

THE CITY OF PROVIDENCE  
STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

---

# RESOLUTION OF THE CITY COUNCIL

No. 272

EFFECTIVE ~~Approved~~ June 17, 2013

IT IS HEREBY RESOLVED, That His Honor, the Mayor, is authorized to grant non-exclusive sub-surface easement below Public Street and its abutting sidewalk areas in the City of Providence to The Narragansett Electric Company, d/b/a National Grid ("National Grid"). Said easement shall be granted specifically upon the following provisions:

1. The easement shall be utilized only for the installation and maintenance of a below-grade stone collection trench across the eastern end of Public Street between Lots 325 and 489 in an area twenty-six (26) feet across and three (3) feet wide; the installation of two (2) 60-inch diameter concrete manholes and associated stormwater piping within the eastern end of Public Street between Lots 325 and 489 as part of the stormwater management system integration; and temporary access to an area of Public Street measuring approximately 26-feet wide and 120-feet long for a period of approximately three weeks to complete installation. The temporary construction easement shall not exceed 3,011.86 square feet and the perpetual easement shall not exceed 305.53 square feet, plus or minus, with dimensions indicated as a shaded area on the accompanying plan entitled: "Providence, RI Department of Public Works - Engineering Office, Street Line Section Plan No. 064843 dated April 9, 2013."

2. The easement shall be deemed to run with the land and shall operate against any successors in title and the easement or a memorandum of same shall be recorded by National Grid in the Office of Land Records for the City of Providence.

3. National Grid shall tender to the City the sum of five thousand three hundred four dollars and seventy five cents (\$5304.75) in legal tender of the United States of America, of which three thousand thirty two dollars and fifty cents (\$3,032.50) will be paid for the perpetual easement and two hundred seventy two dollars and twenty five cents (\$272.25) will be paid for the temporary construction easement.

4. National Grid shall execute an indemnification and hold-harmless agreement with the City of Providence, to be approved by the City's Department of Law.

5. National Grid shall supply the City of Providence with a comprehensive general liability insurance policy during the period of construction naming said City of Providence, its agents, officers, servants and employees as additional-named insureds in a sum not less than one hundred thousand dollars (\$100,000.00) which policy shall be approved by the City's Department of Law.

6. National Grid shall restore the portion of Public Street affected by construction to substantially its previous condition.

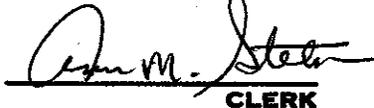
7. Such other terms and conditions as may be reflected in the record and minutes of the City Council Committee on Public Works and/or as may be deemed appropriate by the Mayor or the Department of Law.

**IN CITY COUNCIL  
JUN 06 2013**

**READ AND PASSED**

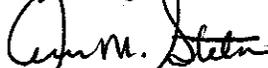
  
\_\_\_\_\_

**PRES.**

  
\_\_\_\_\_

**CLERK**

**Effective without the  
Mayor's Signature**

  
Anna M. Stetson  
City Clerk



**PROVIDENCE POLICE DEPARTMENT**

**Colonel Hugh T. Clements  
Chief of Police**

**TRAFFIC Bureau**

*Sergeant Paul F. Zienowicz, Commanding*



5-29-13

To: Anna Stetson, City Clerk  
From: Sgt. Paul Zienowicz, Traffic Bureau  
Subject: Easement of Public St

Dear Ms. Stetson,

I have responded to Public St east of Allens Ave. in reference to the Narragansett Electric Co. request for easement of same. Traffic in the area in question will not be adversely affected by this easement.

At this time, the Providence Police Department has no objections to the proposal as it is represented on the plans provided for review.

Respectfully,

Sgt. Paul Zienowicz



Department of Public Works  
Engineering Division  
William C. Bombard PE, Chief Engineer

April 11, 2013

Honorable Terrence Hassett  
Chairman of the Public Works Committee  
Providence City Council-City Hall  
Providence, R.I. 02903

**RE: Proposed Easement on a portion of Public Street**

Dear Councilman Hassett:

This department has no objection to the proposed easement on a portion of Public St. in conjunction with the attached plan, entitled "Prov., R.I.-P.W. Dept- Engineering Office, Street Line Section, Plan No. 064843. Area of easement is designated as shaded area on the accompanying plan.

No sewer easement required.  
Total square footage of easement equals 305.53 square feet. (±)  
See accompanying plan for plat and lot numbers.

If we can further assist you in this regard, please advise.

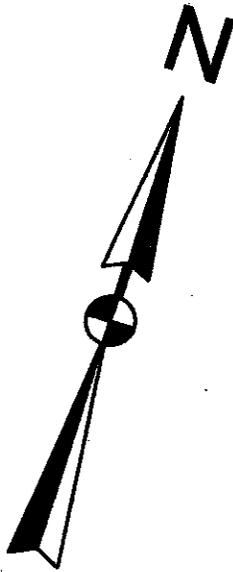
Very truly yours,

William C. Bombard  
Acting Director

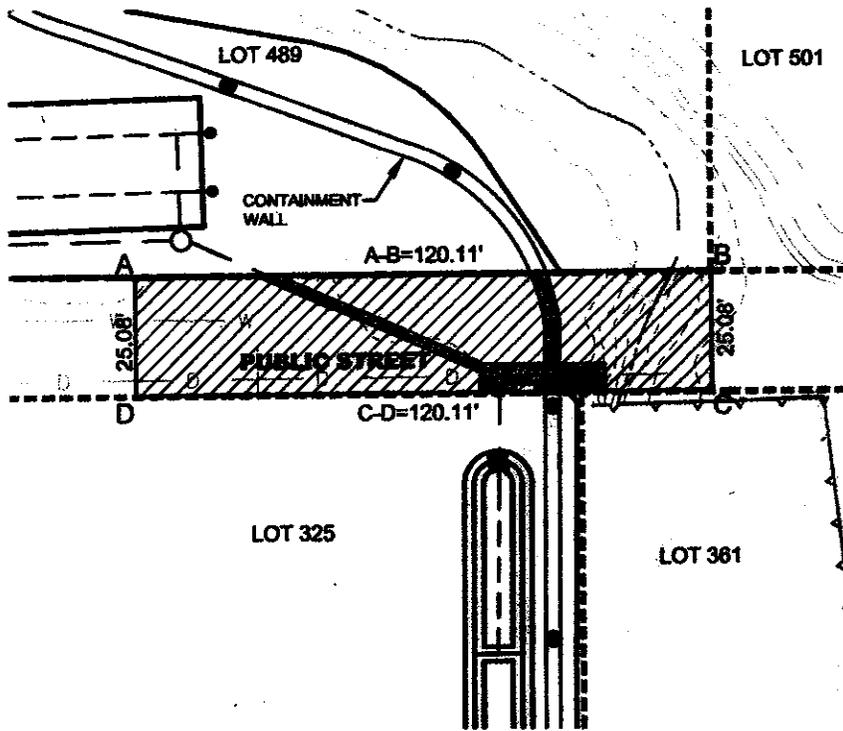
cc: Ann Stetson-City Clerk  
BB, AZ-DPW  
A. Southgate, Esq.- Law Dept.  
D. Quinn- Tax Assessors  
J. Bennett-Planning

**PROVIDENCE THE CREATIVE CAPITAL**

700 Allens Avenue | Providence, Rhode Island 02905 | 401 467 7950 OFFICE | 401 941 2567 FAX  
www.providenceri.com



PROVIDENCE, R.I.  
 P. W. DEPT. ENGINEERING OFFICE  
 STREET LINE SECTION  
 Plan No. 064843  
 Date April 9, 2013



- Notes: Hatched area (A-B-C-D-A) delineates the *temporary construction work area*; total square footage = 3,011.86  
 ▲ Gray shaded area indicates *proposed easement*; total square footage = 305.53

CITY OF PROVIDENCE, R.I.  
 Public Works Dept. Engineering Office  
 Showing Proposed easement for Public Street  
 Drawn by M. Strubel Checked by \_\_\_\_\_  
 Scale 1"=40' Date 4-9-2013  
 Correct \_\_\_\_\_ Associate Engr.  
 Approved William C. [Signature] CHIEF ENGINEER

Lot numbers taken from A.P. 46

▲ REV. N° 1 MAY 17, 2013



552 Academy Avenue  
Providence, RI 02908

401-521-6300

[www.provwater.com](http://www.provwater.com)

January 22, 2013

Councilman Terrence M. Hassett  
Providence City Council  
Providence City Hall  
25 Dorrance Street  
Providence, RI 02903

The Hon. Angel Taveras  
*Mayor*

Boyce Spinelli  
*General Manager*

**Subject:      Petition for Street Easement  
                  Public Street  
                  Providence, RI**

Dear Councilman Hassett:

The referenced Public Street Easement Petition to the City Council has been reviewed for any impact this action might have on the Providence Water (PW) water distribution system. Our records indicate that we have an active 8-inch ductile iron water main, a fire hydrant and active services along your requested site. Accordingly, these mains, services and hydrants must remain active.

PW has no objection to your requested abandonment as long as the Petitioner grants Providence Water a full utility easement allowing PW to maintain, construct, repair, etc. the existing water main and its appurtenances and that no permanent construction, whatsoever, be allowed within the easement. The easement shall comprise the entire existing right of way of this public roadway. Actual dimensions and wording of the easement shall be subject to review by PW as to form and content. All construction must be coordinated with PW inspections division.

If you have any further questions, please feel free to contact me at (401) 521-6300, extension 7215.

Respectfully,  
PROVIDENCE WATER SUPPLY BOARD

Peter J. Pallozzi  
Manager – Planning & Development

cc:   P. LePage  
      J. Brosco  
      A. Pion  
      A. Stetson, City Clerk  
      R. Mann  
      File

BOARD OF DIRECTORS

Brett P. Smiley  
*Chairman*

Joseph D. Cataldi  
*Vice Chairman*

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*Ex-Officio*

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*City Council President*

Michael J. Correia  
*City Councilman*

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Joan S. Badway  
*Member*

Carissa R. Richard  
*Secretary*

William E. O'Gara, Esq.  
*Legal Advisor*

Member

Rhode Island Water Works Assn.  
New England Water Works Assn.  
American Water Works Assn.  
Water Research Foundation

An EPA WaterSense Partner

Only Tap Water Delivers

ANGEL TAVERAS  
Mayor



**Providence Parks Department**

*"Building Pride in Providence"*

**FILED**  
2013 JAN - 8 P 1:35  
DEPT. OF CITY CLERK  
PROVIDENCE, R.I.

**MEMORANDUM**

**TO: ANNA STETSON, CITY CLERK**  
**FROM: ROBERT F. MCMAHON, SUPERINTENDENT OF PARKS**  
**DATE: JANUARY 7, 2013**  
**RE: PUBLIC STREET EASEMENT**

*Robert F. McMahon*

The Parks Department has no objection to the petition from National Grid requesting to grant a permanent easement on Public Street.



ANDOLFO APPRAISAL ASSOCIATES, INC.

REAL ESTATE APPRAISERS AND CONSULTANTS  
THE BUSH BUILDING  
216 WEYBOSSET STREET • PROVIDENCE • RHODE ISLAND 02903  
(401) 273-8989 • FAX (401) 273-2510

May 29, 2013  
(Amended from April 22, 2013)

Mr. David Quinn  
City Tax Assessor  
City of Providence  
25 Dorrance Street  
Providence, Rhode Island 02903

Re: Proposed Perpetual Easement and Temporary Construction Easement Across  
Public Street, Providence

Dear Mr. Quinn:

Pursuant to your request we have personally inspected the real estate located on Public Street, otherwise designated as Lots 325 and 489 on Plat 46 of the Tax Assessor's Plat Maps for the City of Providence, State of Rhode Island. The subject is located in the Upper South Providence neighborhood of the city.

The purpose of our inspection and subsequent analysis was to estimate the "as is" fee simple market values of a 15-day temporary construction easement and a perpetual easement for storm water management, or any other purpose, as requested by National Grid. Notably, the easement is needed by National Grid in order for the company to comply with Rhode Island Department of Environmental Management Remediation Regulations as relating to the former Cargill site at 170 Allens Avenue.

Specifically, the proposed easements will run along the center line of Public Street (for 120.11 feet along the length of the parcel and 25.08 feet in width). The temporary easement contains 3,011.86 square feet, while the permanent easement, as located within the boundaries of the temporary easement area, contains 305 square feet according to a map supplied by National Grid. The subject is located in a W-3 Waterfront: Port/maritime Industrial District. The City's Department of Public Works has no objection to this request; however, they will require a Class 1 Survey for recording prior to sale.

We have taken into account a number of factors in arriving at the fee simple market value for the requested easement. The petitioner will gain use of the parcel to further enhance the commercial viability or use of the Cargill site and any other adjacent properties that they may have an interest in.

ANDOLFO APPRAISAL ASSOCIATES, INC.

Mr. David Quinn  
Page 2  
May 29, 2013  
(Amended from April 22, 2013)

Based on an analysis of comparable sales as contained within the offices of Andolfo Appraisal Associates, Inc., a value of \$22.00 per foot is hereby estimated for this site.

For the perpetual easement, this value must be reduced by 25% due to fact that the City is not giving up its full fee ownership of the property, i.e., the street, as the proposed easement will affect only a portion of it.

Perpetual Easement

305 square feet x \$22.00 per square foot = \$6,710 x 75% = \$5,032.50

Temporary Construction Easement

3,011.86 square feet x \$22.00 p/square foot = \$66,261 fee simple market value

\$66,261 x .10 land earnings rate x \$6,626.10 annual rent

\$6,620.10 ÷ 365 days = \$18.15 rent per day

15 days of construction x \$18.15 per day = \$272.25

Therefore, total compensation due to the City has been calculated at \$5,304.75 given this revised scope of work as submitted by the petitioner, National Grid.

Respectfully submitted,

ANDOLFO APPRAISAL ASSOCIATES, INC.

*William G. Floriani (fud)*

William G. Floriani  
Certified Residential Appraiser

*Thomas S. Andolfo, MAI*

Thomas S. Andolfo, MAI  
Certified General Appraiser

WGF:TSA/fad

# P

**City Plan Commission**  
Angel Taveras, Mayor

January 25, 2013

Councilman Terrence Hassett,  
Chair, Committee on Public Works  
Providence City Hall  
25 Dorrance Street  
Providence, RI 02903

Attn: Anna Stetson, City Clerk

**Re: Referral 3361 - Petition for easement on Public Street**

**Applicant: National Grid**

Dear Councilman Hassett:

This letter is in response to a request from the Committee on Public Works for the Department of Planning and Development's (DPD) opinion on the above-referenced matter.

The petitioner has requested that a permanent easement be granted at the eastern end of Public Street between lots 325 and 489 in an area approximately 30 feet across and 3 feet wide. The easement is necessary to implement remedial environmental action for the site at 170 Allens Avenue. The DPD has reviewed a draft of plans showing the extent of the requested easement area.

The DPD has no objection to the proposed easement and recommends to the Committee on Public Works that the easement be granted.

Sincerely,



Christopher Ise  
Administrative Officer

cc: Robin L Main on behalf of Narragansett Electric  
Anna Stetson, City Clerk

DEPARTMENT OF PLANNING AND DEVELOPMENT  
444 Westminster Street, Providence, Rhode Island 02903  
401 680 8400 ph | 401 680 8492 fax  
[www.providenceri.com](http://www.providenceri.com)



85 High Street  
Pawtucket, RI 02860

March 22, 2013

Lori L. Hagan  
Second Deputy City Clerk  
25 Dorrance Street  
Providence, Rhode Island 02903

Attn: Ms. Lori L. Hagan

RE: PETITION TO GRANT A PERMANENT EASEMENT ON PUBLIC STREET

Upon investigation by our in house Engineer Juan Hernandez; it has been determined that Verizon presently has aerial facilities on said Public Street.

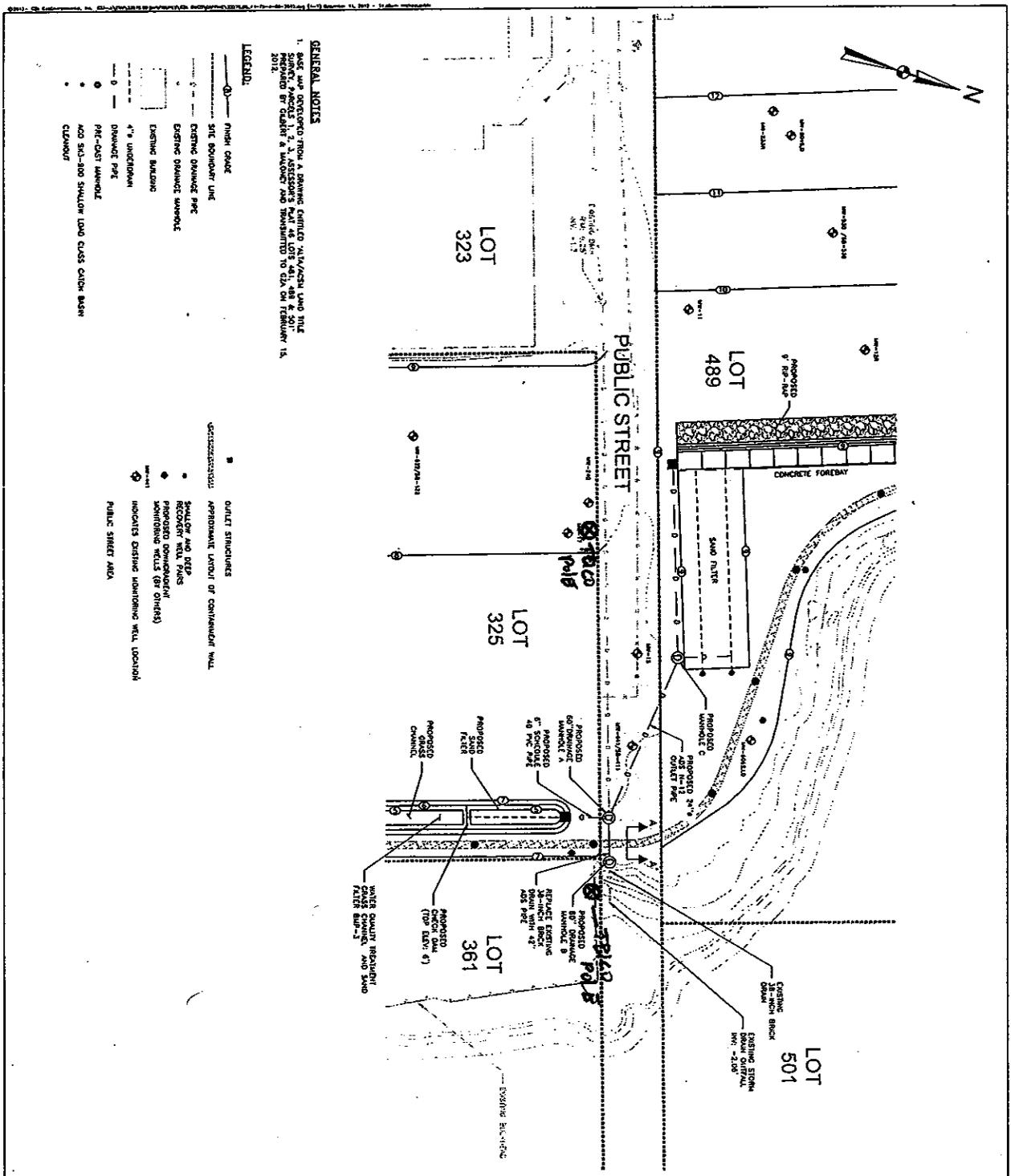
These facilities include a pole line with cables and wires that provides service to the surrounding area.

Verizon will not object to the granting of said easement, provided that Verizon will continue retention of its facilities in existing locations with the right to inspect, maintain, operate and replace the same and with twenty-four hour access to said facilities. Also, the right to place underground facilities on said Public Street should it be necessary in the future.

If it is decided by the petitioner that telephone facilities are to be relocated, the petitioner will assume all costs of the relocation.

Very truly yours,

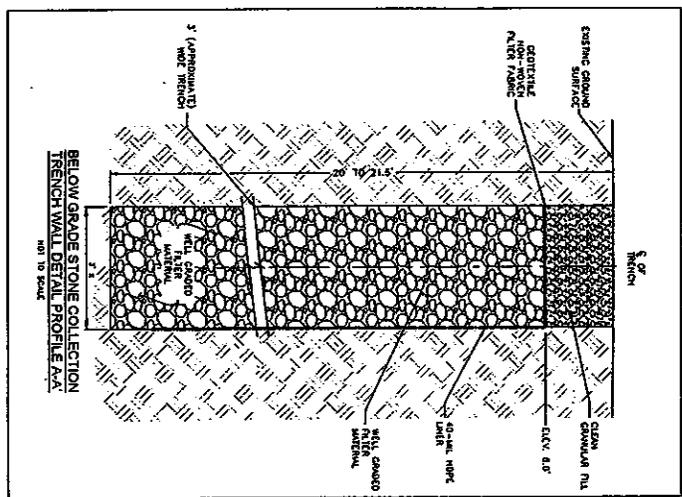
Mary C. Hanley  
Manager - Right of Way  
401-727-9555



**GENERAL NOTES**

1. BASE MAP DEVELOPED FROM A DRAWING CAPTURED VIA/AQWA AND THE INFORMATION IS FOR GENERAL REFERENCE ONLY. THE USER SHALL VERIFY THE ACCURACY OF THE INFORMATION PROVIDED BY CADSWAT, AERIALS AND TRANSMITTED TO GSA ON FEBRUARY 15, 2012.

- LEGEND**
- FINISH GRADE
  - SITE BOUNDARY LINE
  - EXISTING DRAINAGE PIPE
  - EXISTING DRAINAGE MANHOLE
  - EXISTING BUILDING
  - 4" UNIDIRECTIONAL DRAINAGE PIPE
  - PRE-CAST MANHOLE
  - 400 S&S-300 SHALLOW LOAD CLASS CATCH BASIN
  - CURBOUT
  - OUTLET STRUCTURES
  - APPROXIMATE LAYOUT OF CONVICTION WALL
  - BOUNDARY AND SETBACK
  - PROPOSED DRAINAGE/SEWER MONITORING WELLS (BY OTHERS)
  - INDICATES EXISTING MONITORING WELL LOCATION
  - PUBLIC STREET AREA



THE INFORMATION SHOWN ON THIS DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE PROJECT AND IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE USER SHALL VERIFY THE ACCURACY OF THE INFORMATION PROVIDED BY CADSWAT, AERIALS AND TRANSMITTED TO GSA ON FEBRUARY 15, 2012. THE USER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE USER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE USER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

SCALE: 1" = 20'

NO.	REV./DESCRIPTION	BY	DATE

170 ALLENS AVENUE  
PROVIDENCE, RHODE ISLAND

EXHIBIT A  
PUBLIC STREET AREA

PROVIDED BY: GSA Engineering and Services  
PROJECT NO: 2012-1230

REVISED BY: GSA Engineering and Services  
DATE: 02/15/12

FIGURE 1





50 Kennedy Plaza, Suite 1500  
Providence, RI 02903-2319  
p: 401-274-2000 f: 401-277-9600  
hinckleyallen.com

**Robin L. Main**  
Direct Dial 401-457-5278  
rmain@hinckleyallen.com

May 22, 2013

***VIA HAND DELIVERY***

Ms. Anna Stetson, City Clerk  
Office of the City Clerk  
Providence City Hall  
25 Dorrance Street  
Providence, Rhode Island 02903

**RE: Petition for Easement on Public Street by The Narragansett Electric Company d/b/a National Grid**

Dear Ms. Stetson:

Please find enclosed an Amended Petition to the City Council for an Easement on Public Street for The Narragansett Electric Company d/b/a National Grid. This version should replace the earlier Amended Petition submitted on April 17, 2013. There are two changes to the Petition. First, this Amended Petition divides the easement request into one for a temporary easement for construction and then a permanent easement. The temporary easement is for a larger area than the permanent easement. A revised plan, which has already been submitted to the Department of Public Works, replaces the prior Exhibit A to illustrate the two areas. Second, the effective date is changed from May 15, 2013 to June 25, 2013. Please do not hesitate to contact me with any questions. Thank you.

Very truly yours,

A handwritten signature in black ink, appearing to read "Robin L. Main".

Robin L. Main

Enclosure

cc: Kenneth Lento, National Grid  
David Rusczyk, GZA  
Jillian Barker, Esq.

▶ ALBANY ▶ BOSTON ▶ CONCORD ▶ HARTFORD ▶ NEW YORK ▶ PROVIDENCE

#51626393 HINCKLEY, ALLEN & SNYDER LLP, ATTORNEYS AT LAW  
(57972/133068)

**CITY OF PROVIDENCE**  
STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

**PETITION TO THE CITY COUNCIL**

TO THE HONORABLE CITY COUNCIL OF THE CITY OF PROVIDENCE:  
*The undersigned respectfully petitions your honorable body*

*Amended May 22, 2013*

PETITION TO THE PROVIDENCE CITY COUNCIL  
FOR AN EASEMENT ON PUBLIC STREET, PROVIDENCE, RHODE ISLAND

WHEREAS, the undersigned, The Narragansett Electric Company d/b/a National Grid, is the owner of the following parcels of land: those certain parcels of real estate appearing on the Providence Assessor's Plat 46, Lots 481, 489, and 501 (the "National Grid Lots"). Those lots along with Plat 46, Lots 128 and 325, will be referred to herein as "170 Allens Avenue" or the "Site"; and

WHEREAS, 170 Allens Avenue is the site of a former manufactured gas plant and bulk petroleum storage and distribution terminal; and

WHEREAS, the Rhode Island Department of Environmental Management ("RIDEM") issued a September 3, 2009 *Letter of Non-Compliance* (Amended November 23, 2009) to National Grid and the other potentially responsible parties, including Cargill, Incorporated ("Cargill"), Dr. Patrick Conley and the Rhode Island State Pier Properties, related to contamination at the 170 Allens Avenue Site; and

WHEREAS, National Grid and Cargill responded to the RIDEM *Letter of Non-Compliance* by submitting to RIDEM a *Supplemental Site Investigation Data Report* (September 2010), a *Remedial Alternative Evaluation Report* (December 2010), a *Sediment Field Investigation Report* (July 2011), and a *Remedial Alternative Evaluation Report Addendum – Containment Wall Design* (December 2011), all in accordance with Rule 7.08 of the RIDEM *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* ("Remediation Regulations"); and

WHEREAS, RIDEM issued a publicly-noticed *Program Letter* in February 2012 indicating that the investigation was complete; and

WHEREAS, RIDEM, in accordance with Rule 7.09 of the Remediation Regulations, issued a *Remedial Decision Letter* on July 6, 2012, that formally approved the Site investigation and identified the preferred remedial approach for the Site; and

WHEREAS, the approved preferred remedial approach identified by RIDEM includes containment of non-aqueous phase liquids (NAPL) via installation of a continuous stone collection trench equipped with a partially penetrating liner

downgradient of Lots 325 and 489, and requires the integration of stormwater management systems as depicted on the plans included in Exhibit A; and

WHEREAS, National Grid and Cargill, in accordance with Rule 9.00 of the Remediation Regulations, submitted a Remedial Action Workplan to RIDEM on December 3, 2012;

WHEREAS, Lots 325 and 489 are divided by the eastern end of Public Street, a public way located on land owned by the City of Providence; and

WHEREAS, the approved preferred remedial approach identified by RIDEM requires the installation of a below-grade stone collection trench across the eastern end of Public Street between Lots 325 and 489 in an area twenty-six (26) feet across and three (3) feet wide; and

WHEREAS, the preferred remedial approach identified by RIDEM also requires the installation of two (2) 60-inch diameter concrete manholes and associated stormwater piping within the eastern end of Public Street between Lots 325 and 489 as part of the stormwater management system integration; and

WHEREAS, National Grid will require temporary access to an area of Public Street measuring approximately 26-feet wide and 120-feet long for a period of approximately three weeks to complete installation; and

WHEREAS, National Grid will require the ability to maintain, monitor and repair the stone collection trench, manholes, below grade piping and monitoring wells at the eastern end of Public Street (the "Public Street Area") following installation;

NOW, THEREFORE, the undersigned respectively petitions this Honorable City Council to take all steps necessary and appropriate to grant a perpetual easement, effective on or before June 25, 2013, to National Grid to comply with the approved preferred remedial approach identified by RIDEM at the 170 Allens Avenue Site on the sections of Public Street Area indicated on Exhibit A. Specifically, National Grid requests:

- (1) a temporary construction easement for the hatched area covering 3,011.86 square feet as identified in Exhibit A for purposes of installing a stone collection trench, two (2) concrete manholes, and below grade piping and groundwater monitoring wells consistent with the plans shown in Exhibit A;
- (2) a perpetual easement for the shaded area covering 305.53 square feet as identified in Exhibit A for purposes of monitoring, maintaining and repairing as necessary a stone collection trench, two (2) concrete manholes, and below grade piping and groundwater monitoring wells consistent with the plans shown in Exhibit A.

Pursuant to this easement, National Grid shall have the right to install, maintain, repair, and replace the improvements indicated in Exhibit A. Further, the City, as landowner, shall grant National Grid the authority to apply for all necessary permits and approvals required to accomplish the same.

Any questions regarding this Petition may be addressed to:

Robin L. Main, Esquire  
Hinckley, Allen & Snyder LLP  
50 Kennedy Plaza, Suite 1500  
Providence, RI 02903  
401-274-2000

Kenneth E. Lentó, P.E., LSP  
Project Manager  
Site Investigation & Remediation Group - New England  
National Grid  
40 Sylvan Road  
Waltham, MA 02451  
617-791-2627

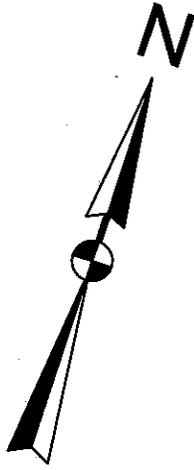
THE NARRAGANSETT ELECTRIC  
COMPANY d/b/a NATIONAL GRID

Name: Robin L. Main

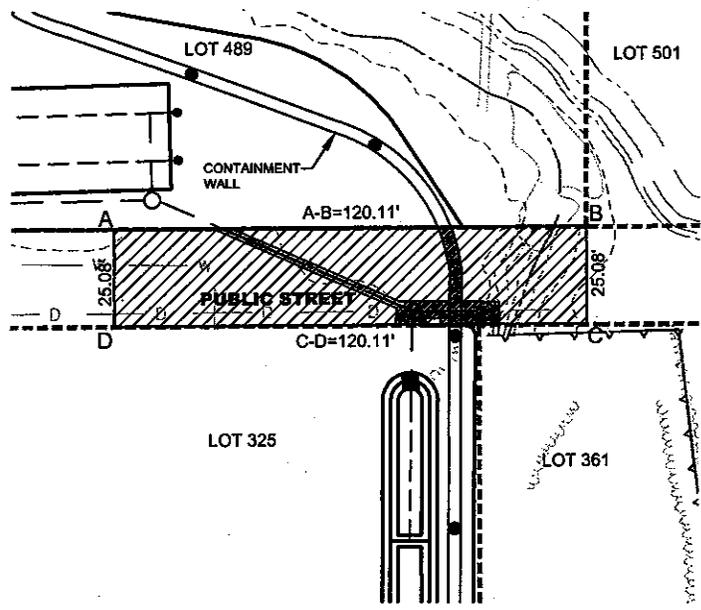
Title: Partner

#51624929 (57972/133068)

**EXHIBIT A**



PROVIDENCE, R.I.  
 P. W. DEPT. ENGINEERING OFFICE  
**STREET LINE SECTION**  
 Plan No. 064843  
 Date April 9, 2013



Notes: Hatched area (A-B-C-D-A) delineates the *temporary construction work area*; total square footage = 3,011.86  
 Gray shaded area indicates *proposed easement*; total square footage = 305.53

\\GZAPROV\jobs\EM\33576.00\plan\FIGURES\GZA\_DWG\CAPPING\B.5x13\_MTLAR.dwg May 16, 2013-3:45pm

CITY OF PROVIDENCE, R.I.  
 Public Works Dept. Engineering Office  
 Showing Proposed easement for Public  
Street  
 Drawn by M. Strubel Checked by \_\_\_\_\_  
 Scale 1"=40' Date 4-9-2013  
 Correct \_\_\_\_\_ Associate Engr.  
 Approved \_\_\_\_\_  
 CHEIF ENGINEER

Lot numbers taken from A.P. 46

768  
Q-60



**REMEDIAL ACTION WORK PLAN  
170 ALLENS AVENUE  
PROVIDENCE, RHODE ISLAND**

**PREPARED FOR:**  
RIDEM  
Providence, Rhode Island

**PREPARED BY:**  
GZA GeoEnvironmental, Inc.  
Providence, Rhode Island

December 2012  
File No. 33576.00

Copyright© 2012 GZA GeoEnvironmental, Inc.

---

GZA  
GeoEnvironmental, Inc.

Engineers and  
Scientists

December 3, 2012  
File No. 03.0033576.20-C

Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: *Remedial Action Work Plan*  
170 Allens Avenue, Providence, Rhode Island  
Plat 46, Lots 128, 325, 481, 489, and 501  
RIDEM Case No. 98-042 (including 98-042a & 98-042b)

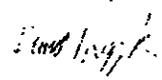
Dear Mr. Martella:

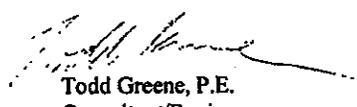
GZA GeoEnvironmental, Inc. (GZA) has prepared the enclosed *Remedial Action Workplan (RAWP)* for the property located at 170 Allens Avenue in Providence, Rhode Island (the Site) in response to the July 6, 2012 Remedial Decision Letter (RDL) issued by the Rhode Island Department of Environment Management (RIDEM). The RDL formally approved the Site investigation and identified the preferred remedial approach for the Site. In addition, the RDL required the development and submittal of a *RAWP*, a draft Environmental Land Use Restriction (ELUR) and a Soil Management Plan (SMP) within 90-days of the date of the RDL (October 4, 2012). RIDEM approved National Grid's requests for extensions of the *RAWP* submittal date to December 3, 2012. The enclosed *RAWP* was prepared consistent with the requirements of Rule 9.00 of the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations), updated November 2011 and includes a draft ELUR and SMP. The remedy described in this *RAWP* will be implemented following receipt of a Remedial Action Approval from RIDEM.

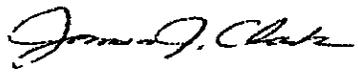
We look forward to continue to work cooperatively with RIDEM to advance this Site to compliance with the applicable regulations. Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Mr. Kenneth Lento at 617-791-2627.

Very truly yours,

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## 1.00 INTRODUCTION



GZA GeoEnvironmental Inc. (GZA) has prepared this *Remedial Action Work Plan (RAWP)* for the property located at 170 Allens Avenue in Providence, Rhode Island (the Site). The Site is further defined as the land based portions of property identified on the Providence Tax Assessors Plat Maps as Plat 46 Lots 128, 325, 481, 489, and 501. A Site Locus Plan is provided on the cover page to the Design Figures included in Appendix B. **Figure 1** depicts the lot designations and locations. The objective of this *RAWP* is to address the requirements of Rule 9.00 of the Rhode Island Department of Environmental Management (RIDEM) Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases (Remediation Regulations) promulgated August 4, 1996 and most recently amended in November 2011.

RIDEM issued a September 3, 2009 *Letter of Non-Compliance, LONC* (Amended on November 23, 2009) to Cargill Incorporated, National Grid, and Rhode Island State Pier Properties, LLC (RISPP). In response to the *LONC*, GZA submitted to RIDEM a September 2010 *Supplemental Site Investigation Data Report (SSIDR)*, a December 2010 *Remedial Alternative Evaluation Report*, a July 2011 *Sediment Field Investigation Report*, and a December 2011 *Remedial Alternative Evaluation Report Addendum – Containment Wall Design*. These documents, along with various other submittals fulfilled the requirements of the *Site Investigation Report (SIR)* as described in Rule 7.08 of the *Remediation Regulations*. RIDEM subsequently issued a *Program Letter* dated February 24, 2012 deeming the Site investigation complete. In accordance with Rules 7.07 and 7.09 of the *Remediation Regulations*, public notice of the preferred remedial alternative was performed on March 9, 2012 and the public comment period was completed on March 23, 2012. One comment was received and a response was issued by RIDEM on June 25, 2012. RIDEM subsequently issued a July 6, 2012 *Remedial Decision Letter (RDL)* which formally approved the Site investigation, identified the preferred remedial approach for the Site, and authorized the development of a *RAWP*. As described in the *RDL* and consistent with the *Remedial Alternative Evaluation Report*, the preferred remedial alternative consists of the following:

- Encapsulation of contaminated soils via the installation of a permeable, minimum one foot thick, engineered cap with an underlying marker layer;
- Physical containment of non-aqueous phase liquid (NAPL) impacts via installation of a partially penetrating wall/stone collection trench along the downgradient boundary of Lot 325 and just upgradient of the cove area shoreline along Lots 489 and 501;
- Focused NAPL recovery from a network of wells;
- Periodic long term groundwater natural attenuation monitoring;
- Implementation of an Environmental Land Usage Restriction (ELUR) on the Site that restricts certain activities and uses and ensures the engineered cap is not disturbed. In addition, the ELUR will require that potential volatilization issues are addressed for future buildings constructed in areas exhibiting exceedances of GB Groundwater Objectives. The ELUR will include a post-construction Soil

Management Plan (SMP) which will outline procedures for managing materials should disturbances below the engineered cap be required. As required by the RDL, a draft ELUR and the SMP are included as appendices to this RAWP; and,

- Annual engineered cap and containment wall inspections and maintenance.

This RAWP is organized as follows:

- Section 1.00 contains this introduction;
- Section 2.00 contains a Site description and a summary of Site history;
- Sections 3.00 through 19.00 provide the information required by Rules 9.02 through 9.18 of the *Remediation Regulations*; and,
- Section 20.00 contains the Certification per Section 9.19 of the *Remediation Regulations*.

This RAWP is subject to the Limitations included in Appendix A.

## 2.00 BACKGROUND

The following provides a Site description and a summary of relevant past Site operations. For further details, please refer to the September 2010 *SSIDR* and/or the December 2010 *Remedial Alternative Evaluation Report*.

### 2.10 SITE LOCATION AND DESCRIPTION

The Site consists of approximately 5.6 acres of land across five lots (i.e., Lots 128, 325, 481, 489, and 501). In previous submittals to RIDEM, the Site was identified as consisting of only Lots 128, 325, 481, and 489, however, during survey work conducted in early 2012, part of the property boundary between Lot 489 and Lot 501 was determined to be further to the west than the mean high water line. Note: that Lot 501 was previously believed to be a water only lot. As such, a portion of Lot 501 is within the land previously identified as the Site and included as part of the Site in this report.

The Site is abutted by Allens Avenue to the west, an active petroleum storage terminal to the north, the Providence River to the east, and commercial and industrial properties to the south. The Site is currently zoned by the City of Providence as W-3 (port maritime industrial district) and the Site vicinity is characterized as urban, heavily developed waterfront property. With the exception of two buildings located on the northwestern portion of Lot 481 and a limited amount of bituminous concrete near these buildings and along the eastern portion of the Site, gravel is located at the ground surface on the Site. Concrete foundations and retaining walls associated with former Site operations are present above existing surface grade in the eastern portion of Lot 325. Other notable Site features include a steel bulkhead wall between the land portion of Lot 481 and the river, a wharf that extends into the river from Lot 481, and a cove area present on Lots 489 and 501. The shoreline of the cove area consists of a stone rip-rapped slope. A below grade,





partially penetrating slurry wall is present approximately 15 to 20 feet west of the shoreline of this cove area. The slurry wall was installed to mitigate the potential migration of observed light non-aqueous phase liquids to the Providence River. Identified below grade Site utilities include electric, water, and sanitary sewer. A municipal storm water drainage line that discharges to the Providence River is present within Public Street to the south of Lot 489. This drainage line is owned by the Narragansett Bay Commission (NBC) and, based on our conversations with NBC, is capped within Allens Avenue.

A Site *Locus Plan* is included on the cover page to the Design Figures included in Appendix B. Existing Site conditions and key features are shown on **Figure 1** included in Appendix B.

## 2.20 SITE HISTORY AND OWNERSHIP

Prior to 1875, the current land based portions of the Site area was beneath the Providence River. Sometime between 1875 and 1882, Lot 489 was created by the progressive filling of the riverfront. Portions of a Manufactured Gas Plant (MGP) were constructed and operated on Lot 489 between 1875 and 1916 (41 years). From approximately the 1920s to 2000 (+/-80 years), with the exception of Lot 128, the predominant use of the Site was as a bulk petroleum storage and distribution terminal. Bulk petroleum tanks were formerly located on Lots 325, 481, and 489. Lot 128 was formerly used for aluminum and wire packing case manufacturing. The majority of the Site was subsequently redeveloped into its current state and used primarily as a graveled parking lot by RISPP between 2004 and 2006. These redevelopment activities included the placement of approximately 4 to 7 feet of fill in the location of the former bulk petroleum aboveground storage tanks on Lot 481.

Currently, Lot 128 is owned by Cargill Incorporated; Lot 325 is owned by Ms. Gail Conley; and Lots 481, 489, and 501 are owned by The Narragansett Electric Company d/b/a National Grid (National Grid).

## 2.30 ENVIRONMENTAL SETTING

The Site is located at an elevation of approximately 8 to 13 feet above mean sea level (MSL) and slopes to the east towards the Providence River. The Site is within the FEMA Flood zones V18 (Elevation 20, 1929 NGVD) and A12 (Elevation 16, 1929 NGVD). The river adjacent to the Site is classified by RIDEM and the Coastal Resources Management Council (CRMC) as Type 6 waters, Industrial Waterfronts and Commercial Navigation Channels and has a surface water classification of SB1{a}. According to RIDEM's Water Quality Regulations Amended on December 2010, the SB1 water classification is assigned to saline waters designated for primary and secondary contact recreational activities and wildlife habitat; suitable for aquacultural uses, navigation and industrial cooling; and good aesthetic value. The designation also assumes that primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. The "{a}" indicates that it is a partial use designation due to impacts from Combined Sewer Outfalls



(CSOs) and therefore “primary contact recreational activities, shell fishing, and fish and wildlife habitats will likely be restricted”. These restrictions would be consistent with the industrial nature and uses in the vicinity of the Site.

Site stratigraphy generally consists of fill materials, underlain by a discontinuous layer of sorted sand (identified as the Upper Sand Layer), underlain by marine silt (identified as the Upper Silt Layer), underlain by stratified fine to coarse sands with interbedded silt layers (identified as the Lower Sand Layer), underlain by a second silt layer (identified as the Lower Silt Layer). The thickness of the fill materials were observed to be highly variable, ranging from approximately 2 to 28 feet. Consistent with the development history, the western portion of the Site contains less fill than the eastern portion of the Site adjacent to the river. In general, the fill consists of sands mixed with varying percentages of relatively inert materials such as ash, slag, coal, shells, brick, concrete, and wood. Evidence of former structures (e.g., brick walls and concrete) and buried piping (presumably abandoned) were also observed within the fill materials. The Upper Sand Layer generally consists of relatively permeable sorted sands and varies in thickness where the layer was encountered with observed thicknesses in localized areas up to approximately 20 feet. The Upper Sand Layer was not continuous across the Site and was predominantly observed across Lot 481 and the western side of Lot 489. The Upper Silt Layer appears to be continuous across the Site and ranges in thickness from approximately 2.5 feet (observed within the northwestern corner of the Site) to 30 feet. The top of the Upper Silt Layer dips to the east across the Site and continues beneath the river. The relatively low hydraulic conductivity of this unit was estimated to be approximately  $1.6E10^{-7}$  to  $2.7E10^{-7}$  centimeters /second (0.0004 to 0.0008 feet per day). Given this low conductivity, the Upper Silt Layer is expected to inhibit downward migration of contaminants. The Lower Sand Unit generally consists of stratified fine to coarse sands interbedded with silt layers and was observed to range in thickness from approximately 13 to 36 feet. The Lower Silt Unit predominantly consists of silt with varying amounts of sand and is considered relatively impermeable. This Lower Silt Unit is encountered approximately 28 feet below the Upper Silt Unit in the vicinity of the Providence River and cove area. The thickness of the Lower Silt Layer is not known; however in the western portion of Lot 489, it is at least approximately 19 to 20 feet thick.

Groundwater in the area of the Site is classified by RIDEM as a GB Groundwater Resource, and is therefore not considered suitable for potable use. Groundwater was encountered at depths of approximately 4 to 9 feet below ground surface (bgs) across the Site and is inferred to flow to the east towards the Providence River. Because of anthropogenic effects of the fill and manmade structures (the bulkhead walls and the slurry wall adjacent to the cove), groundwater flow to the Providence River is likely not uniform across the eastern edge of the Site.

### 3.00 REMEDIAL OBJECTIVES (RULE 9.02)



The overall remedial objective for the Site is to protect human health and the environment relative to the identified impacts. Consistent with Rule 9.02 of the *Remediation Regulations*, the following sections outline specific remedial objectives for Site soil, groundwater, and air based on the nature and extent of the observed impacts and our understanding of current and foreseeable future Site use. As described further herein, certain aspects of the remedy serve to mitigate further potential impacts to surface water and sediment.

#### 3.10 GROUNDWATER OBJECTIVES

Two aquifers (upper and lower) are present beneath the Site. The upper aquifer consists of materials (fill and Upper Sand Layer) located above the Upper Silt Layer and is inferred to discharge to the Providence River. The lower aquifer consists of the Lower Sand Layer and is "confined" between the Upper and Lower Silt Layers. Site groundwater impacts include both observations of NAPL as well as dissolved phase constituents. These impacts and their respective remedial objectives are described below.

##### 3.10.1 Non-Aqueous Phase Liquids

Figures 6A, 6B, and 6C, which were provided to RIDEM in April 2011 and are included in Appendix C, depict recent observations of LNAPL and DNAPL, respectively, at the Site. As indicated on these figures, NAPL measurements are sporadic across the Site. LNAPL impacts have been observed in the upper aquifer on Lots 325 and 489 at thicknesses ranging from trace amounts to approximately 3.3 feet (MW-2 in October 2010). LNAPL has not been observed in the lower aquifer. DNAPL has been observed within the upper aquifer on Lots 325 and 489 (for consistency to past documentation, the reference to Lot 489 in the subsequent sections of this report with regards to nature and extent of compounds at the Site also includes the portion of Lot 501 that was previously included within Lot 489) at thicknesses ranging from trace amounts to approximately 5.6 feet (MW-531 in October 2010). DNAPLs were also observed within the lower aquifer on Lot 489 at thickness ranging from trace amounts to approximately 12 feet at one location (MW-605D in January 2012). Due to the physical properties of the observed DNAPLs, they tend to be generally stable and immobile in the environment. These types of DNAPL however tend to sink vertically through more permeable deposits such as those within the upper aquifer due to density driven forces and accumulate on lower permeable deposits such as the Upper and Lower Silt Layers. Given its low permeability, the Upper Silt Layer would be expected to mitigate the vertical migration of DNAPL. Since DNAPL is observed below the Upper Silt Layer some localized migration through the silt or more likely vertical migration promoted by foundation elements of former Site structures has occurred. The Upper Silt Layer is expected to extend eastward beneath the Providence River and preferential vertical migration pathways through the Upper Silt Layer are not likely to be present to the east of the Site.



Given its physical properties, the observed DNAPL detected within the lower aquifer are not expected to migrate laterally significant distances and are likely "confined" between the Upper and Lower Silt Layers.

While potential migration of both LNAPL and DNAPL is expected to be limited at this Site due to physical properties and Site hydrogeologic conditions, consistent with Rule 8.07, the presence of NAPL represents an Upper Concentration Limit (UCL) exceedance. The remedial objectives related to Site groundwater impacts includes containment and to the extent practical, removal of observed NAPL.

### 3.10.2 Dissolved Phase Groundwater Objectives

Figure 15 from the September *SSIDR*, which is attached in Appendix C, depicts the distribution of dissolved phase benzene, toluene, ethylbenzene, and naphthalene from the most recent groundwater sampling rounds which were performed in December 2009 and June 2010. The most significant groundwater impacts in terms of dissolved phase constituents have been detected on Lots 325, 489, and 501 generally coincident with the observed distribution of NAPL. On these two lots, benzene has been detected at concentrations above the GB Groundwater Objective and naphthalene has been detected above the calculated Method 2 GB Groundwater Objective within the upper aquifer. More elevated dissolved phase groundwater impacts have been observed within the lower aquifer on Lot 489, coincident with the observations of DNAPL. These dissolved phase volatile impacts include the detection of benzene at 30,000 and 32,000  $\mu\text{g/L}$  and toluene at 24,000 and 32,000  $\mu\text{g/L}$  at two locations (MW-427D and MW-603D) which exceed the UCL and GB Groundwater Objectives. Ethylbenzene has also been detected above the GB Groundwater Objective and naphthalene above the Method 2 GB Groundwater Objective within the lower aquifer.

The two potential pathways/routes of exposure for dissolved phase groundwater impacts at this Site are migration towards the Providence River and potential volatilization. With respect to the former, potential impacts from the Site to surface water and sediments of the Providence River via dissolved phase groundwater migration are not considered significant. Using hydraulic gradients and conductivities from field data and average saturated thicknesses for each unit, the groundwater flux across the Site for each aquifer was calculated using Darcy's Law:

Flow System	Flow Width (ft)	Flow Thickness (ft)	Hydraulic Conductivity (ft/day)	Hydraulic Gradient (ft/ft)	Flow (ft <sup>3</sup> /day)	Flow (GPM)
Upper Aquifer	1,000	15	25.1	0.005	1,880	9.8
Lower Aquifer	1,000	25	1.8	0.006	270	1.4

This resulted in conservative estimates for the groundwater flow through the upper and lower aquifers of approximately 9.8 gallons per minute (gpm) and 1.4 gpm, respectively. These relatively low groundwater flux rates combined with observed



dissolved phase impacts are unlikely to result in significant degradation of sediment and surface water quality adjacent to the Site. As indicated previously, the surface water adjacent to the Site is classified by RIDEM and CRMC as Type 6 waters, Industrial Waterfronts and Commercial Navigation Channels and has a surface water classification of SB1{a}. According to RIDEM's Water Quality Regulations Amended on December 2010, this water classification indicates that primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges and that it is a partial use designation due to impacts from Combined Sewer Outfalls (CSOs) and therefore "primary contact recreational activities, shell fishing, and fish and wildlife habitats will likely be restricted". Based on this evaluation, no specific objective related to dissolved phase groundwater migration towards the Providence River is recommended. The objectives related to NAPL described above (containment and to the extent practical removal) combined with natural attenuation mechanisms will serve to improve dissolved phase groundwater quality over the long term.

As described in Section 8.03 of the *Remediation Regulations*, GB Groundwater Objectives are based on the potential for volatile organic compounds (VOCs) to volatilize from the groundwater into indoor air. As indicated above and shown on Figure 15 in Appendix C, elevated dissolved phase VOC impacts have been primarily observed within the upper and lower aquifers on Lots 325 and 489. There currently exist no buildings or other structures on these portions of the Site. As indicated previously, current Site structures are limited to two small, currently unoccupied buildings on the northwestern portion of Lot 481<sup>1</sup>. The remedial objectives for groundwater include addressing potential volatilization issues associated with future building construction at this Site.

### 3.20 SOIL OBJECTIVES

Total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAHs) were detected within surface soils (upper 2-feet) in certain portions of the Site at concentrations above the Method 1 Industrial/Commercial Direct Exposure Criteria (I/C-DEC) and GB Leachability Criteria (TPH only). These surface impacts were primarily identified on Lots 128, 325, and 489; however, localized exceedances were also detected on Lot 481. Metals (primarily arsenic, lead and/or beryllium) were also sporadically detected within surface soils at concentrations exceeding the Method 1 I/C-DEC.

Subsurface soil (greater than 2 feet below ground surface) impacts exhibited similar characteristics as surface soils (*i.e.*, TPH, metals, and PAHs above the Method 1 I/C-DEC) but, in general, at higher concentrations. In addition, VOCs, primarily benzene, toluene, and ethylbenzene, were also detected in certain subsurface soils on Lots 325 and 489 and in localized areas of Lot 128 at concentrations exceeding the GB Leachability Criteria. UCL exceedances for TPH were also noted primarily within Lots 325 and 489 and localized areas of Lots 128 and 481 (one location along the southern edges of each lot).

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<sup>1</sup> As described in Section 11.10, the southernmost building on Lot 481 will be razed as part of the construction of the engineered cap.



The current and foreseeable future use of the Site is consistent with its current zoning (maritime industrial) and the surrounding property uses. Given these conditions and the extent of observed soil impacts at the Site, the remedial objective for soils consists of mitigation of future human exposure to soils impacted with contaminants at concentrations above the Method 1 I/C-DEC.

### 3.30 AIR OBJECTIVES

Impacts to air quality at this Site are limited to potential indoor air quality impacts associated with volatilization. As described in Section 3.10.2, current buildings are limited to two small, unoccupied structures on the northwestern portion of Lot 481 (see footnote above) and the remedial objectives associated with groundwater include addressing potential volatilization issues associated with future building construction.

### 3.40 REMEDIAL OBJECTIVES SUMMARY

In summary, the identified remedial objectives for the Site are:

- containment and to the extent practical, removal of observed NAPL;
- long term groundwater quality improvement via natural attenuation;
- addressing potential volatilization issues associated with future building construction; and
- mitigation of future human exposure to soils impacted with contaminants at concentrations above the Method 1 I/C-DEC.

## **4.00 PROPOSED REMEDY (RULE 9.03)**

This section explains how the proposed remedy meets the remedial objectives listed in Section 3.40. Although not a specific remedial objective, this section also includes a discussion on stormwater run-off management techniques that will be integrated into the remedial design as required in Rule 9.03D of the *Remediation Regulations*. Details on the design of the remedy and the stormwater run-off management techniques are outlined in Section 11.00 and the figures included in Appendix B.

### 4.10 CONTAINMENT AND RECOVERY OF NAPL

As indicated above, LNAPL and DNAPL have been sporadically observed in the upper aquifer in certain portions of Lots 325, 489, and 501. Potential migration of NAPL to the adjacent Providence River is expected to be limited due to physical properties of the NAPL, Site hydrogeologic conditions, the limited thicknesses of observed NAPL and by the containment of the observed NAPL impacts within the upper aquifer on Site. Containment will be accomplished via installation of a stone collection trench on the downgradient (eastern) edge of Lot 325 and along the shoreline of Lots 489 and 501. The trench will extend at least 4 feet into the Upper Silt Layer and be designed to intercept the full saturated



thickness associated with the upper aquifer. The Upper Silt Layer is approximately 14 to 20 feet thick along the alignment of the collection trench. The trench will be equipped with a liner on the downgradient side of the trench that spans the groundwater table to mitigate migration of LNAPL. Due to the differences in permeability of the stone within the trench and existing Site soils and its general immobility, the DNAPL within the upper aquifer is expected to preferentially collect within the trench. The trench will be equipped with shallow and deep recovery wells to allow the extraction of NAPL collected within the trench. The shallow wells will span the groundwater table and will be used to recover LNAPL and the deep wells will be screened at the interface with the Upper Silt Layer to allow of the collection of DNAPL. DNAPL is also present within the lower aquifer; however, these deep DNAPL impacts are not expected to migrate laterally significant distances and are likely confined between the Upper and Lower Silt Layers.

Containment of the observed NAPL impacts will be supplemented with long term manual recovery and off-Site disposal of the observed NAPL within both the lower and upper aquifers via the existing network of Site monitoring wells. In addition to the existing network, three wells will be installed along the southern property boundary of Lot 325 to facilitate monitoring and manual recovery of LNAPL in this area of the Site. These additional wells are designed to address recent observations of a limited area of LNAPL in an excavation located on the northeastern portion of adjacent Lot 361. Periodic monitoring and manual recovery of observed LNAPL via these wells is considered adequate given that the currently observed LNAPL thicknesses along the southern portion of Lot 325 are limited (less than 0.1 feet) and therefore unlikely to migrate.

An Environmental Land Usage Restriction (ELUR) will be placed on the Site that ensures the stone collection trench is not disturbed and that it is inspected annually and repaired (as necessary).

#### 4.20 GROUNDWATER IMPACTS

Certain dissolved phase VOCs were detected within the upper and lower aquifers on portions of the Site at concentrations in excess of the GB Groundwater Objectives. As described in Section 3.10.2, GB Groundwater Objectives are based on the potential for VOCs to volatilize from the groundwater into indoor air. There are no current structures within these areas of the Site. In order to mitigate potential exposures of future Site occupants or owners to impacted soil vapors, an ELUR will be placed on the Site that requires volatilization issues be addressed for future Site buildings constructed in areas exhibiting exceedances of GB Groundwater Objectives.

Natural attenuation combined with containment and removal of NAPL to the extent practical will result in improved Site groundwater quality in the long term. Site groundwater quality will be routinely monitored as described in Section 11.40.



#### 4.30 MITIGATION OF FUTURE HUMAN EXPOSURE TO IMPACTED SOILS

Surface (less than 2 feet below grade) and deeper soil impacts were detected at the Site at concentrations above the Method 1 I/C-DEC. In order to mitigate the potential for direct human contact to these impacted materials, a one foot thick, engineered soil cap will be installed across the entire Site. The cap will be constructed with imported fill that is compliant with the Method 1 Residential Direct Exposure Criteria and will be equipped with an underlying high visibility geotextile that acts as a warning barrier.

The cap will be supplemented with an ELUR on the Site that ensures the engineered cap is not disturbed and that the cap is inspected annually and repaired (as necessary). The ELUR will also include a Soils Management Plan (SMP) that establishes the procedures and provisions should future construction/maintenance activities at the Site require the need to disturb soils beneath the engineered cap.

#### 4.40 STORMWATER RUN-OFF MANAGEMENT

In order to meet the requirements of the RIDEM December 2010 *Rhode Island Stormwater Design and Installation Standards Manual*, certain prescribed stormwater quality treatment systems were integrated into the remedial design. These stormwater quality treatment systems have been specified to meet the requirements of the CRMC Special Area Management Plan (SAMP) associated with the adjacent coastal waters. The stormwater quality treatment systems will be installed on the downgradient (east) edges of the Site to reduce the amount of pollutants discharged to the Providence River. The stormwater quality treatment systems for Lots 128, 481, 489, and 501 will consist of concrete forebays to remove sediment and pretreat the stormwater runoff prior to discharging to sand filters. The sand filters will discharge to the Providence River. The stormwater quality treatment system for Lot 325 will consist of a lined grass swale forebay that will discharge to a lined sand filter unit prior to discharge to the Providence River.

### **5.00 REMEDIATION OF IMPACTED GROUNDWATER (RULE 9.04)**

As described in Section 3.10, the remedial objectives for Site groundwater include containment and to the extent practical removal of observed NAPL, natural attenuation, and addressing potential volatilization issues associated with future building construction. These Site specific objectives were identified in light of the relatively low groundwater flux through the Site and the resultant limited potential impact to the adjacent Providence River and the sporadic observation of relatively immobile NAPL across the Site. While the presence of NAPL results in certain areas of elevated dissolved phase VOC and PAH groundwater concentrations, this impacted groundwater is not likely to contribute significantly to the degradation of surface water and sediment quality adjacent to the Site. In addition, currently there are no structures located on the Site where dissolved phase groundwater impacts and the potential for volatilization are most significant.

The requirement to address potential volatilization issues associated with future building construction will be accomplished via the ELUR (see draft in Appendix D). In addition, NAPL containment via the collection trench, manual NAPL removal from the Site monitoring well network, and natural attenuation will serve to improve groundwater quality over the longer term.



## 6.00 LIMITED DESIGN INVESTIGATIONS (RULE 9.05)

This section summarizes the results of certain limited Site investigations that were performed to facilitate the design of the RIDEM approved remedy.

### 6.10 GRAVEL TESTING

In March 2012, GZA performed twelve shallow borings (GS-1 through GS-12) to evaluate whether the existing gravel present on the surface of the Site could be re-used as clean fill for the engineered cap. Four borings (GS-1 through GS-4) were performed on Lot 481; three (GS-5 through GS-7) were performed on Lot 128; three (GS-8 through GS-10) were performed on Lot 489; and two (GS-11 and GS-12) were performed on Lot 325. Boring locations are depicted on **Figure 3**. The borings were performed via augering through the layer of gravel until the underlying sandy fill materials were encountered. Gravel samples were then collected from the top three inches of the sidewalls of each borehole and the borehole backfilled with the original material. The gravel sample from each boring was subsequently analyzed for the thirteen priority pollutant metals (PPM-13 metals), VOCs, pesticides, polychlorinated biphenyls (PCBs), TPH, cyanide, and semi-volatile organic compounds (SVOCs) by ESS Laboratory of Cranston, RI. The laboratory data report is attached in Appendix E and the analytical results are summarized in Table 1.

As indicated in Table 1, TPH was detected in 11 of the 12 gravel samples at concentrations ranging from 465 mg/kg to 18,600 mg/kg, which exceed the Method 1 Residential Direct Exposure Criteria (R-DEC) of 500 mg/kg. The detected TPH concentrations in one of the samples also exceeded the Method 1 Industrial/Commercial Direct Exposure Criteria (I/C-DEC) of 2,500 mg/kg. Benzo(a)pyrene was also detected in 11 of the 12 samples at concentrations ranging from 1.29 mg/kg to 14.7 mg/kg and above the Method 1 R-DEC and I/C-DEC. Benzo(a)anthracene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were also detected in certain samples at concentrations above the Method 1 R-DEC and I/C-DEC. Lead was detected in one sample at a concentration of 341 mg/kg, which exceeds the Method 1 R-DEC of 150 mg/kg. The remaining detected concentrations of metals, VOCs, and cyanide were below the Method 1 R-DEC. PCBs and pesticides were not detected above the laboratory's reporting limit.

Based on these analytical results, the existing surface gravel material was determined to be unsuitable for use as part of the engineered cap. These materials will be re-graded and placed below imported clean fill used to construct the cap.



## 6.20 CONTAINMENT WALL ALIGNMENT BORINGS

In March 2012, GZA performed ten borings (W-1 through W-10) along the alignment of the proposed stone collection trench to evaluate the presence of potential below grade obstructions (*e.g.*, wood piers, concrete foundations, *etc.*) that could impede the installation/construction of the trench and collect additional subsurface strata data, including the depth of the contact between the Upper Silt Layer and the Fill/Upper Sand Layers. Boring locations are depicted on **Figure 3**.

These borings were performed via hollow stem auger drilling techniques and extended into the Upper Silt Layer. During the advancement of the borings, soil samples were collected continuously and classified using the modified Burmiester Soil Classification System, field screened for presence of VOCs with a photo-ionization detector (PID), and evaluated for the presence of environmental indicators (staining and odors). Boring logs documenting subsurface conditions encountered are included in Appendix F.

Boring explorations ranged in depth from approximately 15 to 28 feet below grade. Consistent with previous observations at the Site, subsurface materials consisted of fill, overlying a discontinuous layer of sand overlying silt. The top of the Upper Silt Layer was encountered at depths ranging from 14 feet to 27.5 feet below grade and was encountered at greater depths on the north side of Lot 489 and Lot 501. Two large pieces of wood debris were observed at borings W-2 (2.3 to 4.5 feet below grade) and W-5 (14 to 16 feet below grade). This debris is not expected to impede construction of the stone collection trench.

Upon completion, each boring was grouted to mitigate the potential vertical migration of contaminants. Drill spoils generated during the course of the work were containerized in 55-gallon drums and subsequently disposed off-Site. In total, 4 drums of drill spoils were disposed off-Site.

## 6.30 TEST PIT EXPLORATIONS

On September 20, 2012, GZA performed eight shallow test pit explorations (TP-11 through TP-12) on Lots 481, 489, and 501. The objective of these test pits were to further evaluate the layout of the existing containment wall on Lots 489 and 501, to evaluate the presence, depth, and size of certain existing utilities, and to evaluate the foundation of the bulkhead wall on the east side of Lot 481. Test pits ranged in depth from approximately 2.5 to 7 feet below grade. Test pit locations are depicted on **Figure 2** and logs for these explorations are included in Appendix J.

In addition, on November 1, 2012, five additional test pits (TP-20 through TP-24) were performed on Lot 325 to evaluate: two identified below grade pipes; the foundation system associated with the retaining wall separating Lots 325 and 361; and the presence of LNAPL along the southern edge of Lot 325. Test pit locations are depicted on **Figure 2** and logs for these explorations are included in Appendix J. These test pits indicated the following:



- The two identified below grade pipes only extend approximately 2 feet into Lot 325 and are cut below grade;
- The foundation system for the western half of the retaining wall on the south side of Lot 325 is approximately 3 to 4 feet below current grade and includes an approximately one foot thick, 6 foot wide footing;
- The foundation system for the eastern half of the retaining wall on the south side of Lot 325 appears to be approximately 3 feet below current grade and includes an approximately 5 foot wide footing. In addition, concrete bracing (supports) extend from the footing to the above grade portions of the retaining wall; and,
- Petroleum impacts were observed on top of the shallow groundwater table but consistent with recent observations in the monitoring well network on Lot 325 were limited to sheens.

At each location, the surface gravel was removed and segregated from subsurface soils. The excavated material from each test pit was then temporarily stockpiled on top of polyethylene sheeting adjacent to each excavation. Upon completion of the test pit and documentation of subsurface materials encountered, the original excavated material was used to backfill each test pit in compacted lifts and the gravel replaced at the surface.

#### **7.00 POINTS OF COMPLIANCE (RULE 9.06)**

The following remedial objectives for this Site were identified in Section 3.40:

- containment and to the extent practical, removal of observed NAPL;
- long term groundwater quality improvement via natural attenuation;
- addressing potential volatilization issues associated with future building construction; and
- mitigation of future human exposure to soils impacted with contaminants at concentrations above the Method 1 I/C-DEC.

Based on these remedial objectives, points of compliance to determine whether these remedial objectives are, or are being achieved will include:

- Evaluation of routine NAPL gauging data from monitoring wells located upgradient, downgradient, and within the containment trench. This data will be used to confirm that the wall is serving to contain and collect NAPL as designed. In addition, NAPL gauging data from other Site wells will be used to determine the effectiveness of the routine NAPL removal program;
- The results of long term groundwater monitoring will be used to evaluate the effectiveness of both the NAPL collection and removal and natural attenuation in improving overall Site groundwater quality;
- Potential volatilization issues will be monitored via an evaluation of long term groundwater quality trends. In addition, in the event future buildings are constructed,



the mechanisms put in place (if necessary) to address potential volatilization will be monitored for consistency with their respective objectives; and

- With respect to the engineered cap, the quality of the imported fill used for construction will be tested to confirm compliance with RIDEM requirements. Further details are provided in Section 11.10. In addition, the integrity of the cap will be inspected at least annually and repairs (if required) will be made expeditiously to ensure remedial objectives associated with soils are achieved.

### 8.00 PROPOSED SCHEDULE FOR REMEDIATION (RULE 9.07)

A milestone schedule for the implementation of the RIDEM preferred remedy is as follows:

- Submittal of Permit Application Package: December 2012
- Receipt of Permits and Approvals (RIDEM and CRMC): Late January 2013
- Receipt of Remedial Action Approval (RIDEM): Early January 2013
- Site Preparation and Mobilization: March 2013
- Containment Wall Installation: April - May 2013
- Stormwater Management System Installation: May - June 2013
- Engineered Cap Installation: May - July 2013
- Submittal of Remedial Action Closure Report: August 2013

### 9.00 CONTRACTORS AND CONSULTANTS (RULE 9.08)

The engineering consultant involved in the implementation of the remedy is identified below. Once the General Contractor(s) are selected they will be identified to RIDEM under separate cover.

Firm	Role	Contact	Address	Phone Number
GZA	Engineering Consultant	James Clark	655 Winding Brook Drive, Suite 402, Glastonbury, CT 06033	860-858-3134
<i>To be determined</i>	General Contractor	---	<i>To be determined</i>	---

### 10.00 SITE PLAN (RULE 9.09)

A Site plan that depicts the final installed remedy is included as **Figure 14** in Appendix B. This Site plan also depicts the long term groundwater monitoring well network.

## 11.00 DESIGN STANDARDS AND TECHNICAL SPECIFICATIONS (RULE 9.10)



The following sections describe each of the proposed remedial elements to meet the stated remedial objectives. In addition, this section also outlines certain Best Management Practices (BMPs) that will be implemented during the performance of the remedial work to mitigate the potential off-Site migration of impacted Site materials and describes the necessary permits/approvals to construct the remedy. Remedial design details and associated technical specifications for the remedy are included on **Figures 1 through 23** in Appendix B. These figures and specifications were prepared under the supervision of Mr. Todd Greene, a State of Rhode Island licensed Professional Engineer (P.E. License No. 8567).

Abandonment of certain existing monitoring and recovery wells (thirty-four wells) will be required to facilitate installation of the engineered cap, the stone collection trench, and the stormwater management systems outlined below. A listing of the wells to be abandoned is provided in Table 2 and depicted on **Figure 7**. As indicated on **Figure 7**, these wells are primarily located in the eastern portions of Lots 325 and proximate to the stone collection trench and the central portion of Lot 481 where NAPL impacts have not been observed. These wells will be abandoned consistent with *Appendix 1 of the Rhode Island Water Quality Regulations*. The remaining existing monitoring well network will be protected, extended and reset as necessary during remedial implementation activities. This procedure will require adjusting the heights of the well casings to match proposed final Site grades and installation of new curb boxes. Upon completion of the remedy, the heights of the adjusted well casings will be surveyed relative to NGVD 1929. We anticipate that the long term groundwater monitoring well network will consist of thirty-six (36) wells as depicted on **Figure 14**.

In addition, to facilitate the construction of the engineered cap and containment/collection trench described below, certain existing Site features will require demolition and removal. As indicated on **Figure 6**, these features include but are not limited to, one of the two buildings on the western portion of Lot 481, the trailers on Lot 481, limited areas of asphalt pavement and landscaping, concrete structures on Lot 325, and the concrete containment walls associated with a former aboveground storage tank (AST) which was located on the southeastern portion of Lot 325. As indicated on **Figure 7**, certain portions of this former containment structure will be removed to depths necessary to allow the installation of the containment/collection trench and certain stormwater management systems described below. The eastern portion of the concrete containment wall along the southern property boundary of Lot 325 will be removed to an elevation coincident with final engineered cap grade. The deeper portions foundations portions of this wall remain in place to minimize potential damage to adjacent structures during removal. This section of concrete retaining wall will be replaced with chain-link fencing, the posts of which will be installed within the former concrete wall.



### 11.10 ENGINEERED CAP

A minimum 1-foot thick layer of imported clean gravel underlain by a non-woven high visibility geotextile fabric (Mirafi 140N or equivalent) which acts as an isolation/warning barrier will be installed across the entire Site (approximately 5.6 acres) to mitigate potential direct contact with impacted Site materials. The subgrade and final grade elevations associated with the cap are depicted on **Figures 8 and 9**. These elevations were integrated with engineered stormwater management systems designed to collect and treat stormwater Water Quality Volume and to minimize the volume of off-Site soil disposal. In order to achieve required grades, the western portion of Lots 128, 481, and 489 will be raised by a maximum of 4.5 feet above existing grade. These grade changes will be accomplished via the installation of Versa-Loc® retaining walls along the southern edge of Lot 489, the western edges of Lots 128, 481, and 489, and the northern edge of Lot 481 and via demolition of a building currently located in the southwestern portion of Lot 481. Grades across Lot 325 will be lowered by a maximum of 2 feet. The grade changes on Lot 325 were necessary to integrate stormwater management requirements (see Section 11.70) into the cap design and to minimize the volume of soil disposed off-Site. Profiles depicting these grade changes and retaining walls are included on **Figures 10 and 11**. Details on the retaining walls are included on **Figure 20**.

In addition, installation of a clean utility corridor has been integrated into the cap to facilitate potential future utility installations associated with redevelopment of the Site and to limit potential future disturbance of the engineered cap. The clean utility corridor will be installed in a west/east orientation extending from Allens Avenue to the existing pier. The corridor will be approximately 370 feet long, 6 feet wide and 4 feet deep as depicted on **Figures 9 and 14**. The excavated soil generated from this corridor will be used as fill to achieve subgrade elevations depicted on **Figure 8** to the extent practical. Upon excavation, the bottom and the sides of the trench will be lined with a non-woven high visibility geotextile fabric (Mirafi 140N) acting as an isolation/warning barrier and backfilled with clean imported fill.

It is estimated that approximately 4,400 cubic yards of existing Site materials will be re-graded and 495 cubic yards of clean fill will be imported to achieve the subgrade elevations depicted on **Figure 8** and that approximately 9,000 cubic yards of clean import fill will be necessary to construct the engineered cap and achieve the final grade elevations depicted on **Figure 9**. A minimal amount of excess material and stained soils will be disposed off-Site as part of the re-grading and capping work (currently estimated at less than 100 cubic yards).

The contractor performing the work will be required to provide evidence through laboratory testing that all imported soil (loam, sand, gravel, and processed stone) do not contain contaminants above the Method 1 Residential Direct Exposure Criteria. Accordingly, at a minimum, representative samples of the imported fill will be tested for the following analytes at the indicated frequency.



Analyte	EPA Test Method	Minimum Frequency of Testing
Total Petroleum Hydrocarbons	8100M	One sample per 2,000 CY
Volatile Organic Compounds	8260	One sample per 2000 CY
Semi-Volatile Organic Compounds	8270	One sample per 2,000 CY
Priority Pollutant Metals (13)	6010 & 7471A	One sample per 2,000 CY
Arsenic & Lead	6010	One sample per 500 CY

All fill imported to the Site will be sampled prior to delivery and placement, regardless of the source of the material. This analytical data will be supplemented with a statement from the facility that provides the material attesting to the material's origin and suitability.

#### 11.20 STONE CONTAINMENT/COLLECTION TRENCH

A stone containment/collection trench will be installed on the downgradient edge (east side) of Lot 325 and along the shoreline of Lots 489 and 501 to mitigate the potential migration of NAPLs within the upper aquifer to the Providence River. The layout of this trench is depicted on Figure 12. The trench will have dimensions of approximately 500 feet long, 3 feet wide and will extend at least 4 feet into the Upper Silt Layer (approximately 19 to 30 feet below existing grade). The trench will be constructed using excavators equipped with extended arms or clam shell equipment. The sidewalls of the trench will be supported using slurry wall techniques, temporary steel sheet piling, trench boxes, or a combination of techniques.

The unsaturated (dry) soils excavated from the trench will be re-used as fill on Site to achieve the subgrade elevations depicted on Figure 8 to the extent practical. Materials removed from below the water table will be drained into the trench prior to placement in a lined soil management area (see Figure 15). The trench soils will be stockpiled and further dewatered in the soils management area and subsequently disposed off-Site. Drained liquids will be collected, containerized and subsequently disposed off-Site.

A 40-mil HDPE liner will be installed on the downgradient (east) side of the trench to facilitate the collection of LNAPL. This liner will extend from approximately elevation 6 feet to -2.5 feet (at least 2 feet below the water table). Individual sections of the liner will be overlapped a minimum of 2 feet and an average of 4 feet.

The trench will be backfilled with a well graded filter material from the base of the excavation to approximately elevation 6 feet. Shallow and deep recovery wells will be installed within the center of the trench at a frequency of every 50 feet to facilitate the recovery of LNAPL and DNAPL. The shallow wells will consist of 4-inch diameter, 5 to 10 foot long, Schedule 40 PVC well screens set to span the groundwater table. The deep recovery wells will consist of 4-inch diameter, 5 to 8-foot long stainless steel well screens set to span the interface of the Fill/Upper Sand Layer and Upper Silt Layer. A 2-foot long, 4-inch diameter, stainless steel riser pipe will be installed below the well screen to act as a sump for the collection of DNAPL.



Six monitoring wells will also be installed on the downgradient side of the stone collection trench to evaluate the performance of the trench. The approximate locations are shown on **Figure 12**. The actual locations of these wells will be dependent on Site logistical constraints. These wells will be installed via hollow stem auger drilling techniques and will extend at least 4 feet into the top of the Upper Silt Layer (similar to the stone collection trench). Each well will be equipped with a single well screen that extends from the bottom of the well and spans the natural groundwater table.

Additional details related to the installation of the stone collection trench are provided on **Figures 13 and 16**.

In addition to the stone containment/collection trench, three shallow recovery wells (GZ-1 through GZ-3) will be installed on the southern edge of Lot 325 as indicated on **Figure 12**. As described previously, these additional wells along with existing monitoring well MW-536 will serve to mitigate potential migration of LNAPL from Lot 325 to the south. The recovery wells will consist of 4-inch Schedule 40 PVC well screens set to span the groundwater table. Additional details related to these recovery wells are provided on **Figure 16**.

### 11.30 NAPL RECOVERY

As described above, the collection trench will be equipped with 4-inch diameter shallow and deep well pairs every 50 feet for the collection and recovery of LNAPL and DNAPL. LNAPL and DNAPL recovery operations will also be performed on the existing monitoring well network which will be supplemented with three wells located along the southern portion of Lot 325 (GZ-1, GZ-2, and GZ-3). Based on the existing data set, LNAPL recovery will be focused at twenty-one wells<sup>2</sup> (GZ-1, GZ-2, GZ-3, MW-11, MW-12R, MW-233R, MW-240, MW-246R, MW-424S/I, MW-425S/R, MMW-428S/I, MW-435R, MW-436S/I, MW-522, MW-523, MW-530, MW-531, MW-536, MW-537, MW-604S, and MW-606S) on Lots 325, 489, and 501 and DNAPL recovery will be focused at thirteen existing wells (MW-11, MW-12R, MW-246R, MW-424S/I, MW-425S/R, MW-426S/I, MW-431I, MW-531, MW-537, MW-603D, MW-604D, MW-604S, and MW-605D) on Lots 325, 489, and 501. LNAPL recovery activities will be performed either manually via periodic removal with peristaltic pumps or passively with oil collection traps installed within the wells. DNAPL recovery activities will be performed manually via periodic removal with peristaltic pumps or suction pumps. As described in the *RDL*, NAPL gauging and recovery activities will initially be performed monthly, subject to a reduced frequency upon RIDEM approval.

The locations of the shallow and deep well pairs within the stone collection trench are shown on **Figure 12** and the additional monitoring/recovery well locations are shown on **Figure 14**.

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<sup>2</sup> If any existing monitoring wells included in NAPL recovery operations are damaged or destroyed during the performance of the remedial work, the well(s) will be replaced.



**11.40 LONG TERM NATURAL ATTENUATION GROUNDWATER MONITORING**

The identified dissolved phase groundwater impacts will be addressed via recovery/removal of the identified NAPLs to the extent practicable, combined with long term natural attenuation. The long term natural attenuation groundwater monitoring program will consist of gauging the entire Site monitoring well network for the presence of NAPL and the collection of groundwater samples from the monitoring wells<sup>3</sup> in the following table on a quarterly basis for one year to evaluate seasonal trends. After the completion of a year of quarterly monitoring, the frequency will be modified to an annual program. In the longer term, this annual program may be modified to bi-annual or less frequently depending on an evaluation of data trends. The duration and frequency of this groundwater monitoring will be determined based on subsequent discussions with RIDEM.

Monitoring Well ID	Location	Screened	Rationale
MW-201	Lot 481	Above Upper Silt Layer	Evaluate groundwater quality in upgradient portion of this lot.
MW-216	Lot 128	Above Upper Silt Layer	Evaluate groundwater quality in upgradient portion of this lot.
MW-218	Lot 128	Above Upper Silt Layer	Evaluate groundwater quality downgradient of this lot.
MW-219R2	Lot 481	Above Upper Silt Layer	Evaluate groundwater quality downgradient of this lot.
MW-423S	Lot 489	Above Upper Silt Layer	Evaluate groundwater quality in upgradient portion of this lot.
MW-431S	Lot 489	Above Upper Silt Layer	Evaluate groundwater quality in upgradient portion of this lot.
MW-507	Lot 481	Above Upper Silt Layer	Evaluate groundwater quality downgradient of this lot.

In addition to these seven wells, groundwater samples will be collected from the six monitoring wells installed on the downgradient side of the stone collection trench on Lots 325, 489, and 501 to evaluate downgradient groundwater quality. The locations of these monitoring wells are depicted on **Figure 14**. Please note: groundwater samples will not be collected for analytical testing from wells that contain measurable amounts of NAPL.

Groundwater sampling will be performed in general accordance with the US EPA's July 30, 1996 *Low Stress (low flow) Purging and Sampling Procedure*. As part of this sampling methodology, well stabilization will be determined through the measurement of specific water quality parameters (pH, temperature, specific conductance, dissolved oxygen, oxidation reduction potential, and turbidity) during the purging process. Purging will continue until these parameters have stabilized. Groundwater samples will be analyzed for VOCs and natural attenuation parameters including nitrates, iron, manganese, sulfate and total organic

<sup>3</sup> If any existing monitoring wells included in the long term natural attenuation monitoring well program are damaged or destroyed during the performance of the remedial work, the well(s) will be replaced.

carbon). In addition, a Matrix Spike/Matrix Spike Duplicate, a blind duplicate, and a VOC trip blank (in each cooler submitted to the laboratory) will be analyzed each sampling round.

The results of this natural attenuation groundwater monitoring program will be documented in annual reports submitted to RIDEM.



#### 11.50 ENGINEERED CAP, CONTAINMENT WALL, AND WELL INSPECTIONS AND MAINTENANCE

The engineered cap, the stone collection trench, and monitoring and recovery well network will be inspected at least annually by a qualified environmental professional for evidence of ground surface settlement, erosion, or other damage. Any observed deficiencies will be repaired in an expedited manner.

Consistent with the ELUR, the results of these inspection and repair activities will be documented in annual reports prepared by a qualified environmental professional and submitted to RIDEM.

#### 11.60 ENVIRONMENTAL LAND USAGE RESTRICTION

The placement of an ELUR on the deeds of the five lots comprising the Site is an integral component of the remedy. A draft version of the proposed ELUR<sup>4</sup> is included in Appendix D and includes the following:

- Restrict residential and other inconsistent Site use;
- Prohibits potable use of Site groundwater;
- Prohibits disturbance of soil beneath the engineered cap without permission from RIDEM, except as permitted in the *Soil Management Plan (SMP)*;
- Prohibits human exposure to soil containing hazardous materials and/or petroleum at concentration exceeding RIDEM approved direct exposure criteria;
- Requires appropriate vapor control measures be included on structures constructed over groundwater containing hazardous materials and/or petroleum at concentrations exceeding RIDEM approved GB Groundwater Objectives;
- Requires that the engineered cap, stone collection trench, and monitoring and recovery well network remain in-place and in good condition;
- Requires the monitoring well network not be disturbed and shall be properly maintained to allow for long term evaluation of groundwater quality; and
- Requires where future activities are likely to have the potential for release of hazardous materials to the ground surface, a RIDEM approved impermeable barrier or containment structure be installed and maintained.

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<sup>4</sup> Please note that Appendix D includes separate draft ELURs for the three property owners (Lot 128 – Cargill, Lot 325 – Gail Conley, and Lots 481 and 489 – National Grid). The *SMP* applies to all three ELURs.



The ELUR includes an integral *SMP* that establishes the procedures and provisions should future construction/maintenance activities at the Site require the need to disturb soils beneath the engineered cap. The *SMP* serves to supplement, and will be initiated by, the RIDEM notification requirement established by the ELUR for the Site. Please refer to Appendix C for a copy of the *SMP* developed for the Site.

#### 11.70 STORMWATER MANAGEMENT

In order to meet Minimum Standard 3 for Re-Development Sites of the December 2010 *Rhode Island Stormwater Design and Installation Standards Manual*, stormwater management systems will be installed on the downgradient (east) edges of the Site to reduce the amount of pollutants discharged to the Providence River. These systems have been designed to collect and treat the required Water Quality Volume (WQ<sub>v</sub>) from each of the Lots which comprise the Site.

As indicated on **Figures 9 and 14**, the stormwater treatment systems for Lots 128, 481, 489 and 501 consist of concrete forebays for stormwater pre-treatment followed by sand filters for primary treatment. The stormwater system on Lots 489 and 501 will discharge to the Providence River via the existing drain within Public Street and the stormwater system on Lot 481 will discharge to the Providence River via a new outfall installed on the northeast corner of the lot. The concrete forebays have dimensions of 180 feet long by 6 feet wide and have a working depth of 3 feet and 1-foot of freeboard. The sand filters have dimensions of 80 feet long by 25 wide and have a filter depth of 2.5 feet with 1-foot of hydraulic head and 1-foot of freeboard. Stormwater runoff in excess of 1-inch precipitation is designed to collect in the concrete forebays and by-pass the sand filters to discharge directly to the Providence River.

The stormwater treatment system for Lot 325 consists of a lined grass swale forebay that will discharge to a lined sand filter unit. The sand filter will subsequently discharge to the Providence River via the existing drain within Public Street. Stormwater runoff in excess of 1-inch precipitation is designed to collect in the swale and discharge through an overflow grate located on the sand filter's outlet structure and discharge to the Providence River.

The layout of the proposed stormwater management system and associated details are shown on **Figures 14, 17 through 19, and 21 through 23**. Design calculations are provided in Appendix G.

#### 11.80 BEST MANAGEMENT PRACTICES

During the implementation of the remedy, the following Best Management Practices (BMPs) will be implemented.

- Dust Control – Dust control measures will be employed to mitigate the potential for release of airborne particulate matter beyond the limits of the Site in accordance with RIDEM *Air Pollution Control Regulation No. 5, Fugitive Dust*. Methods of dust control will consist of sprinkling the ground surface with water, covering of temporary stockpiles, mulching, or similar methods. On-Site and perimeter dust



monitoring will be performed during all construction activities. This monitoring will include both visible observations as well as measurements of particulate dust using field instruments. If excessive dust generation occurs and cannot be reasonably controlled, the job shall be shut down until appropriate engineering control measures are implemented.

- Sedimentation and Erosion Controls – Prior to the commencement of any Site work, with the exception of the east (downslope) side of Lots 489 and 501, staked hay bales and silt fencing will be installed on the downgradient (east side) of Lots 481 and 489. The east side of Lots 489 and 501 consists of a rip-rap slope which will preclude the installation of silt fencing so only staked haybales will be installed in this area. Staked silt fencing will be installed along the remaining edges of Lots 128, 481, and 489. Due to the presence of existing concrete walls along the western and southern edges of Lot 325, staked haybales and silt fencing will be installed on the eastern (downgradient) edge of Lot 325 and staked silt fencing will be installed on the northern edge of the lot. A turbidity curtain will also be installed within the cove area prior to initiation of any construction activities. The layout of these sedimentation and erosion control devices are shown on **Figure 4** and sedimentation and erosion control details are provided on **Figure 15**.
- Temporary chain link construction fencing will be maintained around the perimeter of the Site to prevent access by the general public as shown on **Figure 5**
- Impacted excavated materials may be temporarily staged on two layers of 10-mil polyethylene sheeting in working stockpiles in the areas depicted on **Figure 4**. At the end of each work day and to the extent practical during the workdays, all stockpiles will be covered with a layer of 10-mil polyethylene sheeting to control the generation of wind-blown dusts and potential migration of soils with stormwater runoff. Stockpile areas will be equipped with appropriate controls to limit the loss of the cover and protect against storm water erosion. These controls will include the installation of haybales surrounding the perimeter of the stockpiles and weighting the polyethylene cover with sand bags or concrete blocks. Stockpiles will be inspected daily by Site personnel.

#### 11.90 REGULATORY PERMITS/APPROVALS

The following permits/approvals are necessary to implement the remedy.

- A Category B Coastal Resources Management Council (CRMC) Assent since the Site is located within their 200-foot jurisdictional area and involves the disturbance of more than 2 acres of land and more than 10,000 cubic yards of material adjacent to a water body. In addition, a variance consistent with Section 120 of the December 2010 *Coastal Resources Management Program* manual (aka, the Red Book) will also be required due to grading/filling within 50-feet of the shoreline of the Providence River;



- A Rhode Island Pollutant Discharge Elimination System (RIPDES) *General Permit for Stormwater Discharges Associated with Construction Activities*; and,
- A *Water Quality Certification* to fulfill the requirements of Section 401 of the *Clean Water Act* since the remedial work involves considerable land disturbance adjacent to a coastal water body.

GZA will submit a permit application package to CRMC and RIDEM for these permits/approvals in December 2012 and Site remedial activities will not be initiated until these authorizations are received.

In addition, GZA also evaluated the applicability of RIDEM's *Air Pollution Control Regulation No. 9 – Air Pollution Control Permits* to the remedy. The results of this evaluation indicate that the remedial activities do not have the potential to increase emissions of listed air contaminants by greater than the minimum quantity specified in Appendix A of the regulations and a Minor Source Permit is therefore not required. The results of this evaluation are included in Appendix G.

#### **12.00 SET-UP PLANS (RULE 9.11)**

As indicated above, prior to the performance of any intrusive Site activities, sedimentation and erosion controls will be installed to mitigate the potential migration of Site materials. The layout of these sedimentation and erosion control devices are shown on **Figure 4** and sedimentation and erosion control details are provided on **Figure 15**.

In addition, an equipment staging area will be set-up in the northwestern portion of Lot 481 outside the 200 foot zone regulated by CRMC using orange construction fencing as indicated on **Figure 5**. This area will be utilized for light maintenance activities on the equipment and refueling operations. No construction vehicles actively working in the construction Site will be fueled in a manner that would allow an inadvertent release to flow into the adjacent surface water. All oil, hydraulic fluid, or other hazardous materials used in this area will be stored in original containers; fuels will be stored in tightly sealed containers which are clearly marked; and all such material will be stored under a roof or in a covered enclosure.

#### **13.00 EFFLUENT DISPOSAL (RULE 9.12)**

As indicated above, to the extent practical, soils disturbed during the work will be used as on-Site fill to achieve the subgrade elevations depicted on **Figure 8**. In the event that excess soils are generated that cannot be used as on-Site fill, the soil will be disposed off-



Site. Prior to off-Site disposal, composite samples will be collected from the stockpiled excess soil and analyzed based on the frequency and the parameters required by the selected disposal facility.

Any groundwater or stormwater collected during the course of the work will be containerized in temporary storage tanks or fractionation tanks prior to off-Site disposal. Samples of the collected water will be collected and analyzed based on the frequency and the parameters required by the selected disposal facility<sup>5</sup>.

Copies of all manifest(s) and Bills of Lading (BOLs) documenting the off-Site disposal of these materials will be included in the *Remedial Action Closure Report*.

#### 14.00 CONTINGENCY PLAN (RULE 9.13)

Unexpected soil conditions may be encountered during excavation. The following provides a listing of points of contacts in the event of an unexpected incident involving impacted soil and/or groundwater.

Firm	Contact	Address	Phone Number
GZA GeoEnvironmental, Inc.	James Clark	655 Winding Brook Drive Suite 402 Glastonbury, Connecticut 06033	860-858-3134 860-250-6344 (cell)
National Grid	Kenneth E. Lento	Project Manager National Grid 40 Sylvan Road Waltham, MA 02451	617-791-2627
Clean Harbors	Peter Joseph	8 Dexter Road East Providence, RI 02914	401-431-1847 401-265-0053(cell)
RIDEM, DEM Project Manager	Joseph Martella	235 Promenade Street Providence, Rhode Island 02903	(401) 222-2797 Ext. 7109
RIDEM 24-Hr Emergency Response	NA	235 Promenade Street Providence, Rhode Island 02903	401-222-3070

GZA has prepared a *Contingency Plan/Health & Safety Plan*, attached as Appendix H, to address unanticipated conditions/incidents encountered at the property during Construction. The *Contingency/Health & Safety Plan* is applicable to GZA personnel and will be available at the Site at all times during the implementation of the remedial action described herein. The Contractor selected to perform the work outlined in this report will be required to prepare and implement a Health and Safety Plan during the remediation activities as well.

<sup>5</sup> As an alternative, groundwater and/or collected stormwater generated during the course of the work may be treated on-Site and discharged to the Providence River under a Rhode Island Pollutant Discharge Elimination System Remediation General Permit.

### 15.00 OPERATING LOG (RULE 9.14)

An Operating Log will be developed and maintained at the Site during the performance of the remedial work outlined herein. The log will subsequently be maintained by National Grid for a minimum period of three years. The Operating Log will include, at a minimum, the following information:



- Dates and time periods during which the remedial work described herein was performed;
- Daily Field Reports (DFRs) will be prepared during remedy implementation which will summarize personnel and equipment on-Site, work performed, health and safety monitoring conducted, results of air quality monitoring, etc.
- Records of any laboratory analysis and field screening performed as part of the remedial action;
- Description of instances under which the Contingency Plan was implemented; and,
- Inspection reports detailing compliance with the remedial specifications described herein and the actions taken to address non-compliant practices/conditions.

A copy of the Operating Log, including the DFRs will be provided to the Department at the completion of the project as part of the *Remedial Action Closure Report*. In addition, bi-weekly email updates regarding the status of the work being performed at the Site will be submitted to the Department during the remedial work.

### 16.00 SECURITY PROCEDURES (RULE 9.15)

Access to the Site during the remedial activities will be limited to the current Site Owners, their contractors, and their consultants or other designated representatives. As indicated on **Figure 5**, chain-linked fencing or equivalent barriers, which provide restrictions to the soil disturbance areas, as well as appropriate signage will be maintained to limit unauthorized access to the Site. The fencing will be locked at the end of each day as part of the daily shutdown procedures.

### 17.00 SHUTDOWN, CLOSURE AND POST CLOSURE REQUIREMENTS (RULE 9.16)

In the event that the remedial work is suspended for an extended period of time, (i.e., greater than 1 week), RIDEM will be notified and the security fencing will remain in-place, closed and locked. Daily shut-down procedures will include covering and securing of all soil stockpiles, as well as locking the perimeter fencing.

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Following completion of the remedial work, annual compliance inspections of the engineered cap and stone collection trench will be performed to ensure that the provisions of the ELUR are being maintained.



#### **18.00 INSTITUTIONAL CONTROLS AND NOTICES (RULE 9.17)**

As indicated previously, public notice of the preferred remedy described herein was performed in March 2012 consistent with Rules 7.07 and 7.09 of the *Remediation Regulations* subsequent to receipt of the Program Letter from RIDEM. Site abutters will be notified in writing prior to initiation of construction activities. In addition, there is a 30-day public comment period associated with the CRMC Assent described in Section 11.90.

The ELUR described in Section 11.60 and included in Appendix D will be legally recorded on the property land records for Lots 128, 325, 481, 489, and 501. In addition, each property owner will maintain a copy of the ELUR and associated *Soil Management Plan*.

#### **19.00 COMPLIANCE DETERMINATION (RULE 9.18)**

As long as the remedial measures described in this plan are implemented and maintained, the Site will be considered to be in compliance with the *Remediation Regulations*. At the completion of the remedial construction activities described herein, a *Remedial Action Closure Report* will be submitted to RIDEM documenting the work performed.

To evaluate and record compliance with the provisions of the ELUR, a qualified environmental professional will evaluate the compliance status of the Site on an annual basis. Upon completion of the evaluation, the environmental professional will prepare and simultaneously submit to RIDEM, an evaluation report detailing the findings of the inspection and noting any compliance violations at the Site. If the Property is determined to be out of compliance with the terms of the ELUR, the responsible parties will submit a corrective action plan in writing to RIDEM within ten (10) days of receipt of the evaluation report, indicating the plans to bring the Site into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

**20.00 CERTIFICATION (RULE 9.19)**

To address Rule 9.19 of the Remediation Regulations, the following statements of certification are provided.



*GZA GeoEnvironmental, Inc. certifies to the best of its knowledge, that this Remedial Action Work Plan is complete and accurate.*

A handwritten signature in black ink, appearing to read "James J. Clark".

---

James J. Clark  
Principal-In-Charge  
GZA GeoEnvironmental, Inc

*National Grid certifies, to the best of its knowledge, that this Remedial Action Work Plan is a complete and accurate representation of the site and the release and contains all known facts surrounding the release.*

A handwritten signature in black ink, appearing to read "Michele Leone".

---

Michele Leone  
National Grid

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50 Kennedy Plaza, Suite 1500  
Providence, RI 02903-2319

p: 401-274-2000 f: 401-277-9600  
hinckleyallen.com

**Robin L. Main**  
Direct Dial 401-457-5278  
rmain@hinckleyallen.com

May 29, 2013

***VIA HAND DELIVERY AND ELECTRONIC MAIL***

Ms. Anna Stetson, City Clerk  
Office of the City Clerk  
Providence City Hall  
25 Dorrance Street  
Providence, Rhode Island 02903  
astetson@providenceri.com

**RE: Petition for Easement on Public Street by The Narragansett Electric Company d/b/a National Grid**

Dear Ms. Stetson:

Please find enclosed a May 9, 2013 Order of Approval issued by the Rhode Island Department of Environmental Management. This Order approves the work described in the Amended Petition to the City Council for an Easement on Public Street for The Narragansett Electric Company d/b/a National Grid that is scheduled for hearing before the Public Works Committee on May 29, 2013. Please do not hesitate to contact me with any questions. Thank you.

Very truly yours,

A handwritten signature in cursive script that reads "Robin L. Main /aw".

Robin L. Main

Enclosure

cc: Kenneth Lento, National Grid  
David Rusczyk, GZA  
Jillian Barker, Esq.

► ALBANY ► BOSTON ► CONCORD ► HARTFORD ► NEW YORK ► PROVIDENCE

#51632969 HINCKLEY, ALLEN & SNYDER LLP, ATTORNEYS AT LAW  
(57972/133068)



**RHODE ISLAND  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**

235 Promenade Street, Providence, RI 02908-5767

TDD 401-222-4462

**ORDER OF APPROVAL**

May 9, 2013

**CASE No. 98-042 (Including 98-042a & 98-042b)**

**CERTIFIED MAIL**

Mr. Kenneth E. Lento - Project Manager - Site Investigation & Remediation  
National Grid  
40 Sylvan Road  
Waltham, MA 02451-1120

RE: Northeast Petroleum, Inc.  
170 Allens Avenue  
Providence, Rhode Island  
Plat 46 / Lots 128, 325, 481, 489 and 501

Dear Mr. Lento:

Enclosed please find the Order of Approval (the Order) for the proposed Remedial Action Work Plan (RAWP), received December 3, 2012, for the encapsulation of contaminated soils, the physical containment of non-aqueous phase liquid (NAPL) impacts by the installation of a partially penetrating wall/stone collection trench along the downgradient site boundary, with monthly focused light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) recovery, implementation of an Environmental Land Usage Restriction (ELUR) on the entire property, periodic long-term groundwater monitoring with monitored natural attenuation, and annual cap and containment wall inspections and maintenance at the abovementioned property. Please review the stipulations of this Order thoroughly to ensure your compliance with the requirements.

Please notify this office 48 hours prior to the beginning of any work related to the remediation of the property. If you have any questions regarding this letter or would like the opportunity to meet with Department personnel, please contact me by telephone at (401) 222-2797, ext. 7109, or by E-mail at [joseph.martella@dem.ri.gov](mailto:joseph.martella@dem.ri.gov).

This Order shall be recorded in the land evidence records of the City of Providence within thirty (30) days of execution and a recorded copy returned to the Department within fifteen (15) days of recording.

Sincerely,

Joseph T. Martella II  
Senior Engineer  
Office of Waste Management

Northeast Petroleum, Inc., 170 Allens Avenue, Providence, Rhode Island  
Order of Approval

May 9, 2013

Page 1 of 7

30% post-consumer fiber

cc: Terrence D. Gray, P.E., Assistant Director, RIDEM/AW&C  
Leo Hellested, P.E., Chief, RIDEM/OWM  
Kelly J. Owens, RIDEM/OWM  
Sofia Kaczor, RIDEM/OWM  
Eric Beck, RIDEM/OWR/RIPDES  
Alisa Richardson, RIDEM/OWR  
Neal Personeus, RIDEM/OWR/WQC  
Susan Forcier, Esq., RIDEM/OLS  
David S. Reis, RI CRMC  
Joseph Baker, Cargill  
Patrick T. Conley, Esq. & Gail Conley  
Robin Main, Esq., HA&S  
Jennifer Sulla, Esq., Mintz Levin P.C.  
David Rusczyk, GZA  
William T. McCune, Arcadis  
Donald D. Gralnek, PRA

## DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

In the matter of the application for Remedial Action Approval at:  
Northeast Petroleum, Inc.  
170 Allens Avenue  
Providence, Rhode Island  
Case No. 98-042 (Including 98-042a & 98-042b)

### ORDER OF APPROVAL

In the above entitled matter The Narragansett Electric Company d/b/a/ National Grid (National Grid) is Owner and Responsible Party for Plat 46 / Lots 481, 489 and 501, Cargill Incorporated is Owner and Responsible Party for Plat 46 / Lot 128, and Ms. Gail Conley is Owner and Responsible Party for Plat 46 / Lot 325. Wherein National Grid in its capacity as Performing Party for the remediation of the property located at 170 Allens Avenue (the Site), Providence Plat 46 / Lots 128, 325, 481, 489 and 501, filed with the Rhode Island Department of Environmental Management (the Department) the following documents, which collectively fulfill the requirements of Section 9.00 (Remedial Action Work Plan) of the Department's Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations), amended November 9, 2011:

1. Remedial Action Work Plan, 170 Allens Avenue, Providence, Rhode Island, received by the Department on December 3, 2012, and prepared by GZA GeoEnvironmental, Inc. (GZA); and
2. Letter Correspondence Re: Remedial Action Work Plan (RAWP), 170 Allens Avenue, Providence, Rhode Island, Plat 46 Lots 128, 325, 481, 489 and 501, RIDEM Case No. 98-042 (including 98-042a & 98-042b), dated May 6, 2013, received by the Department May 7, 2013, prepared by GZA, and including attached revised versions of the individual Environmental Land Usage Restrictions for the three property owners, and a single revised version of the post-construction Soil Management Plan.

These documents describe a plan to remediate existing contamination pursuant to Rhode Island General Laws 23-19.14-1 et seq. and the Department's Remediation Regulations, as amended November 9, 2011, in accordance therewith.

It is the Department's intent that all conditions set forth in this Order of Approval (Order) shall remain in full force and effect unless specifically altered by the Department in writing. Furthermore, this letter continues to place primary responsibility for the construction, operation, maintenance, and monitoring of the approved Remedial Action Work Plan (RAWP) and its associated implementation on National Grid. As a Responsible Party and a Performing Party, National Grid is expected to implement the RAWP in an expeditious and professional manner that prevents non-compliance with this letter and said RAWP, and is protective of human health and the environment.

Upon consideration thereof, the Department of Environmental Management's Office of Waste Management (OWM) approves said plan or means to remediate contamination through this Order provided that:

1. Implementation of the RAWP at the Site shall be initiated within ninety (90) days of execution of this Order.
2. The OWM shall receive written notification forty-eight (48) hours prior to the initiation of any remedial activities.
3. All work must be performed in accordance with all applicable regulations and the Department approved RAWP, inclusive of schedules, and must be consistent with Section 11.00 of the Remediation Regulations.
4. The encapsulation of contaminated soils remediation goal shall be consistent with Rule 8.01 of the Remediation Regulations, achieved by the installation of a site-wide engineered control cap consisting of one (1) foot of clean gravel placed over a high visibility geotextile fabric marker barrier/warning layer, consistent with the Department's requirement to provide a level of protection equivalent to a minimum of two (2) feet of clean soil, with implementation of an Environmental Land Usage Restriction (ELUR) on the entire property, and annual cap inspections and maintenance. The physical containment of non-aqueous phase liquid (NAPL) impacts remediation goal shall be consistent with Rule 8.01 of the Remediation Regulations, achieved by the installation of a partially penetrating wall/stone collection trench along the downgradient site boundary, monthly focused light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) recovery, periodic long-term groundwater monitoring with monitored natural attenuation, and annual containment wall inspections and maintenance. Specifically, the groundwater remedial objective shall be elimination to the extent practical and control of all Upper Concentration Limit (UCL) exceedances (e.g. NAPL) and on-site containment and control of all Method 1 GB Groundwater Objective exceedances.
5. National Grid, and their consultant, are aware of the points of compliance requirements and Rule 8.08 of the Remediation Regulations for offsite GB groundwater exceedances. Rule 8.08 requires a Responsible Party to meet compliance with the GB Soil Leachability Objectives and GB Groundwater Objectives for all contaminants of concern at the property line.
6. The remedial objectives for groundwater at the Site shall be the Method 1 GB Groundwater Objectives, as specified in the Department's Remediation Regulations at the property line, and elimination to the extent practical and control of all UCL exceedances (e.g. NAPL).
7. Sampling and analysis of all media involved in the Remedial Action shall be conducted in strict accordance with the RAWP, the Remediation Regulations, and the requirements of this Order.
8. LNAPL recovery will be performed at twenty-two (22) wells (GZ-1, GZ-2, GZ-3, MW-11,

MW-12R, MW-233R, MW-240, MW-246R, MW-424S/I, MW-425S/R, MW-427S, MMW-428S/I, MW-435R, MW-436S/I, MW-522, MW-523, MW-530, MW-531, MW-536, MW-537, MW-606S, and one replacement installed well near the former location of RW-2R) on Lots 325, 489, and 501. DNAPL recovery will be performed at thirteen (13) existing wells (MW-11, MW-12R, MW-246R, MW-424S/I, MW-425S/R, MW-426S/I, MW-431I, MW-531, MW-537, MW-603D, MW-604D, MW-604S, and MW-605D) on Lots 325, 489, and 501. LNAPL and DNAPL recovery will also be performed at ten (10) new shallow and deep recovery well pairs installed in the stone collection trench on Lots 325, 489 and 501. NAPL gauging and recovery activities will initially be performed monthly, subject to a reduced frequency upon RIDEM approval.

9. Groundwater samples shall initially be collected from fourteen (14) monitoring wells (MW-201, MW-216, MW-218, MW-219R2, MW-423S, MW-431S, MW-507 and seven compliance monitoring wells to be installed on the downgradient side of the stone collection trench on Lots 325, 489 and 501), on a quarterly basis for a minimum of two (2) years, and then subject to a reduced frequency upon RIDEM approval. All groundwater samples shall be laboratory analyzed for volatile organic compounds (VOCs).
10. The number of monitoring wells subject to NAPL gauging and recovery activities, and/or groundwater sampling and analysis, may be adjusted up or down depending upon gauging trends and sampling results. Monitoring wells that were subject to NAPL gauging and recovery activities, but which no longer have detectable NAPL, shall be subject to groundwater sampling and analysis for a minimum of three (3) consecutive rounds, in accordance with the Department approved groundwater monitoring schedule, to evaluate groundwater quality and determine the necessity of continued groundwater sampling and analysis.
11. Status reports with NAPL gauging and recovery data and current laboratory analytical results, as applicable, will be due monthly at the OWM for review within thirty (30) days of each sampling event.
12. Results of all environmental sampling shall be sent to Joseph T. Martella II, Office of Waste Management, 235 Promenade Street, Providence, RI 02908.
13. National Grid or a future Performing Party may request an alteration of the NAPL gauging and recovery frequency, groundwater compliance sampling frequency, or status report submittal frequency. All requests must be submitted in writing to the Department, and are subject to final Department review and approval.
14. All excavated regulated materials shall be temporarily placed in working stockpiles and staged on a minimum of two (2) layers of 10-mil polyethylene sheeting in a designated soil management area, or stored in lined roll-off type containers. No excavated materials shall be placed directly on the ground surface. At the end of each work day all stockpiles shall be covered with 10-mil polyethylene sheeting to control the generation of wind-blown dusts and potential sediment migration. Stockpile areas shall be equipped with appropriate controls to limit the loss of the cover and protect against storm water erosion, including the

installation of hay bales, silt fencing and any other appropriate measures during the entire duration of the project. Stockpiles shall be inspected daily by site personnel. Should tears or punctures be observed in either the polyethylene sheeting covering or underlying the piles, repairs shall be made immediately. Daily shutdown procedures shall include the covering and securing of all stockpiled material with polyethylene sheeting.

15. All excavated regulated soil, if not encapsulated onsite, shall be disposed of off-site at an appropriately licensed disposal facility in accordance with all local, State, and Federal laws. Copies of the material shipping records and manifests associated with the disposal of the material shall be included along with the Closure Report.
16. The OWM no longer requires the submittal of analytical data prior to clean fill being brought to a Site. It is the sole responsibility of the Performing Party and their consultant to analyze the material, certify that the material meets the Department's Residential Direct Exposure Criteria (RDEC), as defined by the Remediation Regulations, for all constituents, and is suitable for use on the Site. The OWM strongly suggests that enough representative samples of the clean fill are collected prior to moving the material to the Site to satisfy the Performing Party and their consultant that the material meets the RDEC. Please note that the OWM reserves its rights to sample the clean fill, if suspect, to confirm compliance with the RDEC.
17. All regulated soil remaining onsite shall be encapsulated by an engineered control consistent with those described in the Department approved RAWP.
18. Dust suppression techniques (i.e. watering) and/or odor suppression shall be employed as necessary during all soil disturbing/handling activities at the Site in order to minimize the generation of fugitive dust and control odors.
19. The OWM shall be immediately notified of any Site or operation condition that results in non-compliance with this Order.
20. Any interruptions of the remedy shall be reported to the OWM's Joseph T. Martella II by telephone within one (1) working day and in writing within seven (7) days of occurrence.
21. All waste derived from installation and operation of the remedy shall be disposed of in accordance with the RAWP, the Department's Rules and Regulations for Hazardous Waste Management, the Rules and Regulations for Composting Facilities and Solid Waste Management Facilities, and the Regulations for the Rhode Island Pollutant Discharge Elimination System, as well as any other applicable local, State, or Federal regulations and policies. Documentation of proper disposal shall be provided to the OWM.
22. This Order does not remove National Grid's obligation to obtain any other necessary permits from other local, State, or Federal agencies.
23. National Grid shall have this Order recorded in the City of Providence Land Evidence Records for the subject property within thirty (30) days of execution of this Order and prior

to any remedial activities. A copy of the recorded Order (stamped with the book and page number) must be submitted to the Department within fifteen (15) days of recording.

24. Within sixty (60) days of completion of the work described in the Department approved RAWP, a Closure Report detailing the remedial action, current Site status, groundwater gauging and monitoring results, and all disposal documentation shall be submitted to the OWM.
25. Within thirty (30) days of receiving Department approval of the Closure Report, National Grid shall have the Department approved ELUR recorded in the Providence land evidence records for the property, and a stamped, certified copy shall be returned to the Department within fifteen (15) days of recording. Upon receipt of a copy of the recorded (stamped) ELUR, the OWM will issue an Interim Letter of Compliance for the terrestrial upland portion of the Site.
26. Based upon the results of groundwater monitoring, the Department reserves its rights to require additional remedial actions or monitoring at the Property to achieve final compliance at the Site, if warranted.
27. No hazardous waste shall be accepted from any off-site sources for treatment, storage or disposal at the Site.
28. Closure and removal of the remedial system(s) at the conclusion of the remedy will be contingent upon final Department approval.

Please be advised that this Order is limited to the remediation of the terrestrial upland portion of the Site, and does not preclude additional investigation and/or remediation activities related to sediments impacted by historic or ongoing releases of hazardous materials at or from the Site.

This Order shall remain in full force and effect provided said RAWP is implemented in a manner satisfactory to the Department of Environmental Management. Failure to comply with all points outlined in the Department approved RAWP and stipulated in this Order shall result in the revocation of this Order of Approval and may result in the issuance of a Notice of Violation against the Responsible Parties.

This Order shall be subject to modification or revocation in accordance with law.

Entered as the Order of the Department of Environmental Management this 9<sup>th</sup> day of May, 2013.

By:



Matthew D. Destefano  
Deputy Chief, Office of Waste Management  
Department of Environmental Management