RELEASE ABATEMENT MEASURE

STATUS REPORT

51 & 100 COMMERCIAL STREET, AND 129 COMMERCIAL STREET MALDEN, MASSACHUSETTS

RELEASE TRACKING NUMBER 3-0362 April 2010

Prepared For:

nationalgrid

National Grid 40 Sylvan Road Waltham, MA 02154

Prepared By:



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

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| Prepared for: | National Grid 40 Sylvan Road Waltham, Massachusetts 02451 | | | | | |
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Release Abatement Measure Status Report 51 & 100 Commercial Street, and 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 (National Grid) in accordance with the requirements of the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000).

This RAM status report also combines the two ongoing RAMs at the former Malden manufactured gas plant (MGP) site (the "Site") located in the vicinity of Charles and Centre Streets along Commercial Streets in Malden, Massachusetts. The 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 RAM Areas in relation to the disposal site boundary of the former MGP. The former Malden MGP site has achieved a Temporary Solution and a Class C Response Action Outcome has been filed.

These RAMs are being conducted in accordance with 310 CMR 40.0896 in support of Post-RAO response actions. Only the RAM associated with the SSVS operation at 129 Commercial Street is considered necessary to maintain the Temporary Solution. The RAM for NAPL recovery at 51 and 100 Commercial Streets (one RAM) are considered definitive and enterprising steps toward reaching a Permanent Solution at this Site.

51/100 Commercial RAM

The RAM at the 51 Commercial Street and 100 Commercial Street(referred to herein as the "51/100 Commercial RAM") is being conducted in accordance with the RAM Plan that was submitted to the Massachusetts Department of Environmental Protection (DEP) on August 9, 2007. Figures 3 and 4 provide RAM Area details for 51 and 100 Commercial Street, respectively.

The objectives of the 51/100 Commercial RAM are to accomplish the following:

- 1. Install, start up, and conduct operation, maintenance, and monitoring (OMM) activities for a non-aqueous phase liquid (NAPL) recovery system at 51 Commercial Street.
- 2. Install a barrier beneath the proposed building at 51 Commercial Street.
- 3. Manage remediation waste generated during floor and foundation removal from the prior structure at 51 Commercial Street, construction of the new building foundation and Engineered Barrier under the foundation at 51 Commercial Street, and construction and operation of the NAPL recovery systems.
- 4. Restore, restart, and conduct OMM activities on an existing NAPL recovery system at 100 Commercial Street.

129 Commercial RAM

The RAM at the 129 Commercial Street and 100 Commercial Street(referred to herein as the "129 Commercial RAM") is being conducted in accordance with the RAM Plan that was submitted to the Massachusetts Department of Environmental Protection (DEP) on July 2, 1998.

The objective of the 129 Commercial RAM is 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 5 presents the locations of the extraction points and the system enclosure.

This report describes activities conducted on the 51/100 Commercial RAM between December 3, 2009 and March 8, 2010 and on the 129 Commercial RAM between October 8, 2009 through March 31, 2010. As such, 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). The RAM Status Report is presented below. The original RAM Transmittal Form (BWSC-106) was submitted electronically via eDEP.

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

During this reporting period, the activities have included gauging of the wells located at the 51 Commercial Street property, operation of the NAPL recovery system at 100 Commercial Street, and operation of the SSVS at the 129 Commercial Street property. Additional information regarding the status of these activities is presented below.

Well Gauging – 51 Commercial Street

As reported in December 2008, construction of the equipment shed structure is complete and equipment installation (e.g., air compressor, down well pumps, controls, etc.) was halted due to the lack of recoverable NAPL. The extraction wells were gauged on March 29,2010 during this reporting period. No measureable thicknesses of NAPL were observed in the extraction wells. Table 1 summarizes the well gauging data. IESI plans to continue to periodically gauge the wells to determine if recoverable NAPL is present.

NAPL System Operation – 100 Commercial Street

The NAPL recovery system located at the 100 Commercial Street parcel of the site was reactivated in August 2008. The system had been deactivated since 2003 because of slowed NAPL recovery. During each visit, the recovery well was gauged, the system's safety interlocks were checked, the amount of NAPL and water recovered was measured, and the thickness of NAPL in the recovery well was measured. Table 2 summarizes the data collected during this reporting period.

The total amount of NAPL recovered this period is approximately 20 gallons. The total volume of NAPL collected since 2001 from this system is approximately 1,103 gallons.

SSVS Operation – 129 Commercial Street

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 3 and are consistent with past operations.

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

As stated in the introduction, these RAMs will be combined and reported together on an April 7 and October 7 schedule. Data collected during this reporting period are similar to previous reporting periods.

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

There were no shipments of remediation waste this reporting period. As stated in the August 2007 RAM Plan, NAPL recovered by the 100 Commercial Street system is stored in 55-gallon drums until filled, then replaced with an empty drum. The filled drum of NAPL is removed within 90 days of being filled.

At the 129 Commercial RAM, since start-up of the sub-slab ventilation system in 1999 approximately 7,955 pounds of spent carbon have been removed from the site. The carbon was last changed in April 2008.

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 additional information, and the DEP did not impose any conditions on the right to conduct the RAM.

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.

If you require additional information or have any questions regarding this status report, please contact Michael Lotti, LSP of IESI at (508) 668-0033 (x 231) or Michele Leone at National Grid at (781) 907-3651.

FIGURES











TABLES

Table 1 Monitoring Well Gauging Data 51 Commercial Street Malden, Massachusetts

| Well Location | Date | Depth to LNAPL ² (ft) | Depth to Depth t Water ¹ DNAPL (ft) (ft) | | DNAPL Thickness (ft) | Well Bottom Depth (ft) | |
|---------------|------------------------|--|---|----|----------------------------|---------------------------------|--|
| | 05-Sen-07 | ND | 8 00 | | - | 12 50 | |
| | 05 Oct 07 | | 0.00 0 20 | | | 12.30 | |
| EW-1 | 03-001-07 | | 6.30 | | | 11.40 | |
| | 10-Sep-08 | | 6.40 7.00 | | - | 11.45 | |
| | 10-5ep-08 | ND | 6.81 | | - | 12 35 | |
| | 01-Jun-09 | ND | 7.06 | ND | - | 12.35 | |
| | 14-Sep-09 | ND | 7.12 | ND | - | 12.07 | |
| | 29-Mar-10 | ND | 5.68 | ND | - | 12.33 | |
| | 05-Sep-07 | ND | 9.25 | ND | - | 14.20 | |
| FW/-2 | 05-Oct-07 | ND | 9.55 | ND | - | 14.20 | |
| 200 2 | 01-May-08 | ND | 7.81 | ND | - | 13.50 | |
| | 10-Sep-08 | ND | 9.22 | ND | - | 13.59 | |
| | 11-Feb-09 | ND | 8.05 | ND | - | 13.69 | |
| | 01-Jun-09 | | 8.31 9.20 | | - | 13.69 | |
| | 14-3ep-09 29-Mar-10 | | 6.92 | | - | 13.57 | |
| | 05-Sep-07 | ND | 9 55 | | - | 14 40 | |
| | 05-Oct-07 | ND | 9.66 | ND | _ | 14.45 | |
| EW-3 | 01-May-08 | ND | 7.51 | ND | - | 11.80 | |
| | 10-Sep-08 | ND | 7.87 | ND | - | 11.9 | |
| | 11-Feb-09 | ND | 7.80 | ND | - | 13.52 | |
| | 01-Jun-09 | ND | 8.00 | ND | - | 13.52 | |
| | 14-Sep-09 | ND | 8.01 | ND | - | 13.52 | |
| | 29-Mar-10 | ND | 6.70 | ND | - | 13.56 | |
| | 05-Sep-07 | ND | 9.90 | ND | - | 15.25 | |
| EW-4 | 05-Oct-07 | ND | 10.06 | ND | - | 14.90 | |
| | 01-May-08 | ND | 7.89 | ND | - | 12.00 | |
| | 10-Sep-08 | ND | 8.21 | | - | 13.77 | |
| | 11-Feb-09 | | 8.17 | | - | 14.35 | |
| | 01-Jun-09 | | 9.35 | | - | 14.35 | |
| | 14-Sep-09 | | 8.39 | | - | 14.35 | |
| | 05 Son 07 | | 10.90 | | - | 14.33 | |
| | 05-0ct-07 | ND | 10.80 | | - | 14.10 | |
| EW-5 | 01-May-08 | ND | 7.80 | ND | - | 11.65 | |
| | 10-Sep-08 | ND | 8.14 | ND | - | 11.71 | |
| | 11-Feb-09 | ND | 8.09 | ND | - | 12.3 | |
| | 01-Jun-09 | ND | 9.32 | ND | - | 12.3 | |
| | 14-Sep-09 | ND | 8.31 | ND | - | 12.3 | |
| | 29-Mar-10 | ND | 6.93 | ND | - | 12.28 | |
| | 05-Sep-07 | ND | 10.35 | ND | - | 14.36 | |
| EW-6 | 05-Oct-07 | ND | 10.50 | ND | - | 14.20 | |
| | 01-May-08 | ND | 8.16 | ND | - | 13.00 | |
| | 10-Sep-08 | | 8.01 | | - | 12.77 | |
| | 01_lup_09 | | 0.40 | | - | 13.09 | |
| | 14-Sen-09 | ND | 8.66 | | - | 13.09 | |
| | 29-Mar-10 | ND | 6.88 | ND | - | 13.11 | |
| | 05-Sep-07 | - | DRY | - | - | 9.92 | |
| | 05-Oct-07 | - | DRY | - | - | 10.00 | |
| EW-7 | 01-May-08 | ND | 6.50 | ND | - | 7.20 | |
| | 10-Sep-08 | ND | 6.99 | ND | - | 7.81 | |
| | 11-Feb-09 | ND | 7.09 | ND | - | 7.28 | |
| | 01-Jun-09 | ND | 7.09 | ND | - | 7.28 | |
| | 14-Sep-09 | ND | /.10 | ND | - | /.28 | |
| | 29-IVIAR-10 | | 0.41 קק | | - | 10 00 | |
| 00A-B903-OW | 10-Sep-08 | ND | 8.28 | ND | - | 15.2 | |

Notes:

1. Depth to liquid measurements are obtained using a water level indicator and/or an oil-water interface probe.

2. DNAPL = Dense Non-Aqueous Phase Liquids. LNAPL = Light Non-Aqueous Phase Liquids.

3. ND=Not detected.



Table 2 Recovery Well RW-1 Gauging Data 100 Commercial Street Malden, MA

| Date | Depth to Water | Depth to | Depth to Bottom | Thickness NAPL | Total Gallons | Gallons Per Day | |
|------------|-------------------|----------|--------------------|----------------|------------------|--------------------|--|
| | water | | Dottom | | Recovered | | |
| 8/5/2008 | 1.68 | 8.80 | 14.30 | 5.50 | 36 | 36.00 | |
| 8/6/2008 | 1.75 | 11.00 | 14.30 | 3.30 | 83 | 47.00 | |
| 8/7/2008 | 1.70 | 12.00 | 14.30 | 2.30 | 83 | 0.00 | |
| 8/11/2008 | 1.43 | 13.10 | 14.30 | 1.20 | 83 | 0.00 | |
| 8/12/2008 | 1.43 | 13.10 | 14.30 | 1.20 | 117 | 34.00 | |
| 8/21/2008 | 1.86 | 12.70 | 14.30 | 1.60 | 167 | 5.56 | |
| 8/26/2008 | 1.85 | 11.55 | 14.30 | 2.75 | 178 | 2.20 | |
| 9/2/2008 | 2.00 | 10.60 | 14.30 | 3.70 | 186 | 1.14 | |
| 9/8/2008 | 2.60 | 11.80 | 14.30 | 2.50 | 203 | 2.83 | |
| 9/18/2008 | 1.95 | 11.10 | 14.30 | 3.20 | 217 | 1.40 | |
| 10/1/2008 | 1.35 | 14.30 | 14.30 | 0.00 | 227 | 0.77 | |
| 10/9/2008 | 1.72 | 13.48 | 14.30 | 0.82 | 235 | 1.00 | |
| 10/23/2008 | 2.10 | 13.26 | 14.30 | 1.04 | 248 | 0.93 | |
| 11/7/2008 | 2.40 | 13.80 | 14.30 | 0.50 | 256 | 0.53 | |
| 11/22/2008 | 2.05 | 13.75 | 14.30 | 0.55 | 262 | 0.40 | |
| 12/3/2008 | 1.62 | 14.30 | 14.30 | 0.00 | 267 | 0.45 | |
| 1/6/2009 | 1.60 | 14.10 | 14.30 | 0.20 | 281 | 0.41 | |
| 1/30/2009 | 1.41 | 13.97 | 14.30 | 0.33 | 281 | 0.00 | |
| 2/11/2009 | 1.90 | 14.29 | 14.30 | 0.01 | 281 | 0.00 | |
| 3/11/2009 | 1.60 | 13.30 | 14.30 | 1.00 | 281 | 0.00 | |
| 4/7/2009 | 0.50 | 14.11 | 14.30 | 0.19 | 293 | 0.44 | |
| 5/13/2009 | 1.00 | 14.21 | 14.30 | 0.09 | 294 | 0.03 | |
| 6/3/2009 | 1.88 | 14.25 | 14.30 | 0.05 | 294 | 0.00 | |
| 6/19/2009 | 0.00 | 14.23 | 14.30 | 0.07 | 294 | 0.02 | |
| 6/29/2009 | 1.40 | 13.34 | 14.30 | 0.96 | 295 | 0.06 | |
| 7/17/2009 | 1.76 | 12.97 | 14.30 | 1.33 | 296 | 0.04 | |
| 7/29/2009 | 1.52 | 13.85 | 14.30 | 0.45 | 315 | 1.62 | |
| 8/24/2009 | 1.65 | 13.76 | 14.30 | 0.54 | 331 | 0.62 | |
| 9/14/2009 | 1.90 | 13.40 | 14.30 | 0.90 | 341 | 0.48 | |
| 10/7/2009 | 1.90 | 13.40 | 14.30 | 0.90 | 358 | 0.72 | |
| 11/3/2009 | 1.80 | 14.19 | 14.20 | 0.01 | 364 | 0.22 | |
| 11/23/2009 | 1.83 | 14.10 | 14.20 | 0.10 | 369 | 0.25 | |
| 12/18/2009 | 1.70 | 14.19 | 14.20 | 0.01 | 374 | 0.20 | |
| 1/8/2010 | 2.20 | 14.10 | 14.20 | 0.10 | 379 | 0.24 | |
| 2/3/2010 | 1.80 | 14.00 | 14.20 | 0.20 | 384 | 0.19 | |
| 2/15/2010 | 2.10 | 14.10 | 14.20 | 0.10 | 389 | 0.42 | |
| 3/2/2010 | 1.30 | 14.10 | 14.20 | 0.10 | 394 | 0.33 | |

Notes NAPL - non-aqueous phase liquid All data collected by IESI personnel



Table 2 Recovery Well RW-1 Gauging Data 100 Commercial Street Malden, MA





Table 3 Sub-Slab Venting System Monitoring Data 129 Commercial Street Malden, Massachusetts

| Monitoring Total VOC Concentrations | | | | | Flow Velo ft./ı | city (cubic nin) | System Vacuum (in. water) | | | Vacuum at Extraction Points (in. water) | | | | | |
|-------------------------------------|-------------------|-----------------------|-----------------------|--------------------------------------|-------------------------------|---------------------|---------------------------|--------|------------------|---|------|------|------|------|------|
| Date | Influent (ppm) | Effluent - 1 (ppm) | Effluent - 2 (ppm) | Outdoor Ambient Air Temp. (°F) | Outlet Vapor Temp. (°F) | 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 p | ower 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 |
| 13-Apr-09 | 0.0 | 0.0 | 0.0 | 50 | 70 | 94 | 75 | 9 | 4.6 | 17 | 0.7 | 0.7 | 0.7 | 0.1 | 0.7 |
| 13-May-09 | 0.0 | 0.0 | 0.0 | 55 | 83 | 94 | 75 | 9 | 4.2 | 17.1 | 1 | 1 | 0.9 | 0.1 | 0.9 |
| 19-Jun-09 | 0.0 | 0.0 | 0.0 | 45 | 86 | 108 | 88 | 8.1 | 4.6 | 17.1 | 0.8 | 1.1 | 1 | 0.1 | 1.2 |
| 17-Jul-09 | 0.0 | 0.0 | 0.0 | 68 | 104 | 104 | 92 | 19 | 10.5 | 40.2 | 0.7 | 1 | 1 | 0.1 | 1.1 |
| 24-Aug-09 | 2.6 | 1.5 | 0.6 | 88 | 100 | 103 | 87 | 7.8 | 4.6 | 15.4 | 0.4 | 1.2 | 1.1 | 0.15 | 1.5 |
| 14-Sep-09 | 0.0 | 0.0 | 0.0 | 72 | 94 | 98 | 90 | 10 | 6 | 16.5 | 0.8 | 0.7 | 0.4 | 0.1 | 0.8 |
| 7-Oct-09 | 0.0 | 0.0 | 0.0 | 59 | 85 | 103 | 83.4 | 10.5 | 7 | 15.5 | 0.8 | 0.8 | 0.9 | 0.4 | 0.8 |
| 23-Nov-09 | 0.0 | 0.0 | 0.0 | 52 | 80 | 95 | 94 | 11 | 7.4 | 16.5 | 0.9 | 0.6 | 1 | 1 | 0.6 |
| 18-Dec-09 | 0.0 | 0.0 | 0.0 | 10 | 65 | 38.2 | 93.6 | 4.3 | 0.3 | 17.4 | 0.1 | 0.1 | 0.1 | 0.1 | 0.3 |
| 8-Jan-10 | 0.0 | 0.0 | 0.0 | 23 | 70 | 72 | 101 | 7.5 | 4.3 | 18 | 1 | 0.3 | 0.6 | 0.1 | 0.3 |
| 3-Feb-10 | 0.0 | 0.0 | 0.0 | 25 | 70 | 71 | 95 | 7.8 | 4.8 | 18.3 | 1.1 | 0.4 | 0.8 | 0.1 | 1.1 |
| 2-Mar-10 | 0.0 | 0.0 | 0.0 | 45 | 80 | 85 | 96 | 8.1 | 8.1 | 16.9 | 1 | 0.4 | 0.7 | 0.1 | 1.2 |

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

