

Community Air Monitoring Program Work Plan

Rockaway Park Former MGP Site

Rockaway Park, New York

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Submitted to:

KeySpan Corporation
One Metro Tech Center
Brooklyn, NY 11201-3850

Submitted by:

GEI Consultants, Inc.
110 Walt Whitman Road, Suite 201
Huntington Station, NY 11746
631-760-9300

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Executive Summary

This Community Air Monitoring Program (CAMP) Work Plan has been developed to provide specific procedures for measuring, documenting, and responding to potential airborne contaminants during the remedial action at the Former Rockaway Park Manufactured Gas Plant site. The procedures in this CAMP are focused on the monitoring of airborne contaminants at the site perimeter and complement the work zone monitoring conducted to protect site workers as described in the site Health and Safety Plan (HASP). This CAMP Work Plan is based on and builds on the CAMP guidelines established by the New York State Department of Health (NYSDOH) in the New York State Department of Environmental Conservation (NYSDEC) DER-10 Draft Technical Guidance for Site Investigation and Remediation (DER-10) (December 2002). Site activities related to the proposed project will begin May 2008. The CAMP is designed to provide monitoring procedures, Alert Limits, Action Limits, and contingency measures if Action Limits are approached. An alert limit is a contaminant concentration or odor intensity that triggers contingent measures. An Alert Limit does not suggest the existence of a health hazard, but serves instead as a screening tool to trigger contingent measures if necessary, to assist in minimizing offsite transport of contaminants and odors during remedial activities. An Action Limit is a contaminant concentration or odor intensity that triggers work stoppage.

During times of ground intrusive activities, fenceline perimeter air monitoring will be conducted using a combination of real-time (continuous and almost instantaneous) air monitoring at fixed locations (24 hours a day/7 days a week) and walk-around supplemental monitoring using hand-held instruments on an as-needed basis. Contaminants commonly found at former MGP sites will be monitored, including volatile organic compounds (VOCs) and dust. Relative odor intensity will also be monitored using an American Society for Testing Materials (ASTM) method. The Contingency Plan defines Alert Levels, Action Levels, and specific response activities to be implemented during working hours if an exceedance of an Alert Limit or Action Limit for a measured compound occurs. The response actions, potentially including work stoppage, are intended to prevent or significantly reduce the migration of airborne contaminants from the site. Although hydrogen cyanide has not been detected in the soil or groundwater, there will be a separate contingency plan for monitoring for its presence if cyanide-containing material is encountered during excavation. A representative from the NYSDEC will be present during the critical phases of the remedial work to review monitoring data as it is recorded.

The following plan describes the monitoring to be conducted during significant ground intrusive activities. Significant ground intrusive activities are those excavations on the main Rockaway Park site where there is reasonable expectation of encountering MGP-impacted materials. Where appropriate, an alternative level of monitoring which is in compliance with NYSDOH CAMP Guidance in DER-10 and equally protective of the community may be employed. Based on specific field activities, a decision will be made as to the appropriate level of monitoring. Specific activities could include pre-trenching and surface clearing activities for the installation of the subsurface barrier in the Bulkhead Area or additional geotechnical or environmental borings deemed necessary during the performance of the remedy. For these activities, monitoring may be performed using equipment and procedures similar to those used at the site during previous investigation activities as described in Section 4 of this document.

1. Introduction

The NYSDOH Generic Community Air Monitoring Program (CAMP), as presented in New York State Department of Environmental Conservation's (NYSDEC) document DER-10 Technical Guidance for Site Investigation and Remediation, requires that real-time monitoring for total volatile organic compound (TVOC) and particulates (i.e., dust) be conducted at the downwind perimeter of each designated work area during ground intrusive activities at contaminated sites. As such, this work plan describes the proposed air monitoring means and methods that will be implemented during the construction activities at the Rockaway Park Former Manufactured Gas Plant (MGP) site (Site). A site location map is shown on Figure 1. Proposed construction activities that require ground intrusive activities at the site include the following:

- Installation of subsurface non-aqueous phase liquid (NAPL) migration barriers to depths ranging from 50 to 120 feet below ground surface;
- Excavation of contaminated soil to 8 feet below ground surface; and
- Installation of a soil cap.

Air monitoring at the Site will be conducted in accordance with the NYSDOH CAMP. The purpose of the air-monitoring program is to provide early detection in the field of potential short-term emissions. The early detection of potential emissions and associated contingency measures is intended to expedite any necessary mitigation measures, and to reduce the potential for the community and public to be exposed to hazardous constituents at levels above accepted regulatory limits and guidelines provided in the NYSDOH Generic CAMP. During ground intrusive activities at the Site, the CAMP will be conducted using a combination of real-time air monitoring at fixed locations and supplemental walk-around perimeter monitoring using hand-held instruments as appropriate.

The objectives of the CAMP are as follows:

- Provide an early warning system to alert KeySpan that concentrations of TVOCs or dust in ambient air are approaching Action Levels due to site activities.
- Provide details for a site contingency plan that is designed to reduce the off-site migration of contaminants/odors if established Action Limits are approached or exceeded.

- Determine whether construction controls are effective in reducing ambient air concentrations to below Action Limits and make appropriate and necessary adjustments.
- Develop a permanent record that includes a database of perimeter air monitoring results and meteorological conditions, equipment maintenance, calibration records, and other pertinent information.

1.1 General Approach

The general approach to meet the objectives of the Plan is two-fold:

1. *Utilize a real-time system to monitor target compounds.* Real-time monitoring data will be used as an early warning system so that the air monitoring contractor can alert KeySpan and the construction manager that concentrations of target compounds are approaching Action Limits Under this scenario, KeySpan, the construction manager, and the air monitoring contractor can then begin to evaluate and implement appropriate site controls to maintain acceptable ambient air concentrations.
2. *Develop comprehensive data management and analysis procedures.* Data will be generated from a variety of sources, including real-time fixed station analytical monitoring, pre-construction baseline sampling, supplemental hand held equipment, and meteorological monitoring. These data will be reduced, evaluated, verified, and presented to KeySpan and the construction manager in a timely manner to facilitate timely decision-making.

2. Sampling and Analytical Procedures

This section of the CAMP presents a detailed description of the air monitoring sampling and analytical procedures, including data management that will be used during the Site ground intrusive activities.

In general, real-time sampling methods will be utilized to determine ambient air concentrations during the project. Real-time continuous monitoring for TVOC and respirable particulate matter (RPM₁₀) will occur at six fixed locations. Meteorological conditions including wind speed and direction, temperature, and relative humidity will be monitored in real time. Supplemental walk-around perimeter monitoring for TVOC, RPM₁₀, and odor intensity will occur along the perimeter of the project site on an as-needed basis.

2.1 Alert Limit and Action Limit

An Alert Limit is a contaminant concentration or odor intensity that when exceeded triggers contingent measures. For example, if odors are detected on site, contingent measures such as the use of odor suppression foam may be required. An Action Limit is a contaminant concentration that when exceeded requires a work stoppage.

The following target compounds and corresponding Alert Limits and Action Limits were developed in accordance with the NYSDOH Generic CAMP.

Target Compounds	Alert Limit
TVOCs (15-minute average concentration)	3.7 ppm greater than background*
Respirable Particulate Matter (RPM ₁₀)	100 µg/m ³ greater than background*

Target Compounds	Action Limit
TVOCs (15-minute average concentration)	5.0 ppm greater than background*
TVOCs (1-minute concentration)	25 ppm greater than background*
Respirable Particulate Matter (RPM ₁₀)	150 µg/m ³ greater than background*
Odor (n-butanol scale) (15-minute sustained)	3 (Verified related to construction)
Odor (nuisance)	Public complaints that are verified to be related to construction
Hydrogen cyanide	1 ppmv

ppmv - parts per million volume

µg/m³ - micrograms per meter cubed

* Background is defined as the current upwind fifteen-minute average concentration.

2.2 Real-Time Fixed Station Monitoring

Real-time air monitoring for TVOCs and suspended particulates will be conducted upwind and downwind of the work area along the site perimeter. The intent of the real-time monitoring program is to provide early detection in the field of short-term emissions and off-site migration of site-related TVOCs and dust. Real-time monitors will operate 24 hours per day during periods of excavation activity. The perimeter air monitoring system consists of six Air Monitoring Stations (AMS), one meteorological tower, and one central computer system. The central computer system will be located in the project trailer located on the site.

Real-time monitoring will be conducted at six fixed air-monitoring stations (AMS-1 through AMS-6, Figure 2). The rationale for the placement of each fixed station is summarized below.

Based on surface meteorological data from JFK airport from the past five years, the predominant wind directions in the area are from the west and the south. Residences are located to the south of the Site (across Rockaway Freeway) and commercial facilities are located west of the Site. Therefore, the potential sensitive receptors in the area are expected to be upwind of the remedial activities. Jamaica Bay is located to the north of the site and a wastewater treatment plant is located to the east. The real-time fixed air monitoring stations will be positioned between the work zone and the largest number of potential off-site receptors. Therefore, the placement of the fixed air monitoring stations is based on the need to document all potential offsite migration on the perimeter, but also recognizes the potential off-site receptors and the location of the proposed construction activities. The following are the approximate location of the fixed air monitoring stations:

- **AMS-1** and **AMS-2** will be located along the northern boundary of the Site adjacent to Beach Channel Drive.
- **AMS-3** will be located along the eastern boundary adjacent to Beach 108th Street.
- **AMS-4** and **AMS-5** will be located along the southern boundary adjacent to the Rockaway Freeway.
- **AMS-6** will be located on the western boundary of the site adjacent to the Rockaway Freeway.

Each real-time air monitoring station contains the following:

1. Station enclosure
2. An organic vapor analyzer or PhotoVac Voyager gas chromatograph (GC)
3. A particulate monitor
4. A data communications device

Each monitoring station is housed in a weather-tight NEMA-4 type enclosure. The internal components of an air monitoring station are illustrated in Figure 3.

Each monitoring station will continuously measure and record TVOCs and RPM_{10} .

Each GC, if used, will operate in the TVOC mode to determine the TVOC concentration in ambient air. In TVOC mode, the GCs will collect and analyze samples at a rate of one sample per minute. If the TVOC concentration measured at a station reaches an Alert Limit (3.7 parts per million [ppm] or 75 percent of the Action Limit for TVOC), then the GC at that station will begin to continuously sample and measure in the compound-specific mode. In the compound-specific mode, quantitative concentrations of benzene, toluene, m,p-xylene/ethylbenzene, and o-xylene in ambient air will be determined.

Each portable particulate meter will be equipped with a PM-10 impactor to monitor RPM less than 10 microns (RPM_{10}). Particulate meters analyze samples once every minute.

In addition to the six monitoring stations, a Campbell Scientific, Inc. Met Data1 meteorological monitoring system, or equivalent, will be established on site. The meteorological system will be set at a height of 3 meters (approximately 10 feet) aboveground and located along the northern boundary of the site in an area that is clear of buildings, trees, or other obstructions (Figure 1). The meteorological system will continuously monitor temperature, relative humidity, wind speed, and wind direction. Fifteen-minute average values for each meteorological parameter will be stored in the meteorological system until downloaded once per week. However, real-time wind direction and speed is displayed on the central computer.

All TVOC, individual VOC constituents, RPM_{10} , and meteorological data will be stored in dataloggers located within each monitoring station. Stored analytical data along with system performance data from each station will be sent in real-time, via radio telemetry, to the central computer system located in the project office or trailer for monitoring and analysis.

Equipment calibration will be performed according to manufacturer's instructions. Each GC will be calibrated once daily using a certified standard isobutylene gas for TVOC mode and a certified standard gas mixture for specific compounds. If a GC is not used, each organic vapor analyzer will be calibrated once daily using a certified standard isobutylene gas. Particulate monitors for RPM_{10} will be zeroed daily. Hand-held portable equipment will be calibrated before each use, and a minimum of once per week when not in use.

In the event of an exceedance of an Alert Limit or Action Limit for TVOC or RPM_{10} , the air-monitoring consultant will be notified via phone paging. The central computer will be equipped with a modem or wireless card that is capable of sending text pages to cell phones. If a TVOC Alert Limit or Action Limit is reached during non-working hours, the system will be checked remotely and an appropriate response action will be determined.

2.3 Supplemental and Perimeter Walk-around Monitoring

Supplemental walk-around perimeter monitoring for TVOC, RPM_{10} , and odor will occur along the perimeter of the project site on an as-needed basis. Specific site conditions that may trigger walk-around perimeter monitoring include:

- Visible dust
- Odor complaints
- Detection of TVOCs and/or RPM_{10} at an AMS at concentrations exceeding an Alert Limit or Action Limit
- Direction by KeySpan or the construction manager

Fifteen-minute average TVOC, RPM_{10} , and odor intensity readings will be collected continuously at a downwind location between the work area and the nearest receptors.

When a triggering condition is observed during ground intrusive activity, the supplemental down wind perimeter monitoring will occur continuously until the conditions that triggered the monitoring have subsided. TVOC concentrations will be monitored and recorded using a Portable Ionization Detector (PID) or equivalent. RPM_{10} will be measured and recorded using a portable real-time aerosol monitor equipped with a PM-10 impactor. Odors will be noted based on the n-butanol scale, as adapted from ASTM E544-99. At each monitoring point, the 15-minute average value of TVOC and RPM_{10} , sample time, and sample location will be collected and recorded. Additional temporary monitoring points may be established due to changing site or meteorological conditions.

If cyanide materials are encountered during excavation or work area monitoring detects a confirmed measurement of cyanide, cyanide will be monitored at the perimeter downwind. To monitor cyanide (as hydrogen cyanide gas), a real-time hand-held meter in conjunction with the Dräger Chip Measuring System (CMS) will be used. Types of continuously monitoring equipment include the V-RAE by Rae Systems and the Mini-Warn by Dräger Safety Systems and are available from rental equipment suppliers.

Due to potential interference from sulfur compounds, hydrogen sulfide gas (H₂S) will also be monitored for comparison to the hydrogen cyanide gas levels detected. Hydrogen cyanide gas detections will also be confirmed with CMS Dräger tubes due to this interference. The Dräger CMS can quantify other gases that could potentially provide false positives for hydrogen cyanide gas (including sulfur dioxide, hydrogen sulfide, phosphine gas, hydrogen chloride, and nitrogen dioxide) detected by the real-time meter.

2.4 Time-Weighted Average Volatile Organic Compound Measurements

Verification VOC samples will be collected once per week at two air-monitoring stations. The verification samples are collected to demonstrate that the real-time monitoring stations are effective in measuring the concentration of the VOC target compounds. VOC samples will be collected using 6-liter Summa[®] canisters (or equivalent vacuum canisters) and analyzed using United States Environmental Protection Agency (EPA) Method TO-15 modified to include naphthalene. An accredited laboratory will perform the analytical testing on the canisters and will provide Category B deliverables as required by the New York Analytical Services Protocol. The data will be validated according to EPA and New York State Requirements.

2.5 Pre-Construction Baseline Sampling

Pre-construction sampling will be completed to establish baseline ambient air concentrations prior to the start of construction activities. Baseline conditions will be developed for TVOCs and RPM₁₀ in ambient air using real-time fixed station sampling methods. In addition, a baseline odor survey will be completed during background sampling activities. Sample collection and analysis methods will follow those described in subsection 2.2 (Real-Time Fixed Station Monitoring).

Pre-construction real-time sampling will take place at the six fixed air monitoring station locations to determine TVOC and RPM₁₀ baseline conditions. TVOC data will be recorded 24 hours per day for a minimum of three days.

Pre-construction odors will also be established prior to construction activities. On-site and off-site odor surveys will be conducted using the 8-point n-butanol scale. The on-site odor surveys will be conducted along the perimeter of the site. The off-site odor surveys will be conducted throughout adjacent neighborhoods and adjacent to the wastewater treatment plant east of the site.

2.6 Data Management Procedures

This section of the Plan discusses the data management procedures that will be used during the remedy. Data will be generated from a variety of sources, including real-time fixed station analytical monitoring, supplemental walk-around monitoring, pre-construction sampling, verification TO-15 sampling, and meteorological monitoring. These data must be reduced, evaluated, verified, and presented to KeySpan and the construction manager in a timely manner to facilitate decision-making. The data management process for each source of data is discussed below.

Analytical data generated at each fixed-station monitoring location are sent to the central computer system via radio telemetry. Proprietary software translates the data into Microsoft Excel format for data analysis, interpretation, and reporting. The fixed station baseline monitoring data will also be downloaded to the project database for data evaluation. The following daily charts or tables will be prepared:

- Instantaneous and averaged TVOC concentrations compared to the TVOC Action Limit
- Instantaneous and averaged RPM_{10} concentrations compared to the RPM_{10} Action Limit
- Supplemental Perimeter Walk-Around RPM_{10} concentrations compared to the Action Limit (if any)
- Supplemental Perimeter Walk-Around TVOC concentrations compared to the TVOC Action Limit (if any)

The following weekly charts or tables will be prepared and transmitted to the NYSDEC and NYSDOH:

- 15-minute average wind speed, wind direction, humidity, and air temperature
- Maximum 15-minute average concentrations of TVOC, RPM_{10} , and odor intensity
- Upwind and downwind comparison of Alert and Action Limits reached during the week
- Summary of site activities
- Air monitoring station locations

The air-monitoring contractor will review all real-time data in a timely manner following collection and transmit the summary report to KeySpan.

3. Contingency Plan

This section of the CAMP presents the air monitoring contingency plan. The purpose of the contingency plan is to identify potential site control measures that may be implemented in response to elevated levels of target compounds or odor measured during ground intrusive activities. In general, a tiered approach to site conditions with corresponding response actions will be implemented during the air monitoring program. The three tiers of site conditions are defined as follows.

- **Alert Level 1.** Normal or ambient air-conditions where all target concentrations are less than the Alert Limit (75 percent of the Action Limit).
- **Alert Level 2.** Concentration of at least one target is equal to or greater than Alert Limit (75 percent of the Action Limit), but less than the Action Limit.
- **Action Level.** Concentration of at least one target is equal to or greater than the Action Limit.

The contingency plan will rely on real-time data generated from the fixed-station monitoring, odor intensity monitoring, and meteorological monitoring. These data sources will be evaluated together in order to make appropriate decisions concerning site conditions and potential control measures.

An explanation of the notification system, specific conditions, and response actions for VOCs, RPM₁₀, and odor are presented below.

3.1 VOCs

TVOC concentrations in air will be measured and recorded by fixed-station monitors. Figure 4 presents the TVOC decision diagram that will be used to determine the appropriate site condition based on contaminant concentrations. Alert Level 1 site conditions will be in effect when the TVOC concentration is less than the Alert Limit (75 percent of the TVOC Action Limit of 5.0 ppm).

Under an Alert Level 1 site condition, each GC located at the fixed monitoring stations will operate in the TVOC mode, and will collect and analyze a TVOC sample at a frequency of one sample per minute.

A preliminary Alert Level 2 site condition will occur if the TVOC concentration measured at a fixed station is greater than or equal to the Alert Limit (75 percent of the

Action Level) but less than the Action Limit. Under a preliminary Alert Level 2 site condition, the GC, if used, at the fixed-station monitoring location where TVOC measured greater than 3.7 ppm will begin analyzing in the compound-specific mode. In the compound-specific mode, the concentration of each target VOC (benzene, toluene, m,p-xylene/ethylbenzene, and o-xylene) will be determined. The construction manager, KeySpan, and the air-monitoring contractor will be notified of elevated measurements and a possible Alert Level 2 site condition.

At this time, the upwind and downwind concentrations will be compared to determine if the preliminary Alert Level 2 site condition is due to site activities. If downwind TVOC concentrations are greater than upwind concentrations, then it will be assumed that the preliminary site condition is due to site activities.

If the above condition is true, then an Alert Level 2 site condition will be verified. Under a verified Alert Level 2 site condition, a contingency meeting attended by the air-monitoring consultant, KeySpan, NYSDEC or NYSDOH representatives, and the construction manager will be held to determine appropriate response actions. This meeting will be held within 60 minutes of the Alert Level 2 site condition verification. Possible Alert Level 2 response actions are listed in Table 1. The site will remain in Alert Level 2 as long as the TVOC concentration is between 3.7 ppm (alert limit) and 5.0 ppm (action limit), based on 15-minute averages.

If average TVOC concentrations increase to greater than the Action Limit of 5.0 ppm, then the site will enter into an Action Level site condition. An Action Level site condition will remain in effect if **either** of the following conditions are true.

- The average TVOC concentration, measured over a 15-minute period, is greater than or equal to 5.0 ppm (Action Limit)
- The instantaneous TVOC concentrations are greater than 25 ppm

Under an Action Level site condition, all construction activities will be halted. A meeting attended by the air monitoring consultant, NYSDEC or NYSDOH representatives, KeySpan, and the construction manager will be held within 60 minutes of the Action Level notification to determine appropriate response actions. Possible Action Level corrective measures/actions are listed in Table 1. After appropriate corrective measures/actions are taken, work activities may resume provided that the TVOC concentration at the site perimeter is no more than 5 ppm above background for the 15-minute average.

If average TVOC concentrations fall below the Action Limit, then the site will be returned to an Alert Level 2 site condition, at which time work activities may resume. The Alert Level 2 site condition will remain in effect as long as the following condition is true.

- The 15-minute average concentration for TVOCs is greater than 3.7 ppm (Alert Limit) and less than 5.0 ppm (Action Limit).

The site will return to Alert Level 1 site condition if the following condition is true.

- The 15-minute average concentrations for TVOCs at each of the fixed monitoring stations are less than 3.7 ppm (Alert Limit).

Under Alert Level 1 site condition, the GCs in each of the fixed stations that were in compound-specific mode will return to the TVOC mode of sampling.

Specific TVOC target concentrations for Alert Level 1, Alert Level 2, and Action Level site conditions are summarized in Table 2.

3.2 Respirable Particulate Matter

RPM₁₀ concentration in air will be measured and recorded by the fixed-station monitors. Figure 5 presents the RPM₁₀ decision diagram. Alert Level 1 site condition will be in effect when the downwind 15-minute average RPM₁₀ concentration is less than 100 $\mu\text{g}/\text{m}^3$ than the current average upwind conditions (Alert Limit). A preliminary Alert Level 2 site condition will occur if the RPM₁₀ concentration at a fixed station is greater than 100 $\mu\text{g}/\text{m}^3$. At this time, the construction manager, KeySpan, and the air-monitoring contractor will be notified of elevated measurements and a possible Alert Level 2 site condition. Under a preliminary Alert Level 2 site condition, upwind and downwind RPM₁₀ concentrations will be compared to determine if the preliminary Alert Level 2 site condition is due to site activities. If downwind RPM₁₀ concentrations are 100 $\mu\text{g}/\text{m}^3$ greater than upwind concentrations (Alert Limit), then it will be assumed that the preliminary Alert Level 2 site condition is due to site activities.

If elevated RPM₁₀ concentrations are found to be related to site activities, then RPM₁₀ measurements will be collected over a 15-minute period and averaged. If the 15-minute average RPM₁₀ concentration is equal to or greater than 100 $\mu\text{g}/\text{m}^3$ above the upwind RPM₁₀(alert limit), then the Alert Level 2 site condition will be verified.

The Alert Level 2 site condition will remain in effect as long as the average RPM_{10} concentration is greater than or equal to $100 \mu\text{g}/\text{m}^3$ above upwind conditions (Alert Limit), and less than or equal to $150 \mu\text{g}/\text{m}^3$ (Action Limit). Under a verified Alert Level 2 site condition, dust suppression techniques must be implemented. At this point, routine monitoring continues and 15-minute averages continue to be evaluated. Work may continue with dust suppression techniques provided that downwind RPM_{10} levels do not exceed $150 \mu\text{g}/\text{m}^3$ above the upwind level (Action Limit) and provided that no visible dust is migrating offsite from the work area. A contingency meeting attended by the air monitoring contractor, KeySpan, the NYSDEC or NYSDOH representatives, and the construction manager will be held within 60 minutes of the verified Alert Level 2 site condition if the condition is not mitigated by dust suppression techniques. Possible response actions for dust control are listed in Table 1.

An Action Level site condition will go into effect if the average 15-minute RPM_{10} concentration exceeds $150 \mu\text{g}/\text{m}^3$ above the current average upwind concentration (Action Limit). Under an Action Level site condition, work must be stopped and a meeting attended by the air monitoring contractor, KeySpan, the NYSDEC or NYSDOH representatives, and the construction manager will be held within 60 minutes of the Action Level notification to determine appropriate response actions. Possible Action Level response actions for RPM_{10} are listed in Table 1. Work may resume provided that dust suppression measures and other controls are successful in reducing the downwind RPM_{10} concentration to within $150 \mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

Specific RPM_{10} target concentrations for Alert Level 1, Alert Level 2, and Action Level site conditions are summarized in Table 2.

3.3 Visible Dust

In addition to measured RPM_{10} levels, the CAMP requires monitoring of visible dust conditions. If visible airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind RPM_{10} levels do not exceed $150 \mu\text{g}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.

3.4 Odor

Odors from MGP sites are generally negligible due to surface soil cover of contaminated materials. However, excavation work may expose these materials and odors may become detectable.

This may cause concern among the nearby community, visitors to the site, and on-site workers regarding potential health risks. Health risks or the potential for health risks do not rely strictly on detectable odors. A detectable odor does not indicate health risks. However, controlling odor emissions from a site can allay public fears about health risks and provide additional means of controlling nuisance emissions during remediation activities.

For MGP sites, the characteristic odor during remediation has been attributed primarily to naphthalene and indene, although additional compounds may contribute to the overall odor. (Pure naphthalene has the characteristic odor of mothballs). EPA provides a threshold for the initial presentation of naphthalene odors at $440 \mu\text{g}/\text{m}^3$ (ATSDR, 1995; Amoores and Hautala, 1983). There is no reported odor threshold for indene. Odors emanating from the site will be monitored for general odor intensity, as described below.

Odor intensity levels will be noted and recorded during as needed perimeter walk-around monitoring. Intensity levels will be based on the n-butanol scale as adapted from ASTM E544-99.

Figure 6 illustrates the odor decision diagram. An Alert Level 1 site condition will remain in effect if the odor intensity, based on the 8-point n-butanol scale, is less than 3 (Action Limit). An Action Level site condition will go into effect when odor intensities are greater than 3, based on the 8-point n-butanol scale, or there are odor complaints from the public.

If an Action Level site condition, due to odor, is verified, then a meeting attended by the air monitoring contractor, KeySpan, NYSDEC or NYSDOH representatives, and the construction manager will be held within 60 minutes of the Action Level to determine appropriate response actions. Possible Action Level responses are listed in Table 1.

3.5 Hydrogen Cyanide

Hydrogen cyanide will be monitored on the perimeter of the site if suspected cyanide-containing material (e.g. purifier waste) is encountered during excavation or work place monitoring detects confirmed levels of cyanide. Sampling will be performed every fifteen minutes if sulfur odor or suspected purifier material is encountered. Measurements will be made downwind, and will be recorded into the field notebook. In the event that hydrogen cyanide is detected, the following procedures will be implemented:

Hydrogen Cyanide Gas Air Monitoring Plan

Response Level	Actions
>1 ppm for 15-minute average using real-time meter (Alert Level 2)	Run Dräger CMS (chip monitoring system) Continue monitoring with real-time meter Continue work if CMS (Chip Measurement System) Dräger tube for hydrogen cyanide reads <0.5 ppm
>0.5 ppm on CMS Dräger tube (Alert Level 3)	Stop work and move (with continuous monitoring meter) at least 25 feet up-wind from excavation or until continuous monitoring meter registers <1 ppm Run CMS Dräger hydrogen cyanide chip and re-evaluate activities Continue monitoring with real-time meter May resume work if Dräger tube for cyanide reads <0.5 ppm
> 1 ppm for 15-minute average using real-time meter and < 0.5 ppm on CMS Dräger tube	Run CMS Dräger using hydrogen cyanide gas chip and confirm <0.5 ppm concentration Continue monitoring with real-time meter Run CMS Dräger tube using sulfur dioxide, hydrogen sulfide and phosphine chips to evaluate potential interference Recalibrate the real-time meter and continue to monitor the work zone.

NOTE: The ACGIH Threshold Limit Value (TLV) for Hydrogen Cyanide is 4.7 ppm.

4. Alternate Monitoring Procedures

The procedures noted above are directed towards the monitoring of perimeter air during the conduct of significant ground intrusive activities. Significant ground intrusive activities are those excavations on the main Rockaway Park site where there is reasonable expectation of encountering MGP-impacted materials. Where appropriate, an alternative level of monitoring which is in compliance with NYSDOH CAMP Guidance in DER-10 and equally protective of the community may be employed. Based on specific field activities, a decision will be made as to the appropriate level of monitoring. Specific activities could include pre-trenching and surface clearing activities for the installation of the subsurface barrier in the Bulkhead Area or additional geotechnical or environmental borings deemed necessary during the performance of the remedy. For these activities, monitoring may be performed using equipment and procedures similar to those used at the site during previous investigation activities as described below.

Real-time air monitoring for TVOCs and suspended particulates will be conducted upwind and downwind of the work area at the site perimeter. Real-time monitors will operate during periods of excavation/construction activity during working hours only.

Each alternative air monitoring station would include the following:

1. Station Tripod
2. An organic vapor analyzer
3. A particulate monitor

Instruments will be positioned to monitor from the breathing zone.

Each monitoring station will continuously measure and record TVOCs and RPM_{10} . All TVOC and RPM_{10} will be stored in dataloggers located within each monitoring station. Data from each piece of equipment will be downloaded daily at the completion of excavation/construction activities and stored on a central computer system. The location of each station, the work zone, and the wind direction will be noted daily. At each monitoring station location, the 15-minute average value of TVOC and RPM_{10} will be recorded. The 15-minute average value of TVOC and RPM_{10} data from the upwind and downwind station will be compared and resultant downwind concentration will be calculated and recorded.

If cyanide materials are encountered during excavation or work area monitoring detects a confirmed measurement of cyanide, cyanide will be monitored at the perimeter downwind. To monitor cyanide (as hydrogen cyanide gas), a real-time hand-held meter in conjunction with the Dräger Chip Measuring System (CMS) will be used. Types of continuously monitoring equipment include the V-RAE by Rae Systems and the Mini-Warn by Dräger Safety Systems and are available from rental equipment suppliers. Due to potential interference from sulfur compounds, hydrogen sulfide gas (H_2S) will also be monitored for comparison to the hydrogen cyanide gas levels detected. Hydrogen cyanide gas detections will also be confirmed with CMS Dräger tubes due to this interference. The Dräger CMS can quantify other gases that could potentially provide false positives for hydrogen cyanide gas (including sulfur dioxide, hydrogen sulfide, phosphine gas, hydrogen chloride, and nitrogen dioxide) detected by the real-time meter.

Tables

Table 1
Levels and Response Actions
CAMP Work Plan for Rockaway Park Former MGP Site
Rockaway Park, New York

Site Condition	Response Action
Alert Level 1	<ul style="list-style-type: none"> ▪ Normal Site Operations – No Response Action Required
Alert Level 2	<ul style="list-style-type: none"> ▪ Establish trend of data and determine if evaluation/wait period is warranted ▪ Temporarily stop work ▪ Temporarily relocate work to an area with potentially lower emission levels ▪ Apply water to area of activity or haul roads to minimize dust levels ▪ Reschedule work activities ▪ Cover all or part of the excavation area ▪ Apply VOC emission suppressant foam over open excavation areas ▪ Slow the pace of construction activities ▪ Change construction process or equipment that minimize air emissions ▪ Install a perimeter barrier fence
Action Level	<ul style="list-style-type: none"> ▪ Encapsulate construction area and treat air exhaust ▪ Perform work during cold weather ▪ Cease construction activities ▪ Re-evaluate air monitoring work plan

Notes:

The bulleted response actions specified under each site condition can be implemented in any order that is most appropriate under the existing site conditions.

Table 2
Target Concentrations for Site Conditions
CAMP Work Plan for Rockaway Park Former MGP Site
Rockaway Park, New York

Target	Alert Limit	Action Limit	Site Condition			
			Alert Level 1	Preliminary Alert Level 2	Alert Level 2	Action Level
Total VOC (GC)-ppmv	3.7	5.0	[C]<3.7	[C]>=3.7	NM	NM
Total VOC (PID)-ppmv	3.7	5.0	[C]<3.7	3.7<=[C]<=5.0	3.7<=[C _{avg}]<=5.0	[C _{avg}]>5.0
RPM ₁₀ -ug/m ³	100	150 greater than upwind	[C]<100	100<=[C]<=150	100<=[C _{avg}]<=150	[C _{avg}]>150
Odor (n-butanol scale)	NA	3	OI<3 and No Odor Complaints	NA	NA	OI>=3 or Odor Complaints
Odor (naphthalene) - ug/m ³	NA	440	[C]<440	N/A	N/A	[C _{avg}]>440
Hydrogen Cyanide - ppmv	NA	1	[C _{avg}]<1	[C _{avg}]>1	[C _{avg}]>1 (meter) and [C]>=0.5 (CMS)	[C _{avg}]>1 (meter) and [C]>=0.5 (CMS)

Notes:

VOC = Volatile Organic Compound

PID = Photoionization Detector

GC = Gas Chromatograph

RPM₁₀ = Respirable Particulate Matter

ppmv - parts per million volume

ug/m³ - micrograms per cubic meter

[C] = Concentration of target collected from a discrete sample.

[C_{avg}] = 15-minute average concentration of target.

NM = Target is not measured during this site condition.

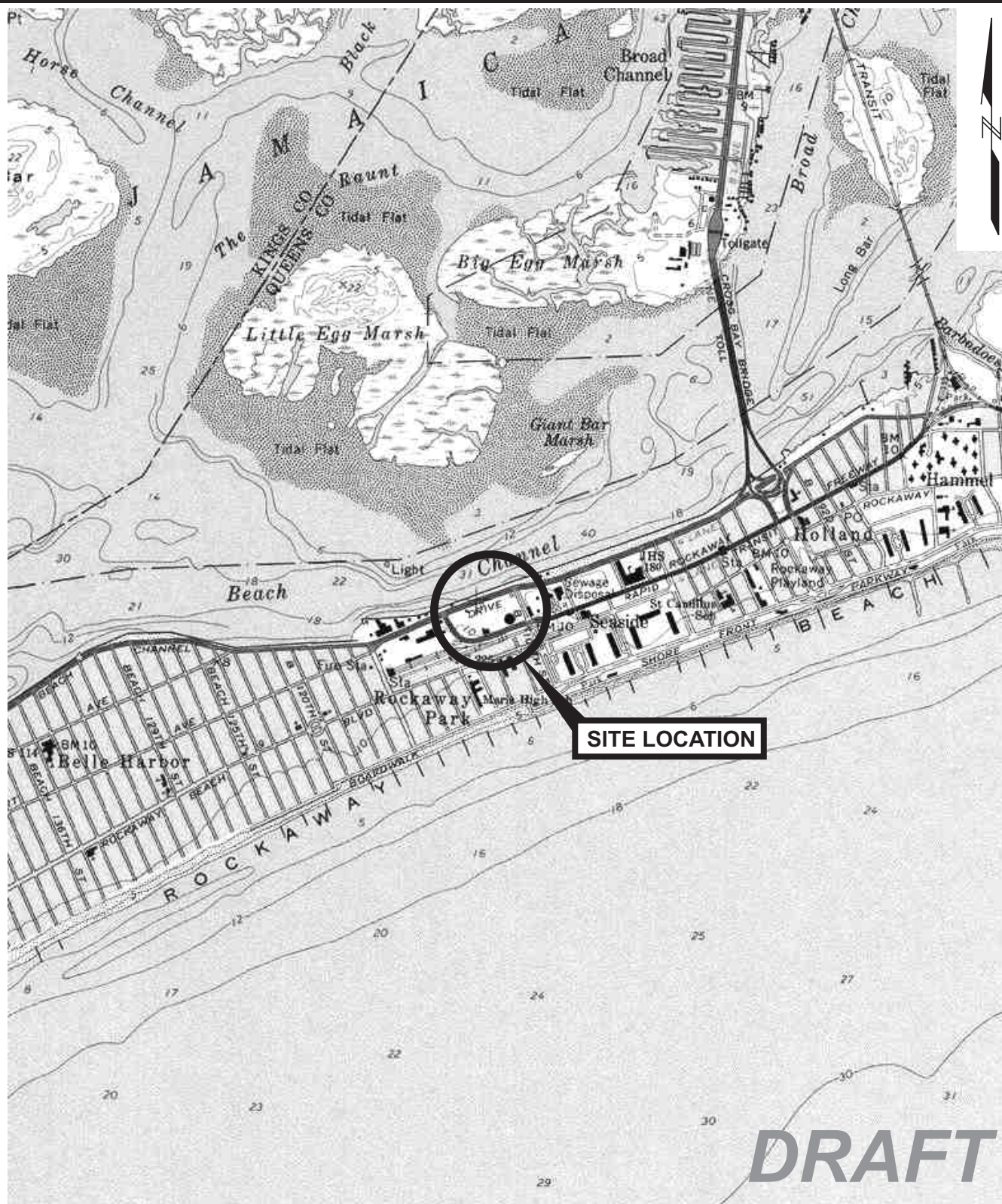
CMS - Chip monitoring system (Drager)

OI = Odor Intensity based on the n-butanol scale adapted from ASTM E544-99.

Odor measurements made over a 15 minute interval.

NA - Not applicable, odor intensity will be either an Alert Level 1 or Action Level; there is no Alert Level 2 for odor.

Figures



SOURCE: Map created with TOPO! © ©2003 National Geographic
(www.nationalgeographic.com/topo)



ROCKAWAY PARK FORMER MGP SITE
ROCKAWAY PARK, NEW YORK

KEYSPAN CORPORATION

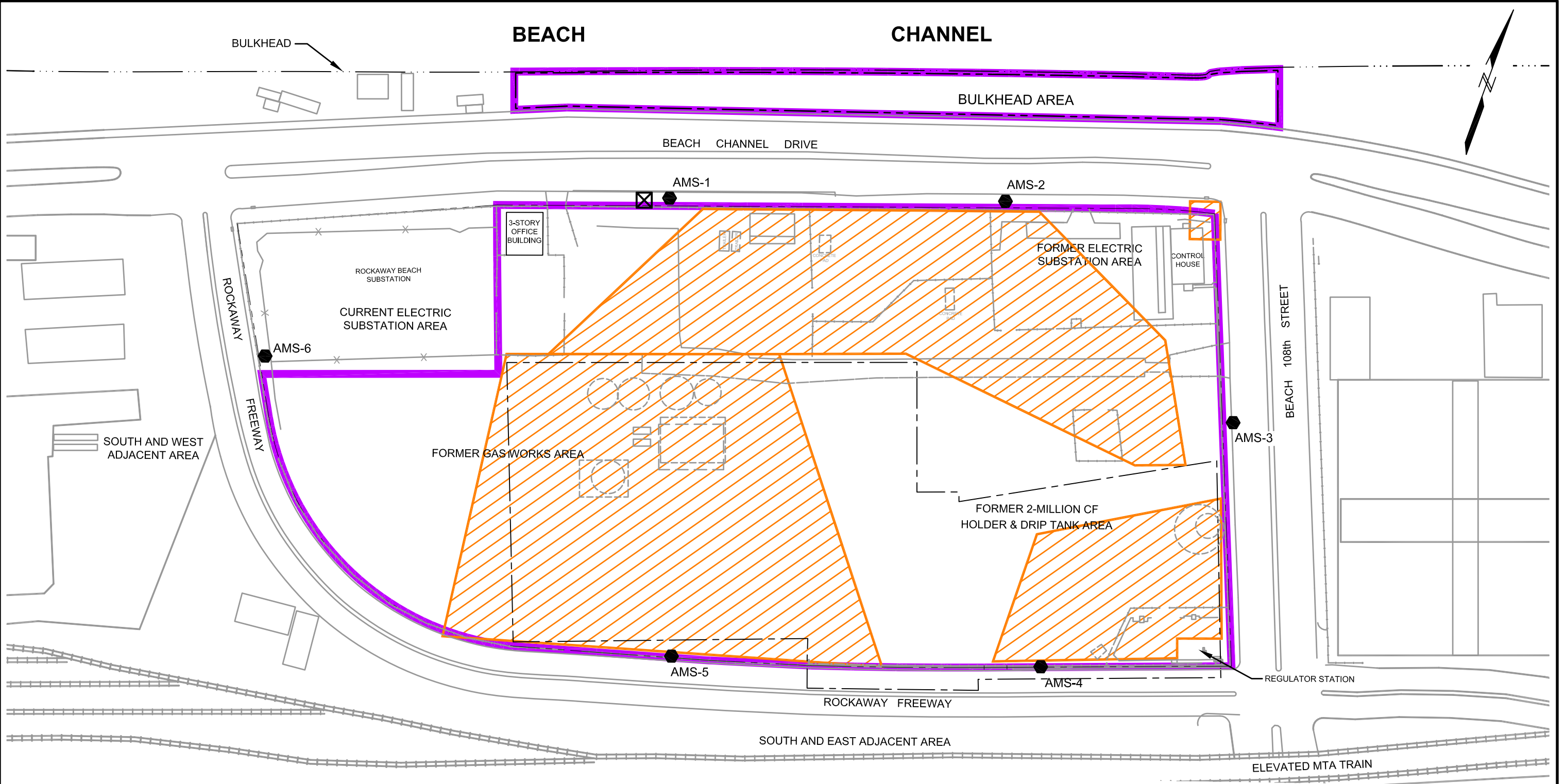


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SITE LOCATION MAP

February 2008

Figure 1



LEGEND


SITE WIDE CAP AREA

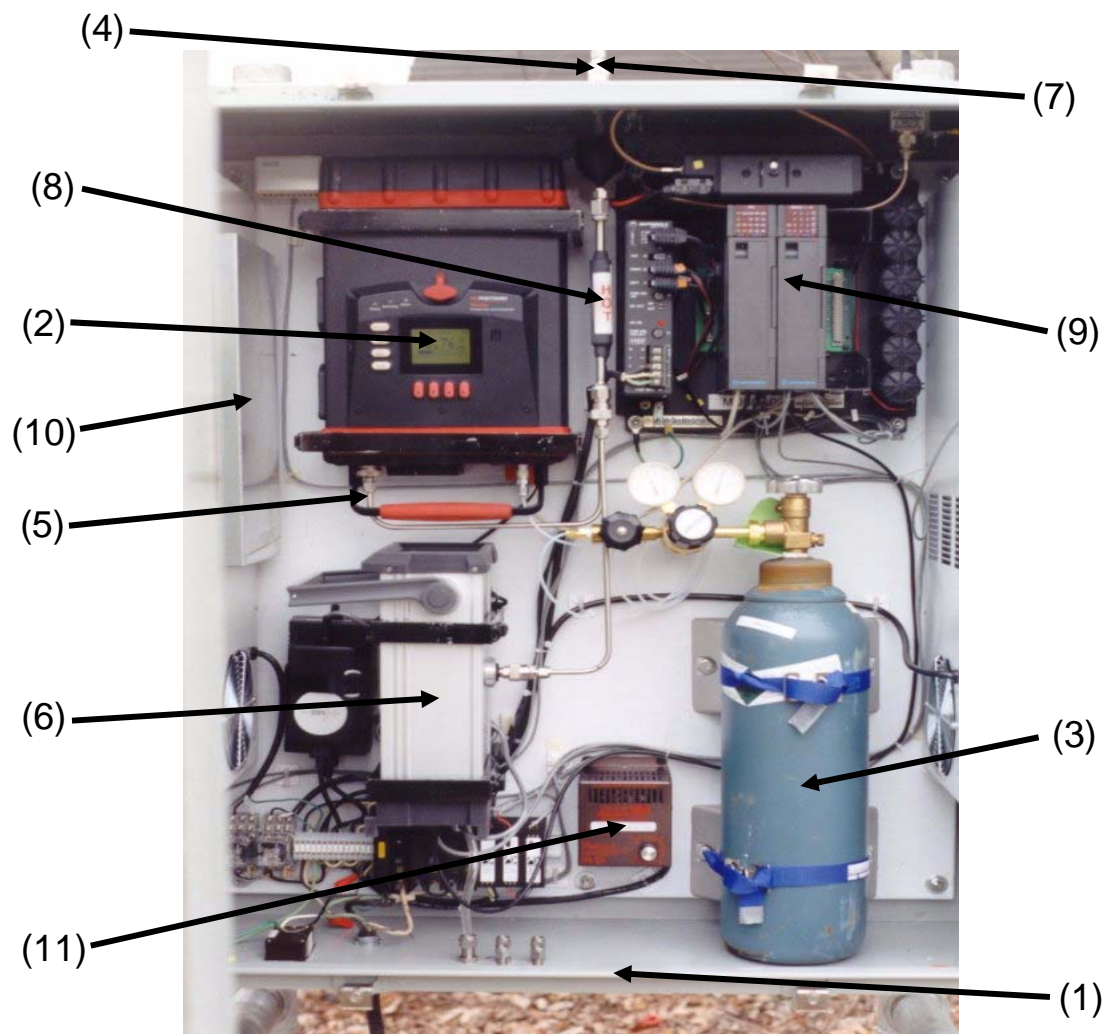
SHALLOW EXCAVATION AREA (APPROXIMATELY 8 FEET)

AMS-5 AIR MONITORING STATION LOCATION

METEOROLOGICAL STATION LOCATION

SOURCE:
 BASE MAP PREPARED FROM DVIRKA & BARTILUCCI (OCTOBER 2002)
 INTERPRETATION OF AERIAL PHOTOGRAPH DATED MARCH 31, 1998.

ROCKAWAY PARK FORMER MGP SITE ROCKAWAY PARK, NEW YORK		 GEI Consultants	SITE MAP AND AIR MONITORING STATION LOCATIONS	
KEYSPAN CORPORATION			Project 061140-17	February 2008
				Figure 2



1. Station enclosure
2. PhotoVac Voyager
gas chromatograph (GC)
3. GC carrier gas
4. GC sample inlet
5. GC sample inlet tubing
6. MIE DataRAM 2000
portable real-time
aerosol monitor
7. DataRAM sample inlet
with PM-10 impactor
8. DataRAM sample tubing
with in-line heater
9. Data communications device
10. Heat exchanger
11. Heater element

Note: Figure depicts an AirLogics, LLC Perimeter Air Monitoring System as an example and may not be representative of the actual system or components that will be employed at the Site

ROCKAWAY PARK FORMER MGP SITE
ROCKAWAY PARK, NEW YORK

KEYSPAN CORPORATION

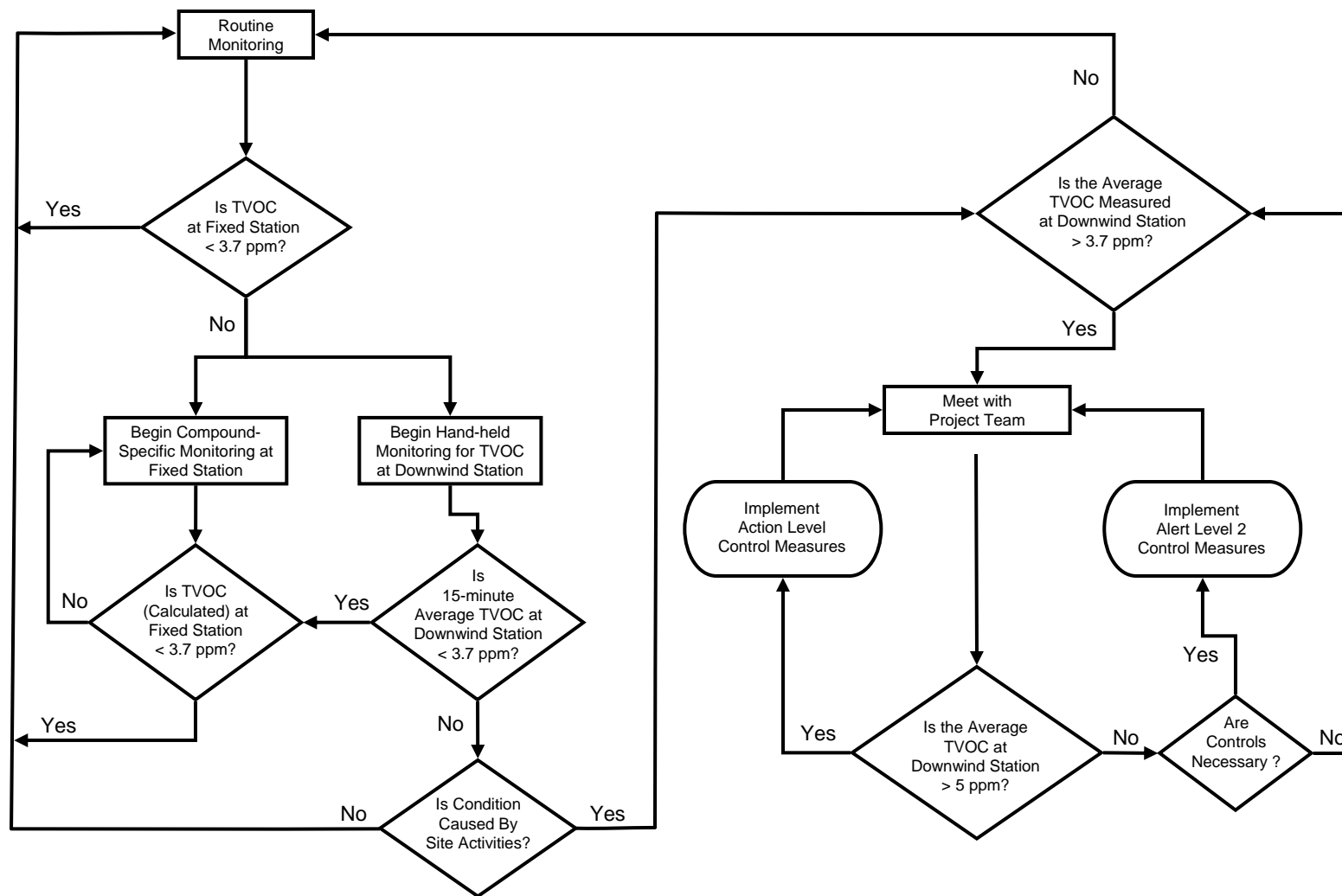


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**EXAMPLE
FIXED STATION
INTERNAL COMPONENTS**

FEBRUARY 2008

Figure 3



TVOC – Total Volatile Organic Compound
ppm – parts per million

ROCKAWAY PARK FORMER MGP SITE
ROCKAWAY PARK, NEW YORK

KEYSPAN CORPORATION

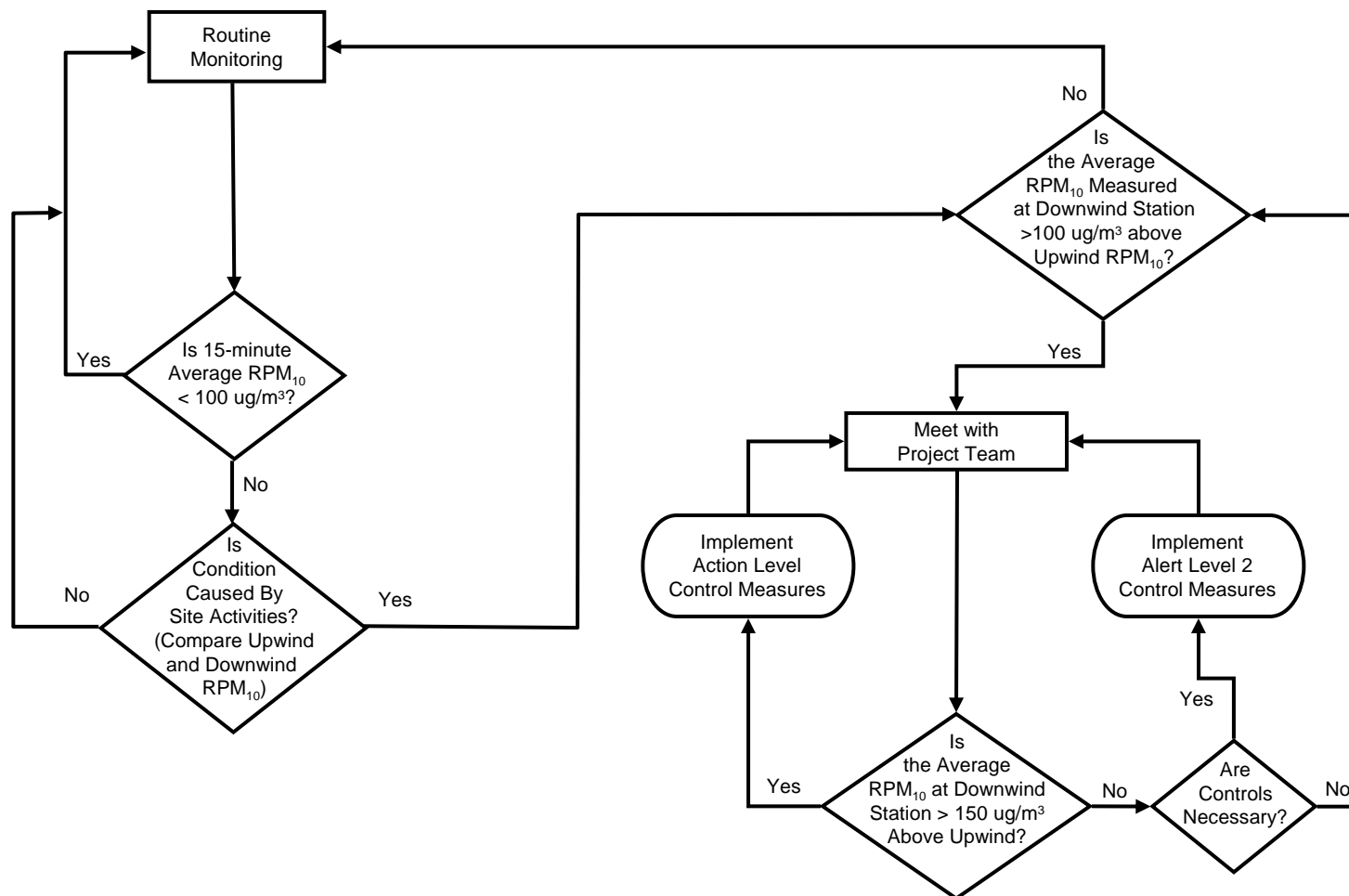


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**TVOC
DECISION DIAGRAM**

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Figure 4



RPM₁₀ – Respirable Particulate Matter
 ug/m³ – micrograms per cubic meter

ROCKAWAY PARK FORMER MGP SITE
 ROCKAWAY PARK, NEW YORK

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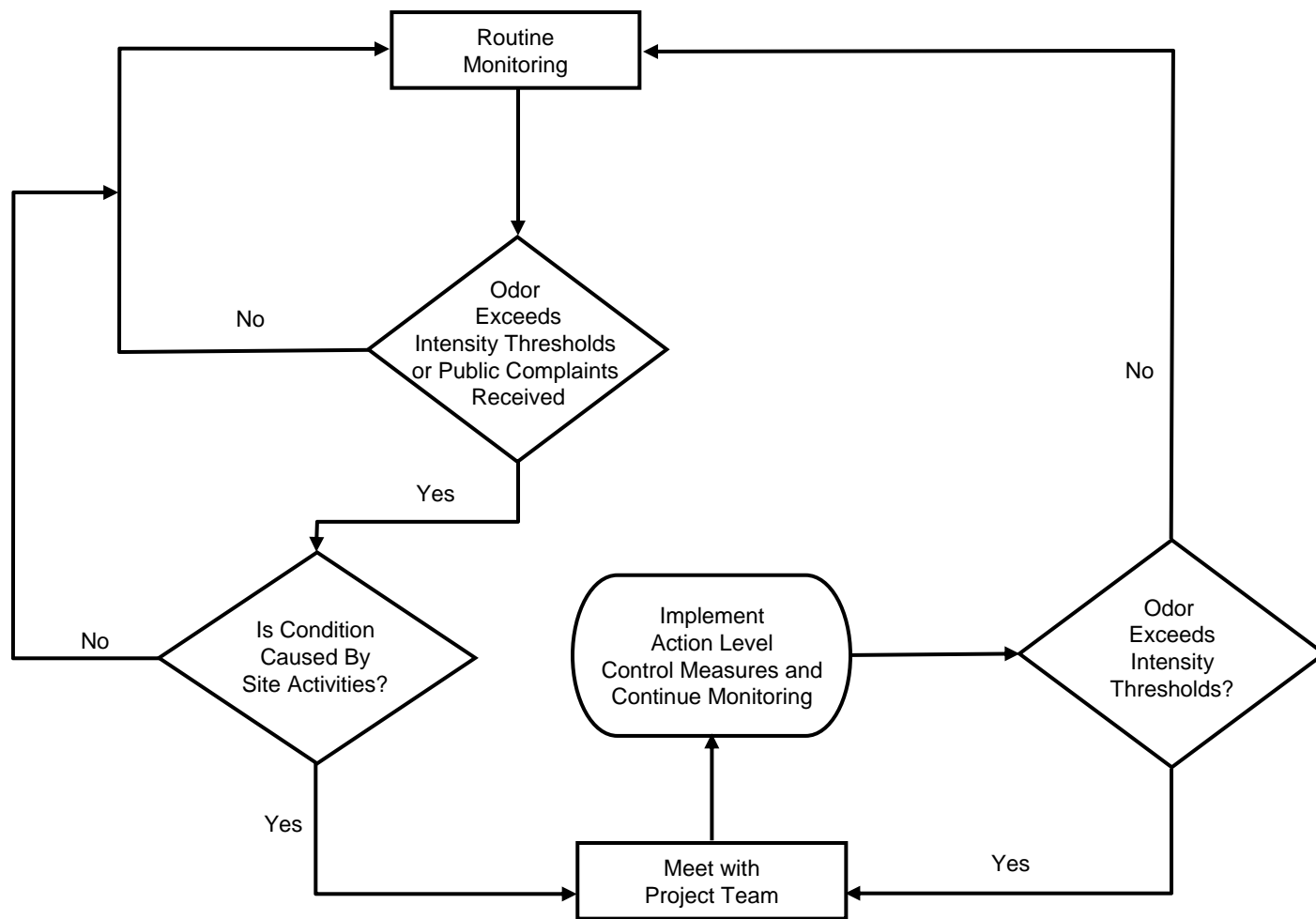


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**RESPIRABLE
 PARTICULATE MATTER
 DECISION DIAGRAM**

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Figure 5



ROCKAWAY PARK FORMER MGP SITE
ROCKAWAY PARK, NEW YORK

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**ODOR
DECISION DIAGRAM**

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Figure 6