

# **RELEASE ABATEMENT MEASURE STATUS REPORT NO. 22**

**129 COMMERCIAL STREET  
MALDEN, MASSACHUSETTS**

**RELEASE TRACKING NUMBER 3-0362**  
April 2009

*Prepared For:*



National Grid  
25 Research Drive  
Westborough, MA 01582

*Prepared By:*



Innovative Engineering Solutions, Inc.  
25 Spring Street  
Walpole, Massachusetts 02081  
(508) 668-0033

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Michael Lotti, L.S.P.  
Project Manager and LSP of Record  
License Number 4208

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Joseph E. Higgins, P.E., L.S.P.  
Project Reviewer

## **Release Abatement Measure Status Report No. 22**

### **129 Commercial Street Malden, Massachusetts 02148 DEP Release Tracking Number: 3-0362**

This Release Abatement Measure (RAM) Status Report has been prepared by Innovative Engineering Solutions, Inc. (IESI) on behalf of Massachusetts Electric Company d/b/a/ National Grid in accordance with the requirements of the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000). This RAM is being conducted at the 129 Commercial Street portion (Parcel B) of the former Malden manufactured gas plant (MGP) site (the "Site") in Malden, Massachusetts. The 129 Commercial Street property is currently occupied by a commercial bakery and is bounded to the north by Charles Street, to the east by Commercial Street, to the south by Adams Street, and to the west by the MBTA Orange Line commuter railway. The Massachusetts Department of Environmental Protection (DEP) assigned Release Tracking Number (RTN) 3-0362 to the Malden MGP Site. Figure 1 depicts the site locus and Figure 2 depicts the location of the property in relation to the disposal site boundary of the former MGP.

This RAM was initiated to address the potential migration of volatile organic compounds (VOCs) to indoor air at 129 Commercial Street. Although VOCs were historically detected in indoor air in the building at 129 Commercial Street, the detected concentrations did not constitute an imminent hazard for workers in the building, and were less than applicable occupational standards set by the US Occupational Safety and Health Administration (OSHA). However, remedial actions were implemented to reduce potential migration of VOCs to indoor air.

As indicated in the RAM Plan that was submitted to the DEP on July 2, 1998, the objective of the RAM was to reduce VOC concentrations in indoor air; this was initially attempted by sealing portions of the floor slab. The sealing of the floor was not completely successful in reducing indoor air concentrations, and the RAM was modified in April 1999 to include the installation of a sub-slab venting system (SSVS). The SSVS was installed in October 1999 and consists of five 2-inch diameter soil vapor extraction points installed horizontally through the foundation wall beneath the floor slab. The vapor extraction points extend approximately 5 feet beneath the building. These points are connected to a regenerative blower that removes vapors from beneath the floor slab and directs them through two granular activated carbon (GAC) drums (capacity of approximately 200 pounds each) for treatment. The blower and carbon drums are stored in a temporary building located east of the building along Commercial Street. Treated vapors are emitted through a 4-inch diameter vent pipe to the atmosphere. Figure 3 presents the locations of the extraction points and the system enclosure.

In order to evaluate the SSVS System's effectiveness as a risk reduction measure, as part of the October 2008 RAM Status report, IESI updated the human health risk characterization for a current worker at 129 Commercial Street using data collected since 2004 including indoor air sampling conducted in April 2008 by IESI. The air samples obtained in April 2008 were analyzed using the Air Petroleum Hydrocarbon method and the results indicate that concentrations were comparable to previous events. The detected carbon range fractions were also included in the updated risk calculations. The updated human health risk characterization indicated that the Estimated Lifetime Cancer Risk (ELCR) for a residential exposure scenario (not an actual exposure, calculated for reference and comparison) was calculated to be 8E-06; the ELCR for the worker scenario was calculated to be 2E-06. These calculated ELCRs are both below the MCP limit of 1E-05. The Hazard Index (HI) for a residential exposure scenario was calculated to be 0.8; the HI for the worker scenario was calculated to be 0.2. Both calculated HI values are below the MCP limit of 1.

The content of this report has been structured to address the specific information requirements set forth in 310 CMR 40.0445 (2)(a) through (e). This report was submitted electronically to the DEP via the eDEP website; a copy of the RAM Transmittal Form (BWSC-106) is included in Appendix A. In addition, in accordance with DEP requirements, the Remedial Monitoring Report (RMR; forms BWSC-106 A/B) was submitted electronically via the

eDEP website; a copy of the RMR is included in Appendix A. This RAM Status Report details on-going operation and maintenance of the sub-slab venting system, and summarizes monitoring data collected from October 8, 2008 through March 30, 2009.

**310 CMR 40.0445 (2)(a)      The status of response operations:**

The SSVS is monitored monthly as part of an ongoing operation and maintenance (O&M) schedule. Total VOC levels in influent and effluent vapor from the off-gas control device (sub-slab venting treatment unit) are measured during these visits with a photoionization detector (PID) calibrated to a 100 parts per million (ppm) isobutylene standard to respond as benzene. The results are summarized in Table 1 and discussed below.

**310 CMR 40.0445 (2)(b)      Any significant new site information or data:**

*SSVS data*

O&M visits have been conducted regularly throughout the reporting period. The monitoring data collected during this period are summarized on Table 1 and discussed below.

Vacuum conditions are monitored with fixed vacuum gauges on the influent piping prior to the blower and on the knockout drum. A portable vacuum gauge is used to periodically measure vacuum at the individual extraction points (EP-1 through EP-5). During this reporting period, vacuum at extraction points EP-1 through EP-5 ranged from 0.1 inch to 1.6 inches of water; vacuum at the blower ranged from 5.7 inches to 11.1 inches of water; vacuum at the knockout drum ranged from 3 inches and 7.6 inches of water; and discharge pressure ranged from 15.6 inches and 17.3 inches of water during this period. These measurements are generally consistent with other recent vacuum data for this system.

VOC levels are screened with a PID at 3 locations along the vapor stream: Influent (pre-GAC), Effluent-1 (post-GAC vessel 1) and Effluent-2 (post-GAC vessel 2). PID readings at the influent were consistent with background levels (0.0 ppm) as measured throughout the reporting period. PID readings at Effluent-1 and Effluent-2 were also consistent with background levels (0.0 ppm) throughout the reporting period.

Air flow in and out of the system is measured with an air velocity meter. During this reporting period, the influent air flow rate ranged from 89 cubic feet per minute (cfm, not adjusted for temperature and pressure) to 113 cfm; the effluent flow rate ranged from 88.5 cfm to 98 cfm. Note that the air flow rate has nearly doubled since the blower and GAC were replaced in April 2008.

**310 CMR 40.0445 (2)(c)      Details of and/or plans for the management of Remediation Waste, Remedial Wastewater, and/or Remedial Additives:**

No remediation waste was generated or disposed of during this reporting period. Approximately 7,955 pounds of spent carbon have been removed from the site since start-up of the sub-slab ventilation system in 1999.

**310 CMR 40.0445 (2)(d)      Any other information that the Department during its review and evaluation of a Status Report determines to be necessary to complete said Status Report, in view of site specific circumstances and conditions; and:**

The DEP has not required any additional information

**310 CMR 40.0445 (2)(e)**

**An LSP Opinion as to whether the Release Abatement Measure is being conducted in conformance with the RAM Plan and any conditions of approval established by the Department.**

Having reviewed the requirements of the RAM Plan and the response actions completed to date, we are of the opinion that the RAM is being conducted in accordance with the RAM Plan and the DEP Conditional Approval letters dated June 19, 1999 and July 27, 1999. DEP approval was necessary because at that time there was an ongoing Immediate Response Action (IRA) at the 100 Commercial Street property which is separate from the 129 Commercial Street property but part of larger Site RTN 3-0362. There are currently no ongoing IRAs at this location.

If you require additional information or have any questions regarding this status report, please contact Michael S. Lotti, LSP of IESI at (508) 668-0033 (x 231).

## FIGURES







Innovative Engineering Solutions, Inc.  
 25 SPRING STREET  
 WALPOLE, MASSACHUSETTS 02081  
 (508) 668-0033

0 2000

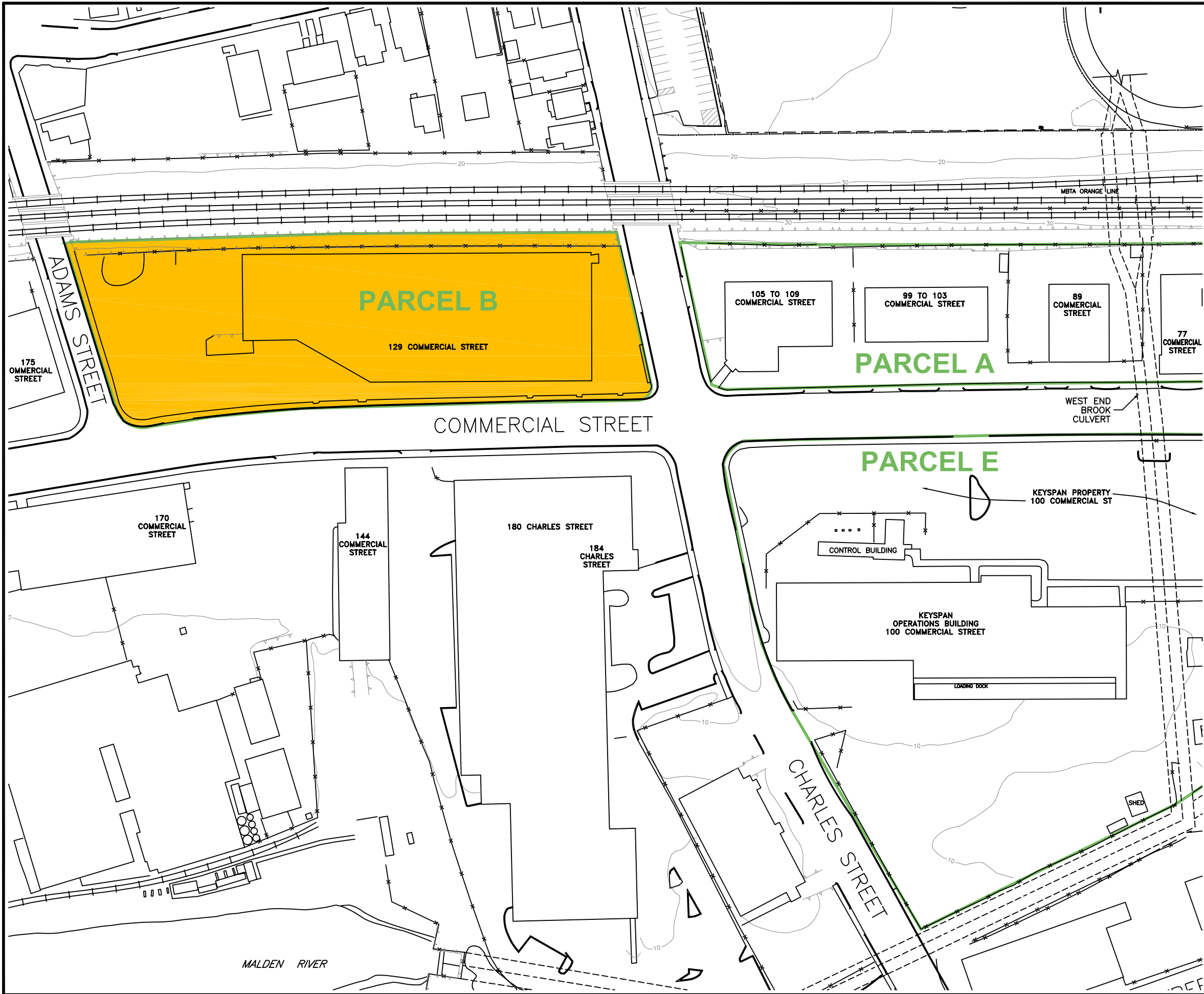
SCALE IN FEET  
 1:24000

SITE LAT/LONG: 42°25'30"N 71°04'30"W  
 UTM: 329,298E 4,699,051N ZONE 19  
 USGS Topographic Map:  
 Boston North, Massachusetts 1991

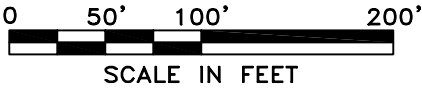
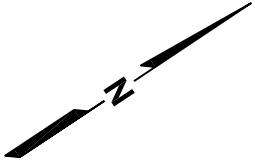
FIGURE 1  
**SITE LOCATION MAP**

Former Malden MGP Site  
 Malden, Massachusetts





RAM AREA



THIS PLAN BASED ON THE SITE PLAN DATED DECEMBER 2001  
BY HALEY & ALDRICH, INC.

HALEY & ALDRICH, INC. NOTES:

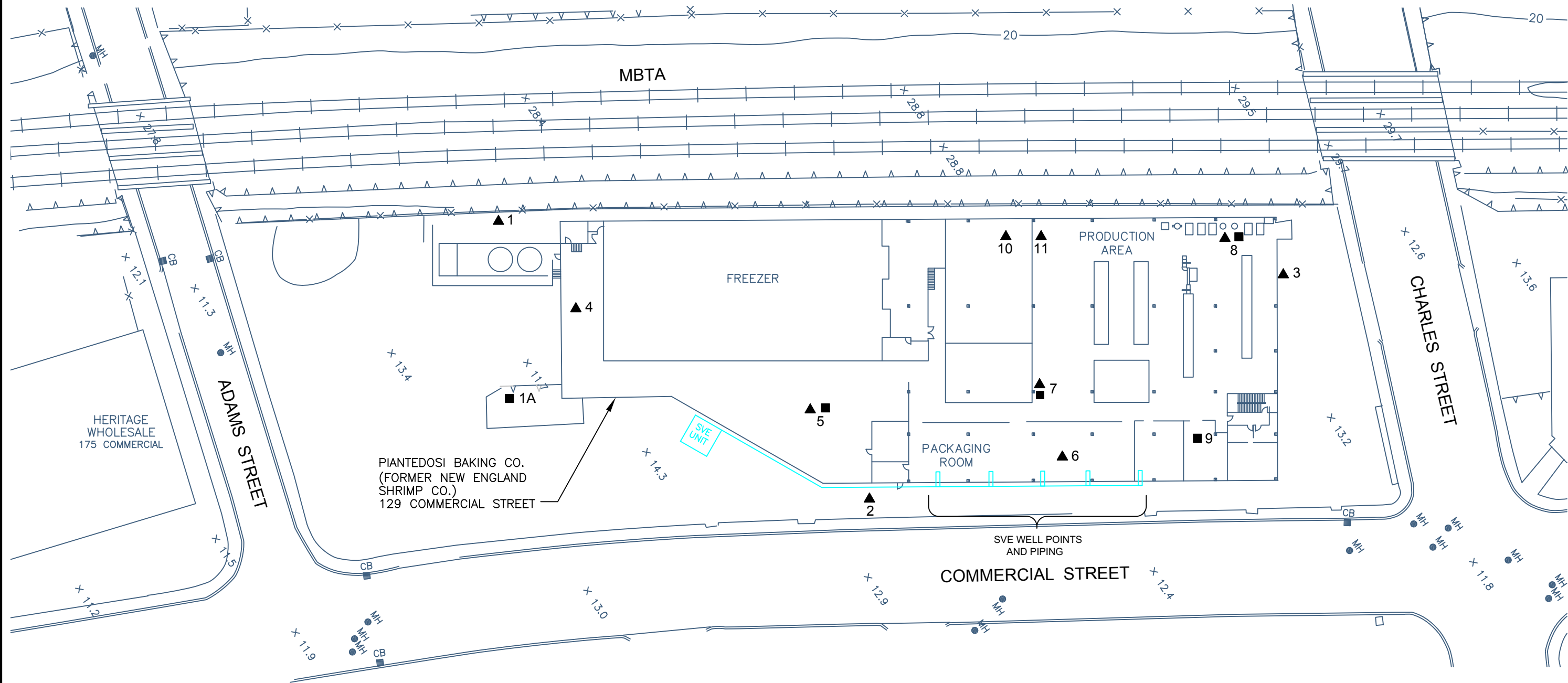
1. BASE PLAN ADAPTED FROM "TOPOGRAPHIC WORKSHEET  
OF THE MANUFACTURED GAS PLANT, MALDEN, MA"  
FOR MASSACHUSETTS ELECTRIC COMPANY,  
WESTBOROUGH, MA, BY EASTERN TOPOGRAPHICS,  
WOLFEBORO, NH, SHEETS 1 AND 2, AT A SCALE OF 1 IN.  
EQUALS 40 FT., JUNE 1995, AND CITY OF MALDEN  
ASSESSOR'S PLAN SHEET NO. 53, BY FAY, SPOFFORD &  
THORNDIKE, INC., BOSTON, MA, AT A SCALE OF 1 IN.  
EQUALS 40 FT., UPDATED JUNE 1976 AND REVISED  
30 JULY 1979.
2. LOCATION OF TEST BORINGS AND TEST PITS WERE  
DETERMINED BY HALEY & ALDRICH, INC.



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TITLE				
RAM AREA				
SITE				
FORMER MALDEN MGP SITE				
CLIENT				
NATIONAL GRID				
DRAWN	CHECKED	FILENAME	DATE	FIGURE
DMR	ML	NG MALDEN RAM AREAS	3/28/08	2



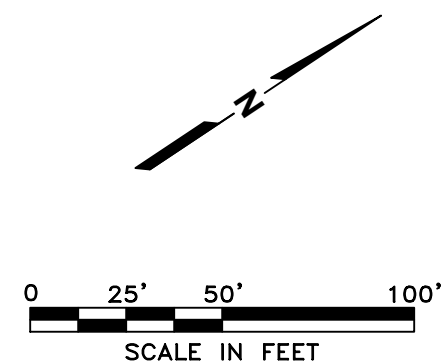


#### LEGEND

- 7 ▲ DESIGNATION AND APPROXIMATE LOCATION OF INDOOR AND OUTDOOR AIR SAMPLES OBTAINED BY ENVIRONMENTAL HEALTH & ENGINEERING, INC. AND HALEY & ALDRICH, INC. FROM NOVEMBER 1997 THROUGH FEBRUARY 2007
- 7 ■ DESIGNATION AND APPROXIMATE LOCATION OF INDOOR AIR SAMPLES OBTAINED BY OCCUHEALTH, INC., JUNE 1994
- DESIGNATION AND APPROXIMATE LOCATION OF "I" BEAM COLUMN LOCATION

#### NOTES

1. BASE PLAN ADAPTED FROM "TOPOGRAPHIC WORKSHEET OF THE MANUFACTURED GAS PLANT, MALDEN, MA" FOR MASSACHUSETTS ELECTRIC COMPANY, WESTBOROUGH, MA, BY EASTERN TOPOGRAPHICS, WOLFEBORO, NH, SHEETS 1 AND 2, AT A SCALE OF 1 IN. EQUALS 40 FT., JUNE 1995, AND CITY OF MALDEN ASSESSOR'S PLAN SHEET NO. 53, BY FAY, SPOFFORD & THORNDIKE, INC., BOSTON, MA AT A SCALE OF 1 IN. EQUALS 40 FT., UPDATED JUNE 1976 AND REVISED 30 JULY 1979.
2. INTERIOR FACILITY LAYOUT ADAPTED FROM UNDATED PLAN PROVIDED BY PIANTEDOSI BAKING COMPANY, FEBRUARY 1998.
3. APPROXIMATE LOCATIONS OF INDOOR AIR SAMPLING LOCATIONS WERE DETERMINED BY HALEY & ALDRICH, INC.



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TITLE

### SITE PLAN

FORMER MALDEN MGP SITE

CLIENT

NATIONAL GRID

DRAWN  
DMR

CHECKED  
ML

FILENAME  
NG MALDEN RAM AREAS

DATE  
3/28/08

FIGURE  
3

## TABLE

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**Table 1**  
**Sub-Slab Venting System Monitoring Data**  
**129 Commercial Street**  
**Malden, Massachusetts**

Monitoring Date	Total VOC Concentrations			Outdoor Ambient Air Temp. (°F)	Outlet Vapor Temp. (°F)	Flow Velocity (cubic ft./min)		System Vacuum (in. water)			Vacuum at Extraction Points (in. water)				
	Influent (ppm)	Effluent - 1 (ppm)	Effluent - 2 (ppm)			Influent	Effluent	Blower	Knockout Drum	Discharge	EP-1	EP-2	EP-3	EP-4	EP-5
17-Jan-08	0.0	-	0.0	34	84	65	157	10.5	2.8	40	1.7	2.1	0.0	0.0	2.5
18-Feb-08	0.0	-	0.0	64	90	60	140	9	2.7	41	2.1	2.3	0.0	0.0	2.4
28-Mar-08	0.0	-	0.0	37	96	59	145	8.2	1.6	47	0.0	1.5	0.0	0.0	1.6
10-Apr-08	0.0	0.0	0.0	65	88	113	98	8	4.1	18	1.9	1.6	1.6	0.4	1.6
10-May-08	0.0	0.0	0.0	60	80	97	95	9	5.8	17	1.6	1.8	2.0	0.1	1.5
10-Jun-08	0.0	0.0	0.0	95	104	89	93	8.7	5	16.3	1.8	1.8	1.6	0.3	1.8
16-Jun-08	(Reactivate System after power outage)														
7-Jul-08	0.0	0.0	0.0	88	100	89	88.5	8.7	5	16.2	1.5	1.5	1.5	0.1	1.4
12-Aug-08	0.0	0.0	0.0	85	94	94	91	9.6	5.8	16.2	1.8	1.9	1.4	0.3	1.3
8-Sep-08	0.0	0.0	0.0	80	100	90	86	10	6.5	15	1.2	1.8	1.2	1.2	1.6
23-Oct-08	0.0	0.0	0.0	50	95	108	94	9.1	5.5	17.3	1.2	1.2	0.3	0.3	1.3
7-Nov-08	0.0	0.0	0.0	55	85	96	86	10.2	7	15.6	1.1	1.1	1.4	0.2	1.2
3-Dec-08	0.0	0.0	0.0	45	80	93	96	5.7	3	17	0.9	0.9	1.6	0.2	1.1
6-Jan-09	0.0	0.0	0.0	35	60	70	94	8.5	5	17	1	1	0.7	0.1	1
11-Feb-09	0.0	0.0	0.0	50	80	72	95	11.1	7.6	16	1.2	1.2	1	0.2	1.1
4-Mar-09	0.0	0.0	0.0	32	80	95	88	9	5.7	17	1.3	1.2	1.3	0.9	1

**Notes & Abbreviations:**

ppm = Parts per million as measured with a PID

°F = Degrees Fahrenheit

cubic ft./min = Cubic feet per Minute (actual in field measurement, not adjusted for temperature and pressure)

in. water = Inches of water pressure/vacuum

- = Not Available/Not Measured

ND = Non Detect; method detection limit < 1ug/L



APPENDIX A

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**COPY OF RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM (BWSC-106) AND REMEDIAL  
MONITORING REPORT**