

**February 9, 2007**

# **HAZARDOUS MATERIALS HEALTH & SAFETY PLAN**

**Atlantic Yards Arena and Redevelopment Project  
Brooklyn, New York**

**Forest City Ratner Companies**

# **Hazardous Materials Health & Safety Plan (HASP)**

## **Section A-1: Project Safety Orientation**

### **I. Policy Statement**

A critical component of a successful Safety and Health program begins on the first day an employee begins with a company. It is the policy of the Construction Manager that all employees will receive a Safety and Health Orientation prior to beginning work. Everyone working on project shall receive project specific safety orientation prior to entering the project site.

### **II. Emergency and Project Management Contact Information**

Provided below is a list of telephone numbers for use in the event of an emergency onsite.

Emergency Medical Service.....	911
<u>Police</u> : New York City Police Department (NYPD) .....	911
<u>Hospital</u> : Brooklyn Hospital Center.....	(718) 250-8000
National Response Center .....	(800) 424-8802
Poison Control Center .....	(800) 222-1222
Chemtrec .....	(800) 262-8200
<u>Fire</u> : New York City Fire Department (FDNY) .....	911
New York City Office of Emergency Management .....	911
Center for Disease Control .....	(800) 311-3435
USEPA (Region II) .....	(212) 637-5000
NYSDEC Emergency Spill Response .....	(800) 457-7362
NYCDEP.....	(718) 595-4646
Project Field Office Trailer.....	TBD

### **III. Hospital Information and Directions to Brooklyn Hospital Center**

Brooklyn Hospital Center

121 Dekalb Avenue  
Brooklyn, New York  
(718) 250-8000

Directions to Brooklyn Hospital Center

- 1) Head towards Carlton Ave on Atlantic Avenue
- 2) Turn North onto Carlton Avenue (make right turn from Atlantic Avenue)
- 3) Turn Left onto Dekalb Avenue
- 4) Hospital will be on right hand side after 6 blocks (121 Dekalb Avenue)

Directions to the hospital and a local area map are included as Figure 1.

## **Section A-2: Project Safety Staff Responsibilities**

### **I. Health and Safety Staff**

This section briefly describes the health and safety responsibilities for the redevelopment work to be implemented at the Site. The following staff is responsible for ensuring compliance with the HASP.

- 1) Site Safety Manager/Director
  - Has the overall responsibility for coordinating and reporting all health and safety activities and the health and safety of Site Workers.
  - Must have completed, at a minimum, the OSHA 30-Hour Construction Safety Training, and either the 24-Hour training course for the Occasional Hazardous Waste Site Worker or the 40-Hour training course for the Hazardous Waste Operations Worker that meets OHSA 29 CFR 1910.
  - Must have completed the 8-Hour site supervisor/manager's course for supervisors and managers having responsibilities for hazardous waste site operations and management.
  - Directs and coordinates health and safety monitoring activities.
  - Ensures that field teams utilize proper personal protective equipment (PPE).
  - Conducts initial onsite specific training prior to Site Workers commencing work.
  - Conducts and documents daily and periodic safety briefings.
  - Ensures that field team members comply with this HASP.
  - Immediately notifies the Construction Manager (CM) Project Manager and Superintendent of all accident/incidents.
  - Determines upgrading or downgrading of PPE based on Site conditions and/or real time monitoring results.

- Ensures that monitoring instruments are calibrated daily or as the manufacturer's instructions determine.
- Reports to the CM Project Manager and Superintendent to provide summaries of field operations and progress.
- Submits and maintains all documentation required in this HASP and any other pertinent health and safety documentation.

## 2) Safety Representatives

- Must be designated to the Site Safety Manager/Director by each Subcontractor as a Competent Person having, at a minimum the OSHA 30-Hour Construction Safety Training
- Must schedule and attend a **Pre-Construction Safety Meeting** with the Site Safety Manager/Director to discuss the Subcontractor Safety Requirements and must attend the **Weekly Subcontractor Coordination Meeting**.
- Responsible for ensuring that their **lower tier contractors** comply with project safety requirements.
- Must make **frequent and regular inspections** of their work areas and activities and ensure hazards that are under their control are corrected immediately and all other hazards are reported to the Construction Manager's Project Manager and Site Safety Manager/Director.
- Must report all work related injuries, regardless of severity, to the Construction Manager's Project Manager and the Site Safety Manager/Director, within 24 hours after they occur, and follow all other safety and reporting requirements outlined in greater detail in Section A-5.

## 3) Site Workers

- Reports any unsafe or potentially hazardous conditions to the Site Safety Manager/Director.
- Maintains knowledge of the information, instructions, and emergency response actions contained in the HASP.
- Complies with rules, regulations, and procedures as set forth in this HASP, including any revisions that are instituted.
- Prevents unauthorized personnel from entering work site.

## **Section B-1: Environmental Conditions**

### **I. Background**

This section of the HASP pertains to excavation of site soils (or other activities that involve moving existing site soils around or off the site) in connection with the construction of the Project or any related excavation or remediation and including, stockpiling, transportation and disposal of soil materials issues related to concentrations of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals and other contaminants, which exceeded the New York State Department of Environmental Conservation (NYSDEC) Guidance Levels. Elevated levels of SVOCs, VOCs, metals and other contaminants were primarily observed in the historic fill materials (Fill) present from land surface to approximately 20 feet below land surface (ft bls) and are typical of historic fill material that was used throughout the development of New York City. Elevated concentrations of SVOCs and heavy metals are generally not observed in the native soils (Soils) present below the Fill (the Fill and Soils are collectively referred to as “soil material” throughout this Section). VOCs were detected above NYSDEC Guidance levels in the Fill and Soils in close proximity to former and/or current gasoline filling stations. In addition, strict adherence to this HASP should protect Site workers from most potential contaminants (including pesticides and PCBs), if present. Although not covered under this section, the excavation contractor (Contractor) shall adhere to all other applicable OSHA and general construction regulations and guidance, as described in this HASP.

The designated Site Safety Manager/Director will be responsible for implementing the requirements of this section of the HASP. Compliance with this HASP is required of all workers who may potentially encounter contaminated materials at the Site (hereinafter referred to as Site Workers), including the Construction Manager’s employees, contractors, subcontractors and all other onsite workers. In the event that a Site Worker does not follow these procedures, he or she will be required to leave the Site immediately. The content of this Section may change or undergo revisions based upon changes in the technical scope of work, the results of monitoring, and/or additional information made available to health and safety personnel. Any proposed changes must be reviewed and approved by the Site Safety Manager/Director before implementing the changes to the HASP.

Upon entering the Site, all visitors will be required to sign in and read and comply with the provisions of this Section. Occasional Site visitors (inspectors, owners, etc.) do not need to comply if they sign a statement acknowledging that they have received Site-specific health and safety training and will comply with the procedures described in the training. In the event that a visitor does not follow these procedures, he or she will be required to leave the Site immediately.

### **II. Overall Phase 2 Environmental Site Assessment Summary**

The Site has been the subject of several previous investigations, the results of which are contained in the following documents:

- A Phase 2 Environmental Site Assessment Report dated May 2006;
- A Phase 2 Environmental Site Assessment Report Addendum dated August 2006.

The field activities performed to accomplish the objectives of the overall Phase 2 ESAs (both the Report and Report Addendum) included the following:

- The collection of samples from over 250 locations;
- Installation of 216 soil borings and collection of over 350 soil samples; and
- Installation of 24 monitoring wells and collection of over 100 groundwater samples from soil borings and monitoring wells.

### **III. Site Geology**

The Site is immediately underlain by a thin, generally continuous layer of historic fill material (consisting of sand, gravel, rock fragments, brick fragments, and other manmade materials). Underlying this fill material in the western portion of the Site are well-graded sands interbedded with lenses of sandy silt, and the eastern portion of the Site typically has lenses of coarser material ranging from coarse-grained gravels to cobbles and boulders. A continuous layer of gravels, cobbles, and boulders is present throughout the eastern two thirds of the Site, ranging in thickness from 10 to 50 feet. The cobbles and boulders are underlain by a brown sand stratigraphic unit that comprises the top of the Upper Glacial Aquifer. The presence of these gravels, cobbles, and boulders presented extensive drilling difficulties at the Site.

### **IV. Soil Quality Results**

In general, exceedances of soil regulatory guidance values are moderately low-levels and are primarily observed:

- within the shallow historic fill materials that are found throughout the Site, which is a common occurrence for historic fill material throughout New York City; and
- in shallow and, in some instances, deeper soils at former and current gasoline filling stations (e.g., Block 1118 Lot 1, Block 1127 Lot 1, Block 1119 Lots 1 and 64, and Block 1129 Lots 46 and 50).

Overall, exceedances of regulatory guidance values from deeper soils (i.e., below the shallow historic fill material layer) were sporadic, with the exception of the former and current gasoline filling stations. Most importantly, with the exception of two soil samples, which contained elevated levels of lead, none of the soils at the Site exceeded the USEPA threshold criteria for consideration as a characteristically hazardous waste (as measured using TCLP),

which is one benchmark for determining whether or not “hazardous waste” levels of contamination are present.

Historic fill material of unknown origin was observed during the drilling and soil sampling activities throughout the majority of the Site. This is a common occurrence throughout New York City.

On average, the upper 20 feet of soil at the Site can be classified as historic fill. The common groups of compounds that exceed the regulatory guidance values in shallow soils include metals, SVOCs, pesticides. These exceedances mostly reflect the nature of the historic fill materials, with the exception of SVOCs found at the former gasoline service station properties.

## **V. Groundwater Flow and Quality Results**

A total of twenty-four monitoring wells and over 100 groundwater grab samples were collected at the Site. Collectively, these data provide a comprehensive characterization of groundwater quality beneath the Site.

In general, groundwater results indicate that two discrete areas (i.e., plumes) of groundwater containing volatile organic compound (VOC) constituents above regulatory guidance values are present at the Site. Across the eastern half of the Site, chlorinated VOCs (primarily tetrachloroethene and trichloroethene) are present in Site groundwater at levels exceeding regulatory guidance values. In this area of the Site, groundwater flows in a northwest direction and the low strength chlorinated solvent plume is elongated in an approximate northwest direction. The orientation of this plume, coupled with groundwater flow, indicate that the plume appears to originate from an offsite, upgradient area to the southeast and the Site does not appear to be the source of this chlorinated solvent plume. Possible sources include leaky sewers or other diffuse sources that contribute to regionally degraded shallow groundwater quality. The downgradient extent of the plume appears to terminate near Atlantic Avenue. The upgradient, offsite extent has not been determined.

In the western portion of the Site, a mixed BTEX (gasoline components including benzene, toluene, ethylbenzene and xylene compounds)/chlorinated VOC plume extends from 6<sup>th</sup> Avenue westward to Flatbush Avenue. In the vicinity of the current/former gasoline filling stations located on Block 1118 Lot 1, Block 1127 Lot 1, and Block 1119 Lots 1 and 64, the groundwater plume is principally comprised of elevated levels of BTEX compounds that appear to stem from gasoline filling station operations. Chlorinated VOCs exceeding regulatory guidance values make up the remainder of this plume. In this area of the Site, groundwater flows in a westward direction toward Flatbush Avenue. The downgradient edge of this plume likely terminates at Flatbush Avenue because the subway tunnel beneath Flatbush Avenue extends below the water table and can potentially act as a drain/barrier that will prevent any further migration of the plume westward across Flatbush Avenue. The extent of the BTEX plume appears to be defined.

In addition to the two discrete VOC plumes at the Site, a few semi-volatile organic compounds (SVOCs) sporadically exceed regulatory guidance values. Various total metals were detected above regulatory guidance values in the unfiltered samples; however, manganese, sodium, and lead (common in regional groundwater) were the only dissolved metals detected above regulatory guidance values in the filtered groundwater samples. Metals are typically detected in unfiltered groundwater samples due to the presence of some turbidity (i.e., from sediment containing metals) in samples at the time of collection. No PCBs or pesticides were detected above regulatory guidance values, with the exception of relatively low levels of dieldrin and heptachlor epoxide.

In general, groundwater at the Site ranges from 4 to 7.5 feet above Site datum (Site datum is the Borough President of Brooklyn Highway (Vertical) Datum, which is 2.560 feet above the U.S.C. & G. Survey Mean Sea Level at Sandy Hook, New Jersey (1929)) and flows in a generally southeast to northwest direction, which is consistent with regional east to west flow patterns. Subway tunnels near the western end of the Site beneath Flatbush Avenue extend below the water table. It is expected that these subway tunnels influence groundwater flow around these structures, similar to the effect of a French drain. As a result, groundwater near the subway tunnels in the western portion of the Site is re-oriented toward the tunnel structures. For example, groundwater beneath Blocks 1118 and 1127 will flow toward the subway tunnel beneath Flatbush Avenue. Likewise, it is expected that groundwater beneath Block 927 immediately on the western side of Flatbush Avenue will also flow toward the subway tunnel (i.e., in an eastward direction).

Groundwater is not addressed further in this HASP. No proposed excavations will be completed into the water table. In addition, there are no plans to complete dewatering anywhere on Site below the water table. Should dewatering or excavation below the water table be required, this Hazardous Materials Health & Safety Plan will be revised by the Site Safety Manager/Director prior to undertaking any such work. All such work will occur in compliance with all applicable environmental and safety regulations.

## **VI. Potential Hazards Related to Fill/Soil**

This section provides a brief summary of the potential Compounds of Concern and related hazards at the Site.

### 1) General

The following information is presented in order to identify the types of materials that may be encountered at the Site. The detailed information on these materials was obtained from:

- Sax's Dangerous Properties of Industrial Materials - Lewis Eighth Edition;
- Chemical Hazards of the Workplace - Proctor/Hughes;
- Condensed Chemical Dictionary – Hawley;
- Rapid Guide to Hazardous Chemicals in the Workplace - Lewis 1990;



- NIOSH Pocket Guide to Chemical Hazards –1996; and
- ACGIH TLV Values and Biological Exposure Indices, OSHA 29 CFR 1910.1000.

## 2) Compounds of Concern

Based on the sampling results, various VOCs (primarily BTEX), SVOCs (primarily PAHs), heavy metals, PCBs, and pesticides were detected above regulatory guidance values in Fill and/or Soil. The Summary of Toxicological Data related to compounds of concern is found in Table 2 and provides information such as the chemicals' characteristics, health hazards, protection, and exposure limits.

## 3) Hazard Assessment

The potential to encounter hazards related to Fill/Soil is dependent upon the type of work activity performed and the duration and location of the work activity. Potential hazards at the Site include inhalation of VOCs and SVOCs or particulates containing contaminants, ingestion of particulates containing contaminants and/or skin contact with contaminants and/or particulates containing contaminants.

Prior to the beginning of each new phase of work, an Activity Hazard Analysis will be prepared by the Site Safety Manager/Director with assistance from the Construction Manager's Project Superintendent. The analysis will address the hazards for each activity performed in the phase and will present the procedures and safeguards necessary to eliminate the hazards or reduce the risk.

The potential for Site Workers to be exposed to chemical hazards may occur during excavation, truck loading, truck and equipment cleaning activities, and/or during other activities in areas where contaminants have been identified. For chronic and acute toxicity data, refer to the Summary of Toxicological Data Sheets in Table 2 for further details on compound characteristics.

## 4) Exposure Pathways and Assessment

Exposure to these compounds during ongoing activities may occur through inhalation of dust particles containing contaminants, inhalation of VOCs and/or SVOCs, and by way of dermal absorption and accidental ingestion by either direct or indirect cross-contamination activities.

Based on known site conditions disclosed in the Phase 2 Environmental Assessment Report dated May 2006 and the Phase 2 Environmental Assessment Report Addendum dated August 2006 and anticipated activities, all site workers will be required to wear OSHA Level D PPE to minimize any potential for exposure. Level D PPE is:

- Work uniform (long pants, sleeved shirt)

- Hard hat
- Steel toe work boots
- Safety glasses
- Boot covers (as necessary depending on the task)
- Hearing protection (as necessary depending on the task)
- Reflective safety vest (as necessary depending on the task)

Additional measures for unexpected conditions are discussed in Section VI. 9 below.

In addition, inhalation of dust particles containing contaminants can occur during adverse weather conditions (high or changing wind directions) or during operations that may generate airborne dust such as excavation, loading of trucks, and grading. To minimize exposure to dust, dust control measures will be implemented in accordance with the EIS and the Site-specific CAMP. Where dust control measures are not feasible or exceed levels contained in Table 1, respiratory protection will be used.

#### 5) Excavation Stockpiles

During the course of work at the Site, it may be necessary to temporarily stockpile excavated soil materials in advance of disposal. Although this is not expected to be a common occurrence, procedures to be followed for the temporary stockpiling of soil materials are described below. All stockpiled material will be covered with polyethylene (poly) sheeting with a minimum thickness of 8 mil. These stockpiles will be covered in order to limit precipitation from contacting soil materials and to avoid the generation of dust from soil materials. Covered stockpiles will be inspected daily to ensure that there has not been any damage to the poly sheeting and that the stockpile is still adequately covered.

#### 6) Dust Control

Dust suppression methods will be employed by the Contractor throughout the construction project. Dust (particulate matter) will be controlled at the Site in accordance with the Site Community Air Monitoring Program (CAMP), and in compliance with all applicable federal, state, and local requirements and the requirements set forth in the FEIS. The Contractor will implement necessary measures to control particulates including the following measures:

- (i) Limiting on-site speed to five miles per hour. Signage of the 5-mile per hour limit will be posted at all site entrances and along routes within the sites.
- (ii) Using sleeves and wetting during demolition activities, and wetting equipment. All demolition activities, including but not limited to building, roadway, and pavement demolition, will utilize dust suppression. All drop transfer operations will be via closed sleeves and into sealed bins. Sleeves will have no openings other than the loading chute. During all breaking up of material such as concrete, an employee will be assigned to wet the surface while the activity is taking place.
- (iii) Watering unpaved surfaces, including haul roads and excavation faces. All unpaved haul roads and excavation surfaces will be continuously watered by watering trucks or

constant misting, so that surfaces remain damp at all times when in use during construction. Gravel cover shall be applied to unpaved surfaces which are regularly traveled.

- (iv) Covering or water-misting of stockpiled materials. All stockpiled dry materials (e.g., sand, aggregate) will be water-misted; sprayed with non-hazardous, biodegradable suppressing agent; covered; or otherwise enclosed.
- (v) Loading of any dry material which may release dust from trucks will be accompanied by manual water spraying of the material.
- (vi) Covering all trucks carrying loose material such as debris, excavate or fill, and verifying that covers on all such trucks have been properly sealed. Outgoing trucks will be inspected at the gate, and not allowed to exit if covers are not properly sealed.
- (vii) Washing the wheels of all trucks as they exit from the site. A washing station will be constructed at each truck exit, whereby truck wheels will be washed, and the water shall be contained and recycled to avoid tracking mud out of the site.

The Contractor will make provisions to have an adequate amount of water and appropriate equipment to disperse water onsite at all times.

#### 7) Transportation and Disposal of Soils

Prior to the start of excavation, if possible, all soil materials will be sampled at a frequency sufficient to meet disposal facility requirements and the Contractor will secure approvals for disposal of soil materials in accordance with federal, state, and local regulations. The soil material will be loaded directly into trucks after excavation and transported to an offsite disposal facility (unless Site conditions, coordination of activities, timelines, and/or daily production limitations require temporary stockpiling prior to sampling and disposal). The contaminated soil material will be shipped by a licensed hauler in accordance with all applicable federal, state, and local regulations. Each shipment will be transported under a non-hazardous waste manifest/bill of lading, hazardous waste manifest or other appropriate documentation based upon sampling results. All contaminated soil material will be properly disposed of at a permitted offsite Treatment, Storage and Disposal Facility (TSDF). Before any transport vehicle leaves the site, the sides and wheels will be inspected. If any soil materials are observed on the wheels or body of the truck, they will be removed using a shovel, broom, water hose and/or other hand tools in the designated vehicle cleaning area (Section 6.3). In addition, all trucks carrying soil material for disposal will have the soils in the truck body covered with a tarp. Outgoing trucks shall be inspected at the gate and not allowed to exit if covers are not properly utilized.

## 8) Additional Precautions

Dermal absorption or skin contact with contaminants is possible during intrusive activities and grading at the Site. The use of proper PPE, as described in Section VI (4), and proper vehicle and Site Worker cleaning procedures should significantly reduce the risk of skin contact. In addition, adhering to the dust control procedures will reduce the amount of airborne dust and therefore reduce the risk of skin contact and inhalation. The potential for accidental ingestion of contaminated particulates is expected to be remote when good hygiene practices are used.

## 9) Hazard Assessment and Mitigation

Hazardous conditions requiring higher levels of PPEs and personal cleaning facilities are not anticipated to occur on site given the nature of anticipated construction activities. If hazardous conditions are encountered, activities, if any, which involve direct physical contact with free phase petroleum, hazardous waste as defined by EPA or grossly contaminated soil as defined by DEC guidance (i.e. soil that contains visibly identifiable free or otherwise readily detectable free or residual product) would be addressed as set forth below. A decision to upgrade the required level of PPE and/or withdrawal of Site Workers from an area would be made by the Site Safety Manager/Director based on atmospheric hazards, as determined by air monitoring and/or the presence of unexpected site conditions. In addition, if, during site work, unanticipated construction activities require direct physical contact with free phase petroleum product or soils containing materials exceeding EPA thresholds for hazardous materials, those workers engaged in such activities will be required to increase their level of PPE to Modified Level D or higher, based on the potential for exposure and OSHA requirements. Modified Level D PPE includes:

- Outer gloves: leather, cotton, neoprene or nitrile (as specified by the Site Safety Manager/ Director)
- Inner gloves: latex or nitrile
- Regular Tyvek coveralls (Poly-coated Tyvek, as specified by the Site Safety Manager/ Director)
- Chemical resistant boots over work boots (as specified by the Site Safety Manager/ Director)
- Steel toe work boots
- Hard Hat
- Safety glasses
- Hearing protection (as necessary depending on the task)
- Reflective safety vest (as necessary depending on the task)

## **VII. Site Control for Unexpected Conditions**

In the event that unexpected conditions or hazardous waste is encountered (only two known areas of hazardous waste exist based on the Phase 2 ESA results), thereby requiring workers trained in accordance with 29 CFR 1910.120 (which requires either the 24-Hour training course for the Occasional Hazardous Waste Site Worker or the 40-Hour training course for the Hazardous Waste Operations Worker), the following four-zone approach will be employed in order to prevent the spread of the contamination from the area containing the unexpected condition and to protect Site Workers. The four-zones include the Exclusion Zone, the Contamination Reduction Zone, the Remediated Zone, and the Support Zone. A stepped remedial approach will be managed and the zones modified as the work progresses. Each of the areas will be defined through the use of control barricades and/or construction/hazard fencing. A clearly marked delineation between the zones will be maintained. Signage will be posted to further identify and delineate these areas. Unexpected conditions that may be encountered include previously unknown buried drums, Underground Storage Tanks, (USTs), Aboveground Storage Tanks, (ASTs), and grossly contaminated soil. Grossly contaminated soil is defined in the NYSDEC's Draft DER-10 Technical Guidance for Site Investigation and Remediation document as soil that contains visibly identifiable free or otherwise readily detectable free or residual product.

In order to minimize the potential for exposure in areas of grossly contaminated soil or hazardous materials, Site workers shall:

- Avoid eating or drinking in these areas;
- Take extra precautions to protect any skin injuries; and
- Not use cigarettes, cosmetics, gum, etc., in these areas.

The following subsections describe the four zones that will be utilized in the event that unexpected conditions or gross contamination is discovered at the Site.

#### 1) Exclusion Zone

The area where the unexpected condition is discovered would be considered the Exclusion Zone (EZ). All excavation and handling of contaminated materials generated as a result of the discovery of an unexpected condition would take place within the EZ. This zone will be clearly delineated by hay bales, jersey barriers, and/or similar methods. Safety tape may be used as secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The Site Safety Manager/Director may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Site Workers will not be allowed in the EZ without:

- A buddy (co-worker)
- Appropriate PPE in accordance with OSHA regulations
- Medical authorization

- Training certification in accordance with 29 CFR 1910.120

## 2) Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) will be established between the EZ and the property limits. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of Site Workers and equipment. The CRZ will be used for general Site entry and egress, in addition to access for heavy equipment and emergency support services. Site Workers will not be allowed in the CRZ without:

- A buddy (co-worker)
- Appropriate PPE in accordance with OSHA regulations
- Medical authorization
- Training certification in accordance with 29 CFR 1910.120

In addition, the CRZ will include a Site Worker Cleaning Area that will include a field wash station for Site Workers, equipment, and PPE to allow Site Workers to wash their hands, arms, neck, and face after exiting areas of grossly contaminated soil or hazardous materials. All Site Workers will be required to pass through the Site Worker Cleaning Area and wash their hands and remove any loose fill and soils from their clothing and boots prior to exiting the CRZ.

## 3) Remediated Zone

A Remediated Zone (RZ) will be established in portions of the Site where the remediation has been completed and only general construction work will be performed. Setup of the RZ will consist of implementing several measures designed to reduce the risk of workers' exposure and prevent non-trained workers from entering the non-remediated zone. Non-trained workers will work only in areas where the potential for exposure has been minimized by removal of all hazardous materials. The remediated zone will then be separated from the non-remediated zone by installing and maintaining temporary plywood or other construction fences along the boundary between the two zones. If potentially impacted material is uncovered in the RZ, all non-trained workers will be removed and the Site Safety Manager/Director will assess the potential risks. If, at any other time, the risk of exposure increases while non-trained workers are present in the RZ, the non-trained workers will be removed. At all times, when non-trained workers are present in the RZ, air monitoring for the presence of VOCs will be conducted in the RZ, as well as at the fence line of the non-remediated zone.

## 4) Support Zone

The Support Zone (SZ) will be an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated Site Workers or

materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold.

## **VIII. Monitoring Procedures**

In addition to the monitoring requirements set forth in the CAMP, as part of customary practice, periodic ambient air monitoring will be performed during the excavation of site soils (or other activities that involve moving existing site soils around or off the site) in connection with the construction of the Project or any related excavation or remediation in areas where the results of the Phase 2 ESA indicate the potential for conditions of concern. If air monitoring results exceed the levels indicated in Table 1, the appropriate OSHA requirements will be followed. All monitoring instruments shall be operated by qualified personnel only and will be calibrated prior to use, as necessary. No excavation will be performed without the presence of the Site Safety Manager/Director or designated approved substitute at the Site, and without air monitoring as outlined in the CAMP. The Site Safety Manager/Director is responsible for ensuring that appropriate monitoring, levels of protection and safety procedures are followed.

### 1) Instrumentation

The following monitoring instruments will be supplied and utilized by the Contractor, and will be available for use during field operations, as necessary. There will be a minimum of one of each piece of equipment on the Site at all times (depending on the size and locations of active work areas, it may be prudent to have multiple machines on Site):

- Photoionization Detector (PID) with 10.6 EV probe, Flame Ionization Detector (FID), or equivalent.
- Dust/Particulate Monitor (DM), MIE Miniram, or equivalent.

A PID and/or FID equipped organic vapor meter shall be used as outlined above to monitor VOCs in and around active work areas during excavation and truck loading activities, and to measure VOCs upwind of the work areas to determine background concentrations.

A particulate monitor shall be used as outlined above to measure concentrations of dust and particulate matter in and around the active work areas, and to measure particulates upwind of the work areas to determine background concentrations.

All instruments shall be calibrated daily prior to use in accordance with the manufacturer's procedures. Calibration records shall be documented and recorded daily.

The frequency of monitoring should be determined by the Site Safety Manager/Director after consultation with the Construction Manager's Project Superintendent. The rationale for any modification must be documented and maintained by the Site Safety Manager/Director in the onsite health and safety files.

## 2) Action Levels

Action levels for the upgrading of PPE requirements in the HASP will apply to all Site work during excavation and truck loading activities at the Site. These action levels are provided in Table 1 and are for known contaminants measured using direct reading instruments in the Breathing Zone (BZ) for VOCs and particulates. The BZ will be determined by the Site Safety Manager/Director, but is typically 4 to 5 feet above the work area surface or elevation.

An air horn will be readily available in the Site trailer. An additional air horn will be located in the work area to alert Site Workers to an emergency situation. In the event of an emergency or the need to upgrade the level of personal protection, sharp blasts of the air horn will be sounded. If the level of respiratory protection needs to be upgraded, the Contractor will immediately contact the Construction Manager and Owner's Representative.

## 3) Community Air Monitoring Program

The Owners representative will perform a Community Air Monitoring Program (CAMP) at the Site during all subsurface disturbance (i.e., during all grading, excavation, transporting, and loading of soil for disposal). The CAMP will meet the requirements of the New York State Department of Health Generic CAMP. The CAMP details are provided in the CAMP Plan, which is a separate document that will be distributed to Subcontractors in the Project Manual.

## **IX. Vehicle Cleaning Areas and Disposal Procedures**

This section details the specific vehicle cleaning and waste disposal procedures to be implemented at the Site during the excavation and truck loading activities.

### 1) Contamination Prevention

Contamination prevention will help to avoid spreading Site-derived Fill and Soil onto the public roadways and into areas of the Site where contaminated materials have been removed. Procedures for prevention include:

#### Heavy Equipment

- Care should be taken to limit the amount of contaminated material that comes in contact with heavy equipment (tires).
- If tools used in contaminated areas are to be placed on equipment for transport to an area where all contaminated material has been removed or to be cleaned, plastic should be used to keep the equipment clean.
- Heavy equipment that comes in contact with contaminated material should be decontaminated to remove any remaining contamination prior to the equipment being removed from the Site.



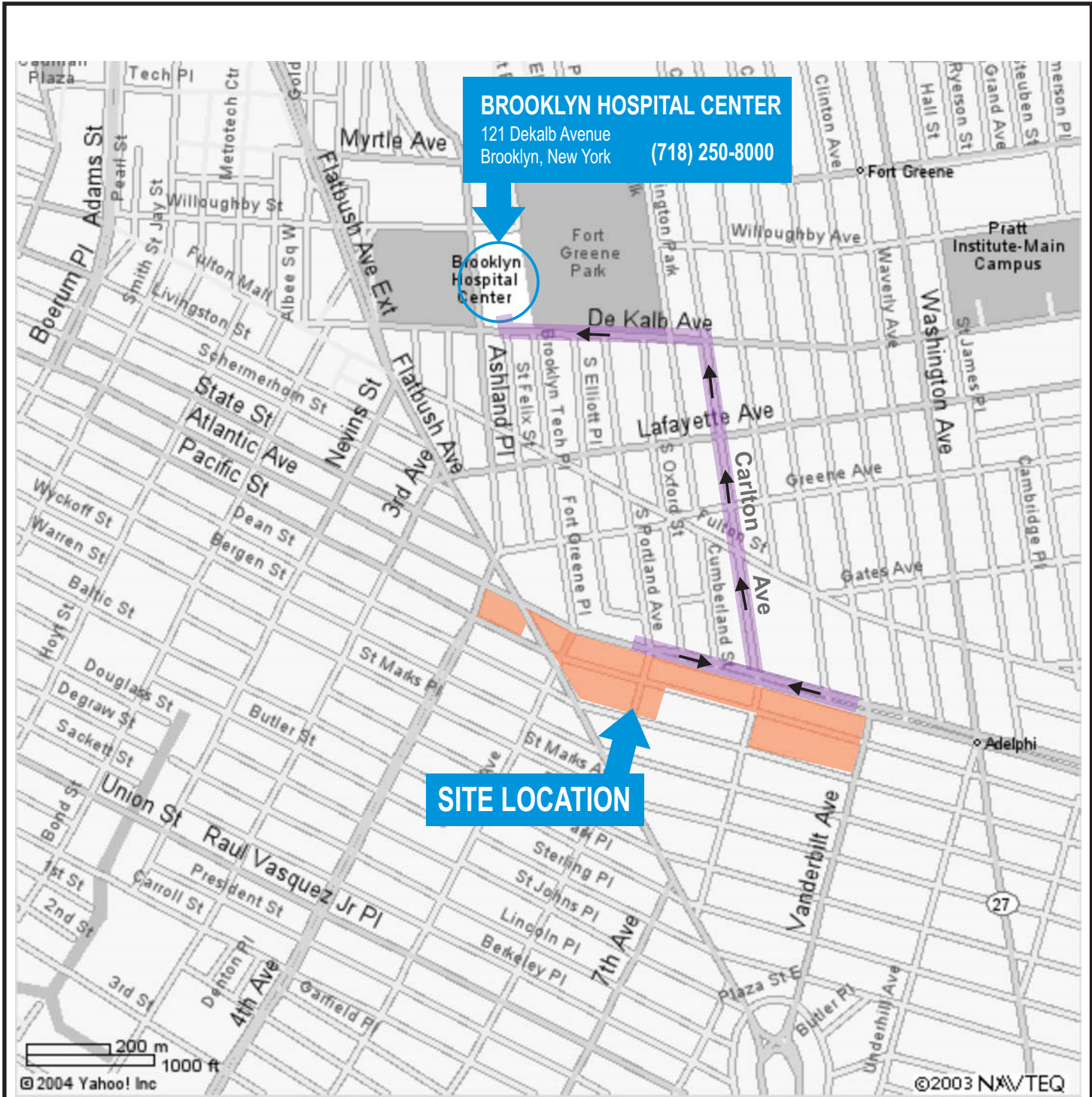
- Dust control measures, including water misting, will be used on roads inside the Site boundaries, as described in the CAMP.

#### 1) Vehicle Cleaning Area/Stabilized Construction Entrances

One or more temporary vehicle cleaning areas will be constructed to clean disposal trucks and other vehicles and heavy equipment prior to leaving the Site. The vehicle cleaning area will be constructed of gravel and will be of sufficient size to prevent vehicles from spreading contaminated material. Before any disposal truck or other vehicle, or heavy equipment leaves the Site, the sides and wheels will be inspected. If any soil material is observed on the wheels or body of the truck or heavy equipment, the soil material will be removed and collected for disposal using a shovel, broom, and/or other methods including wet vehicle cleaning procedures (i.e., power washing or steam cleaning). Water will be contained and recycled to avoid tracking mud out of the Site. No equipment will be allowed to leave the Site prior to inspection and verification that the equipment was properly cleaned. The Site Safety Director/Manager will inspect the streets surrounding the Site to determine whether they are becoming covered with soil from the Site; if this occurs, the Contractor will clean the streets.

#### 2) Disposal Procedures

While it is not anticipated that there will be equipment, special clothing or other materials that would be required to be segregated, if unexpected conditions arise, waste would be segregated and disposed of based on its level of contamination and the requirements of the disposal facilities. All discarded materials, waste materials, or other objects will be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left onsite. If any potentially contaminated materials (e.g., clothing, gloves, etc.) are generated, they will be bagged or drummed, as necessary, labeled, and segregated for disposal. (All non-contaminated materials will be collected and bagged for appropriate disposal.)



**BROOKLYN HOSPITAL CENTER**

121 DeKalb Avenue  
Brooklyn, New York (718) 250-8000

**SITE LOCATION**

**DIRECTIONS TO HOSPITAL**

- 1) Head toward ATLANTIC AVE.
- 2) Turn NORTH onto CARLTON AVE.
- 3) Turn LEFT onto DEKALB AVE.
- 4) Hospital will be on right after 6 blocks.



Title:

**HOSPITAL ROUTE MAP**  
BROOKLYN HOSPITAL CENTER

ATLANTIC YARDS ARENA AND REDEVELOPMENT PROJECT

Prepared for: ATLANTIC YARDS DEVELOPMENT CO., LLC  
BROOKLYN ARENA, LLC

Compiled by: F.C.	Date: 02JAN07	FIGURE <b>1</b>
Prepared by: J.A.D.	Scale: SHOWN	
Project Mgr.: S.S.	Office: NY	
File No.: FCR1421501.CDR	Project No.: 92414Y03	

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**TABLE 1**

**ACTION LEVELS FOR WORKER BREATHING ZONE**

<b><u>Instrument</u></b>	<b><u>Action Level *</u></b>	<b><u>Level of Respiratory Protection/Action</u></b>
PID	0 to <5 ppm (one minute sustained)	Level D *
PID	>5 to <50 ppm (one minute sustained)	Level C (Utilize Air Purifying Respirator)
PID	>50 to <100 ppm (one minute sustained)	Level B
PID	>100ppm	Stop work** (ventilate, apply foam)
Dust Monitor	0 – 1.0 mg/m <sup>3</sup> , 5-minute average	Level D
Dust Monitor	>1.0 to 5.0 mg/m <sup>3</sup> , 5-minute average	Level D – Institute dust suppression measures
Dust Monitor	>5.0 to 50 mg/m <sup>3</sup> , 5-minute average	Level C – Institute dust suppression measures

Note: Action levels are based on above background levels.

\* Instrument readings will be taken in the breathing zone (BZ) of the Site Workers, unless otherwise indicated.

\*\* Suspend work in immediate area. Conduct air monitoring periodically to determine when work can continue. Implement mitigative measures.

**Table 2. Toxicological Physical and Chemical Properties of Compounds Potentially Present at the Site**

Compound of Concern	Exposure Limits	Characteristics	Routes of Exposure	Symptoms of Overexposure
Chromium	OSHA PEL, TWA 0.5 mg/m <sup>3</sup>	Appearance and odor vary, depending on the specific chromium compound.	inhalation, ingestion, contact	irritation of the eyes, sensitization dermatitis
Lead	NIOSH 0.10 mg/m <sup>3</sup> OSHA 0.050 mg/m <sup>3</sup> OSHA Action Limit of 0.030 mg/m <sup>3</sup>	Heavy, ductile, soft, gray solid.	inhalation, absorption, ingestion	weak, insomnia, constipation, abdominal pain, tremor, hypertension
Mercury (vapor)	OSHA PEL 19 mg/m <sup>3</sup> (5 ppm)	Colorless to light pink, sweet acrid odor.	Inhalation; ingestion; absorption; skin/eye contact	irritation of eyes and skin, muscle aches and pains, dark urine
PAHs	ACGIH 0.2 mg/m <sup>3</sup>	Appearance and odor vary, depending upon specific compound.	inhalation, absorption, ingestion	dermatitis, bronchitis, carcinogen
PCBs	OSHA PEL, TWA 0.5 mg/m <sup>3</sup>	Colorless to pale yellow, mild hydrocarbon odor.	inhalation, ingestion, skin adsorption	irritation of eyes and skin, nausea, abdominal pain, liver damage
Benzene	0.5 ppm (8 hr.TWA), 1ppm PEL	vapor, aromatic odor	inhalation, ingestion, skin adsorption	Dermatitis, CNS Depression
Diesel Fuel	NA	Light amber liquid	Inhalation; ingestion; absorption; skin/eye contact	Dizziness, naseau
Ethylbenzene	PEL 435 mg/m <sup>3</sup> (100 ppm)	Liquid, aromatic odor	inhalation, ingestion, skin adsorption	Sensory irritant, CNS depression
Fuel Oil		Dark liquid	Inhalation; ingestion; absorption; skin/eye contact	Skin irritant
Gasoline	PEL 900mg/m <sup>3</sup> (300 ppm)	Liquid, aromatic odor	inhalation, ingestion, skin adsorption	Eye/skin irritation, CNS depression
Kerosene	PEL 100 mg/m <sup>3</sup> (100 ppm)	yellow to white oily liquid	Inhalation; ingestion; absorption; skin/eye contact	Eye/skin irritation, dizziness, naseau
Petroleum hydrocarbons (Petroleum distillates)	PEL 2000 mg/m <sup>3</sup>	colorless liquid	inhalation, ingestion, skin adsorption	respiratory irritant, skin irritant, CNS depression
Petroleum naphtha	PEL 400 mg/m <sup>3</sup> (100 ppm)	reddish brown liquid, aromatic odor	inhalation, ingestion, skin adsorption	Eye/skin irritation, CNS depression
Toluene	PEL 188 mg/m <sup>3</sup> (50 ppm) skin, 200 ppm inhalation	Colorless liquid, sweet odor	inhalation, ingestion, skin adsorption	Eye/skin irritation, CNS depression
Xylene	PEL 435 mg/m <sup>3</sup> (100 ppm)	Liquid, aromatic odor	inhalation, ingestion, skin adsorption	Eye/skin irritation, CNS depression

**References**

U.S. Department of Labor. 1990. OSHA Regulated Hazardous Substances, industrial Exposure and Control Technologies Government Institutes, Inc.  
 Hawley's Condensed Chemical Dictionary, Sax, N. Van Nostrand and Reinhold Company, 11th Edition, 1987.  
 NIOSH Pocket Guide to Chemicals, 1999, National Institute for Occupational Safety and Health.  
 TWA - Time Weighted Average for 8-hour workday unless otherwise noted.  
 Proctor, N.H., J.P. Hughes and M.L. Fischman, 1989. Chemical Hazards of the Workplace. Van Nostrand Reinhold. New York.  
 Sax, N.I. and R.J. Lewis. 1989. Dangerous Properties of Industrial Materials. 7th Edition. Van Nostrand Reinhold. New York.  
 Guide to Occupational Exposure Values. 1990. American Conference of Governmental Industrial Hygienists (ACGIH).  
 TLV ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).

**IDLH** Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

**PEL** OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.