<b>Fax:</b>	410-685-0226

<b>E-mail address:</b>	denise@ugenv.com
<b>Project Name:</b>	State Center - Parcel I2
<b>Project Number:</b>	016-007-10
<b>Site Location:</b>	Baltimore City

<b>SDG Number:</b>	10080204
<b>Sampled by:</b>	WDH
<b>PO Number:</b>	016-007-10
<b>Page</b>	<u>1</u> of <u>1</u>

### Analysis Requested

Lab Number	Field Sample ID	Date Sampled	Time Sampled	No. of Bottles	Matrix *	Preservative						Sampling Remarks/ Comments
						VOCs	SVOCs (SIM)	PPL Metals	Pesticides	Herbicides	PCBs	
	COMP 13.14.15 0-1	07/31/10	1420	2	S		x	x	x	x	x	
	COMP 13.14.15 4-5	07/31/10	1420	1	S		x	x	x	x	x	1/28 8/2/10
	SB-17 4-5	07/31/10	1445	2 encores	S	x						

<b>Relinquished by:</b>	<i>Bill Harmon</i>	<b>Date/Time:</b>	8/2/10 1150	<b>Deliverables:</b>	<b>Receipt Temperature:</b>	<b>Turnaround Time:</b>
<b>Received by:</b>	<i>Matt Colue</i>	<b>Date/Time:</b>	8/2/10 1150	I II III CLP EDD	Temp: <u>On Ice</u>	<u>STB</u> Next Day 2-Day Other
<b>Relinquished by:</b>		<b>Date/Time:</b>		<b>Custody Seals:</b>	<b>Comments/Special Instructions:</b>	
<b>Received by:</b>		<b>Date/Time:</b>		Sample Cooler		
<b>Relinquished by:</b>		<b>Date/Time:</b>		Delivered by client		
<b>Received by:</b>		<b>Date/Time:</b>				

\* W = Water; WW = Wastewater; GW = Groundwater; S = Soil; SL = Sludge

**APPENDIX B**  
SOIL BORING LOGS











**APPENDIX C**  
LABORATORY ANALYTICAL REPORT



# CALIBER ANALYTICAL SERVICES

## Certificate of Analysis

Urban Green Environmental  
3634 Beech Ave.  
Baltimore, MD 21211

Date Sampled: 07/31/10 14:20  
Date Received: 08/02/10 11:50  
Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID: COMP 13.14.15 0-1 Matrix: Soil Lab ID: 10080204-01

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
<b>Chlorinated Herbicides</b>							
Dicamba	ND	ug/kg	23	EPA 8151A	08/09/10	08/11/10 13:19	AC
MCPPP	ND	ug/kg	2300	EPA 8151A	08/09/10	08/11/10 13:19	AC
MCPA	ND	ug/kg	2300	EPA 8151A	08/09/10	08/11/10 13:19	AC
Dichloroprop	ND	ug/kg	23	EPA 8151A	08/09/10	08/11/10 13:19	AC
2,4-D	ND	ug/kg	23	EPA 8151A	08/09/10	08/11/10 13:19	AC
2,4,5-TP (Silvex)	ND	ug/kg	23	EPA 8151A	08/09/10	08/11/10 13:19	AC
2,4,5-T	ND	ug/kg	23	EPA 8151A	08/09/10	08/11/10 13:19	AC
Dinoseb	ND	ug/kg	23	EPA 8151A	08/09/10	08/11/10 13:19	AC
2,4-DB	ND	ug/kg	23	EPA 8151A	08/09/10	08/11/10 13:19	AC
<b>Organochlorine Pesticides</b>							
Aldrin	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
a-BHC	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
b-BHC	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
g-BHC (Lindane)	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
d-BHC	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
a-Chlordane	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
g-Chlordane	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
4,4-DDD	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
4,4-DDE	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
4,4-DDT	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Dieldrin	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Endosulfan I	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Endosulfan II	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Endosulfan Sulfate	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Endrin	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Endrin Aldehyde	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Endrin Ketone	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Heptachlor	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Heptachlor Epoxide	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Methoxychlor	ND	ug/kg	11	EPA 8081A	08/04/10	08/09/10 15:28	AC
Toxaphene	ND	ug/kg	110	EPA 8081A	08/04/10	08/09/10 15:28	AC
<b>Percent Solids</b>							
Percent Solids	88	%		SM2540G	08/03/10	08/03/10 15:38	LMJ
<b>Polychlorinated Biphenyls</b>							
Aroclor 1016	ND	mg/kg	0.056	EPA 8082	08/05/10	08/09/10 12:53	AC
Aroclor 1221	ND	mg/kg	0.056	EPA 8082	08/05/10	08/09/10 12:53	AC
Aroclor 1232	ND	mg/kg	0.056	EPA 8082	08/05/10	08/09/10 12:53	AC
Aroclor 1242	ND	mg/kg	0.056	EPA 8082	08/05/10	08/09/10 12:53	AC
Aroclor 1248	ND	mg/kg	0.056	EPA 8082	08/05/10	08/09/10 12:53	AC



# CALIBER ANALYTICAL SERVICES

## Certificate of Analysis

Urban Green Environmental  
3634 Beech Ave.  
Baltimore, MD 21211

Date Sampled: 07/31/10 14:20  
Date Received: 08/02/10 11:50  
Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID: COMP 13.14.15 0-1 Matrix: Soil Lab ID: 10080204-01

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
<b>Polychlorinated Biphenyls</b>							
Aroclor 1254	ND	mg/kg	0.056	EPA 8082	08/05/10	08/09/10 12:53	AC
Aroclor 1260	ND	mg/kg	0.056	EPA 8082	08/05/10	08/09/10 12:53	AC

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
<b>Polycyclic Aromatic Hydrocarbons (SIM)</b>							
Acenaphthene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Acenaphthylene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Anthracene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Benzo[a]anthracene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Benzo[a]pyrene	6	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Benzo[b]fluoranthene	7	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Benzo[g,h,i]perylene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Benzo[k]fluoranthene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Chrysene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Dibenz[a,h]anthracene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Fluoranthene	5	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Fluorene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Indeno[1,2,3-cd]pyrene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
2-Methylnaphthalene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Naphthalene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Phenanthrene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS
Pyrene	7	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:04	CBS

<b>Target Compound List - SEMIVOLATILES</b>							
	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Phenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Bis (2-chloroethyl) ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
2-Chlorophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
2-Methylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Bis (2-chloroisopropyl) ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Acetophenone	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
4-Methylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
N-Nitroso-di-n-propylamine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Hexachloroethane	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Nitrobenzene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Isophorone	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
2-Nitrophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
2,4-Dimethylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Bis (2-chloroethoxy) methane	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
2,4-Dichlorophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
4-Chloroaniline	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Hexachlorobutadiene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS
Caprolactam	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59	CBS





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Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID: COMP 13.14.15 0-1 Matrix: Soil Lab ID: 10080204-01

Result Unit LLQ Method Prepared Analyzed Init.

### Target Compound List - SEMIVOLATILES

Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
4-Chloro-3-methylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Hexachlorocyclopentadiene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
2,4,6-Trichlorophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
2,4,5-Trichlorophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 14:59 CBS
1,1-Biphenyl	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
2-Chloronaphthalene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
2-Nitroaniline	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Dimethyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
2,6-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
3-Nitroaniline	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 14:59 CBS
2,4-Dinitrophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 14:59 CBS
4-Nitrophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Dibenzofuran	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
2,4-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Diethyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
4-Chlorophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
4-Nitroaniline	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 14:59 CBS
4,6-Dinitro-2-methylphenol	ND	ug/kg	230	EPA 8270C	08/09/10	08/10/10 14:59 CBS
N-Nitrosodiphenylamine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
4-Bromophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Hexachlorobenzene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Atrazine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Pentachlorophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Carbazole	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Di-n-butyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Butyl benzyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
3,3-Dichlorobenzidine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Bis (2-ethylhexyl) phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS
Di-n-octyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 14:59 CBS

### Total Metals

Antimony	ND	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Arsenic	4.6	mg/kg	0.55	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Beryllium	ND	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Cadmium	ND	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Chromium	120	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Copper	170	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Lead	170	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Mercury	ND	mg/kg	0.11	EPA 6020A	08/04/10	08/04/10 14:44 MEL
Nickel	6.4	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44 MEL



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Urban Green Environmental  
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Date Sampled: 07/31/10 14:20  
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Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID:	COMP 13.14.15 0-1	Matrix:	Soil	Lab ID:	10080204-01			
	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.	
<b>Total Metals</b>								
Selenium	ND	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44	MEL	
Silver	ND	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44	MEL	
Thallium	ND	mg/kg	2.2	EPA 6020A	08/04/10	08/04/10 14:44	MEL	
Zinc	<b>24</b>	mg/kg	2.7	EPA 6020A	08/04/10	08/04/10 14:44	MEL	

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation  
ND - Not Detected at a concentration greater than or equal to the LLQ.  
Results reported on a dry weight basis.

Approved by:

QC Chemist



# CALIBER ANALYTICAL SERVICES

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3634 Beech Ave.  
Baltimore, MD 21211

Date Sampled: 07/31/10 14:20  
Date Received: 08/02/10 11:50  
Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID:	COMP 13.14.15 4-5	Matrix:	Soil	Lab ID:	10080204-02		
	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
<b>Percent Solids</b>							
Percent Solids	90	%		SM2540G	08/03/10	08/03/10 15:38	LMJ
<b>Polycyclic Aromatic Hydrocarbons (SIM)</b>							
Acenaphthene	ND	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Acenaphthylene	53	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Anthracene	26	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Benzo[a]anthracene	78	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Benzo[a]pyrene	190	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Benzo[b]fluoranthene	210	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Benzo[g,h,i]perylene	110	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Benzo[k]fluoranthene	100	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Chrysene	91	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Dibenz[a,h]anthracene	31	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Fluoranthene	100	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Fluorene	6	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Indeno[1,2,3-cd]pyrene	100	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
2-Methylnaphthalene	8	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Naphthalene`	11	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Phenanthrene	52	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
Pyrene	160	ug/kg	5	EPA 8270C	08/09/10	08/10/10 0:46	CBS
<b>Target Compound List - SEMIVOLATILES</b>							
Phenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Bis (2-chloroethyl) ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
2-Chlorophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
2-Methylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Bis (2-chloroisopropyl) ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Acetophenone	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
4-Methylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
N-Nitroso-di-n-propylamine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Hexachloroethane	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Nitrobenzene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Isophorone	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
2-Nitrophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
2,4-Dimethylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Bis (2-chloroethoxy) methane	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
2,4-Dichlorophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
4-Chloroaniline	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Hexachlorobutadiene`	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
Caprolactam	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS
4-Chloro-3-methylphenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42	CBS



# CALIBER ANALYTICAL SERVICES

## Certificate of Analysis

Urban Green Environmental  
3634 Beech Ave.  
Baltimore, MD 21211

Date Sampled: 07/31/10 14:20  
Date Received: 08/02/10 11:50  
Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID: COMP 13.14.15 4-5 Matrix: Soil Lab ID: 10080204-02

Result Unit LLQ Method Prepared Analyzed Init.

### Target Compound List - SEMIVOLATILES

Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Hexachlorocyclopentadiene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
2,4,6-Trichlorophenol	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
2,4,5-Trichlorophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 15:42 CBS
1,1-Biphenyl	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
2-Chloronaphthalene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
2-Nitroaniline	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Dimethyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
2,6-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
3-Nitroaniline	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 15:42 CBS
2,4-Dinitrophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 15:42 CBS
4-Nitrophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Dibenzofuran	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
2,4-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Diethyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
4-Chlorophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
4-Nitroaniline	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 15:42 CBS
4,6-Dinitro-2-methylphenol	ND	ug/kg	230	EPA 8270C	08/09/10	08/10/10 15:42 CBS
N-Nitrosodiphenylamine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
4-Bromophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Hexachlorobenzene	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Atrazine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Pentachlorophenol	ND	ug/kg	250	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Carbazole	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Di-n-butyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Butyl benzyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
3,3-Dichlorobenzidine	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Bis (2-ethylhexyl) phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS
Di-n-octyl phthalate	ND	ug/kg	100	EPA 8270C	08/09/10	08/10/10 15:42 CBS

### Total Metals

Antimony	ND	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Arsenic	0.92	mg/kg	0.52	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Beryllium	ND	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Cadmium	ND	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Chromium	12	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Copper	ND	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Lead	3.6	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Mercury	ND	mg/kg	0.1	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Nickel	ND	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL
Selenium	ND	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50 MEL



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3634 Beech Ave.  
Baltimore, MD 21211

Date Sampled: 07/31/10 14:20  
Date Received: 08/02/10 11:50  
Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID:	COMP 13.14.15 4-5			Matrix:	Soil	Lab ID: 10080204-02		
	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.	
<b>Total Metals</b>								
Silver	ND	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50	MEL	
Thallium	ND	mg/kg	2.1	EPA 6020A	08/04/10	08/04/10 14:50	MEL	
Zinc	7.7	mg/kg	2.6	EPA 6020A	08/04/10	08/04/10 14:50	MEL	

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation  
ND - Not Detected at a concentration greater than or equal to the LLQ.  
Results reported on a dry weight basis.

Approved by:

QC Chemist





# CALIBER ANALYTICAL SERVICES

## Certificate of Analysis

Urban Green Environmental  
3634 Beech Ave.  
Baltimore, MD 21211

Date Sampled: 07/31/10 14:45  
Date Received: 08/02/10 11:50  
Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID:	SB-17 4-5	Matrix:	Soil	Lab ID:	10080204-03		
	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
<b>Percent Solids</b>							
Percent Solids	91	%		SM2540G	08/03/10	08/03/10 15:38	LMJ
<b>Target Compound List - VOLATILES</b>							
Dichlorodifluoromethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Chloromethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Vinyl chloride	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Bromomethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Chloroethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Trichlorofluoromethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,1-Dichloroethene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Acetone	ND	ug/kg	49	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Carbon disulfide	ND	ug/kg	10	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Methyl acetate	ND	ug/kg	25	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Methylene chloride	ND	ug/kg	25	EPA 8260B	08/03/10	08/03/10 17:01	JKL
trans-1,2-Dichloroethene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Methyl t-butyl ether (MTBE)	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,1-Dichloroethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
cis-1,2-Dichloroethene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
2-Butanone (MEK)	ND	ug/kg	49	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Chloroform	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,1,1-Trichloroethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Cyclohexane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Carbon tetrachloride	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Benzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,2-Dichloroethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Trichloroethene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Methylcyclohexane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,2-Dichloropropane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Bromodichloromethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
cis-1,3-Dichloropropene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	10	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Toluene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
trans-1,3-Dichloropropene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,1,2-Trichloroethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Tetrachloroethene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
2-Hexanone (MBK)	ND	ug/kg	10	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Dibromochloromethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,2-Dibromoethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Chlorobenzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL



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Date Sampled: 07/31/10 14:45  
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Date Issued: 08/12/10

Project: State Center - Parcel 12  
Site Location: Baltimore City  
Project Number: 016-007-10

SDG Number: 10080204

Field Sample ID:	SB-17 4-5	Matrix:	Soil	Lab ID:	10080204-03		
	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
<b>Target Compound List - VOLATILES</b>							
Ethylbenzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
m&p-Xylene	ND	ug/kg	10	EPA 8260B	08/03/10	08/03/10 17:01	JKL
o-Xylene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Styrene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Bromoform	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Isopropylbenzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,3-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,4-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,2-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,2-Dibromo-3-chloropropane	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
1,2,4-Trichlorobenzene	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Naphthalene	ND	ug/kg	10	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Ethyl t-butyl ether (ETBE)	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
tert-Butanol (TBA)	ND	ug/kg	25	EPA 8260B	08/03/10	08/03/10 17:01	JKL
Diisopropyl ether (DIPE)	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
tert-Amyl methyl ether (TAME)	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL
tert-Amyl alcohol (TAA)	ND	ug/kg	25	EPA 8260B	08/03/10	08/03/10 17:01	JKL
tert-Amyl ethyl ether (TAE)	ND	ug/kg	5	EPA 8260B	08/03/10	08/03/10 17:01	JKL

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

ND - Not Detected at a concentration greater than or equal to the LLQ.

Results reported on a dry weight basis.

Approved by:

QC Chemist