BOSTON GROUNDWATER TRUST (BGwT)
BOARD MEETING
September 15th, 2016

The Board of Trustees of the Boston Groundwater Trust held its meeting in the Patriots Room at the Lenox Hotel located at 710 Boylston Street. The Executive Director electronically distributed meeting notice and agenda to the City Clerk at Boston City Hall in accordance with the provisions of the Commonwealth of Massachusetts' Open Meeting Law. Mr. Mitchell, co-chair, called the meeting to order at 4:05 pm. The following trustees were present:

Mr. Tim Mitchell, Neighborhood Association of the Back Bay
Mr. Gary Saunders, Boston Back Bay Association
Mr. John Hemenway, Beacon Hill Civic Association
Ms. Janine Commerford, Greater Boston Real Estate Board
Mr. Greg Galer, the Boston Preservation Alliance
Mr. Austin Blackmon, Chief, Office of Environment, Energy, & Open Space

Also present:

Mr. Christian Simonelli, Executive Director; Mr. Patrick Lyons, North End/Waterfront Neighborhood Council; Ms. Kathryn Bell, Neighborhood Liaison at the Office of Boston City Councilor Josh Zakim; Mr. Joshua Fiedler and Mr. Seth Wiseman, Project Team LightWell; Mr. Len Singer & Mrs. Elissa Singer, residents of Back Bay; Mr. David Zucker, resident of Back Bay; Mr. Samuel Perry, resident of Back Bay; Mr. James Comeau, P.E., Senior Project Manager at Bryant & Associates; Julie Wood, Charles River Watershed Association.

1. Adoption of the minutes of the July 11th, 2016 Meeting

Minutes were previously emailed to Board members for review. Discussion followed. Mr. Saunders, co-chair, moved to adopt the minutes. Mr. Hemenway, Trustee, seconded the motion. Mr. Galer, Trustee, abstained.

Voted: To accept the minutes of the July 11th, 2016 meeting.

2. Financial Report

Mr. Hemenway reviewed the BGwT's financial reports. Mr. Hemenway noted an apparent discrepancy in the balance sheet related to funds received from the City of Boston. Discussion followed. Mr. Simonelli noted that he invoiced the City for the Trust's annual funding and that QuickBooks automatically added the invoiced amount to all financial reports. Discussion followed. Mr. Hemenway and Mr. Simonelli will meet to further clarify the discrepancy and report back to the Board at the November meeting.

3. Open Meeting Notice Protocol

Mr. Simonelli reviewed the procedure for posting notice of upcoming board meetings. He noted that the Commonwealth's Open Meeting law now requires all public entities to include the meeting agenda in addition to meeting location, date, and time. Discussion followed. Mr. Simonelli noted that he spoke with Ms. Maureen Feeney, Boston City Clerk, and she confirmed that, going forward, Board Meeting notices must include the agenda. Discussion followed. At a prior Board Meeting, Mr. Hemenway had requested that Mr. Simonelli obtain a written copy of the protocol from the Boston City Clerk.
Mr. Simonelli stated that he has received confirmation from Ms. Feeney in the form of email that the Trust is following the correct protocol to comply with the Commonwealth's Open Meeting Law. Discussion followed. Mr. Simonelli noted that Board by-laws pertaining to Open Meetings must be updated to bring them into compliance with these recent changes to the Commonwealth's Open Meeting law. Mr. Simonelli reviewed the following proposed revision to by-law language under Article 11 Open Meetings:

Original Language
The Trust shall comply with the Open Meeting Law in accordance with the requirements and procedures of G.L. 30A, §11A.5.

Proposed Revision
The Trust shall comply with the Open Meeting Law in accordance with the requirements and procedures of G.L. c.30A, §§18-25 and any repeals or edits going forward.

Discussion followed.

Mr. Saunders moved to adopt the above proposed revision to by-law language under Article 11 Open Meetings, Mr. Galer seconded the motion.

VOTED: To adopt the above proposed revision to by-law language under Article 11 Open Meetings.

4. Update on LightWell Project by Seth Wiseman and Joshua Fiedler

Mr. Wiseman and Mr. Fiedler provided an update on the progress the team has made since last presenting to the Board in May. Discussion followed.

- The display for the large touch screen with historic BGwT groundwater level data is completed and it may be possible to move it into the AutoDesk space sometime next week. The display for the observation well and hand pump simulator is also completed.

- The prototype of the cap and casing were presented to the Board. The electronics setup and security strategy were reviewed.
- The LightWell team confirmed the ability of the in-well datalogger to communicate with the microcontroller built into the well cap. This function enables the groundwater level readings collected by the datalogger to be displayed on the top of the well cap. The team also confirmed the ability to control the display, permitting a timed operation to conserve battery life.
- Caps will have crowd sourcing functionality through Bluetooth to engage the public in data collection, and bring awareness to the groundwater issues. The Lightwell team hopes to leverage cell phones to crowd source the transmission of daily data to the Trust. An app will be developed and available through the app store for download.
- Next steps will be to perform an environmental test of the cap to ensure there are no leaks or malfunctions in cold weather or high humidity. The project team plans to conduct these tests at AutoDesk's environmental lab once the South Boston AutoDesk office space is completed.
- The cap will also be installed (short-term) in an existing BGwT well to make sure it fits correctly.
- At the May meeting the proposed total Trust contribution was estimated to be $20,000. New total is $21,100. (Refer to attached presentation and budget.)
    - The $1,100 increase reflects the cost of purchasing two sets of rechargeable batteries for the microcontrollers. (One set serving as a backup.)
    - Charged batteries are predicted to last for one month.
- Deployment into well caps is tentatively scheduled for Spring 2017, pending the successful beta-testing of the well caps and a public outreach and review process.
- A question and answer session followed the presentation.

5. <u>Presentation by Julie Wood of the Charles River Watershed Association (CRWA) on the construction & performance of Porous Alley No.543</u>

Mr. Mitchell, co-chair, provided a background on the Trust's partnership with the CRWA and the City on the porous alley project. Julie Wood (Director of Projects) at the Charles River Watershed Association updated the Board on the following:

- Review of partnership, funding, and design of the alley.

- Project goals and site selection.
- Public outreach efforts and the construction process
  - Consulted with the Boston Architectural College on their experience with the porous alley no. 444 project.
  - Delays encountered during construction to have utilities moved which were not discovered until construction commenced.
- Results of monitoring thus far have indicated that water is percolating very well.
- Groundwater levels in a monitoring well within the porous section of the asphalt have been measured regularly since the alley was installed in 2014.
  - No overflow has ever been recorded in the overflow pipe
  - Readings indicate that the water depth in the storage reservoir has not exceeded more than about 8 inches, which is still almost a foot below the underdrain pipe per the system design.
- Overall post-construction groundwater levels were approximately 0.50' foot higher that pre-construction groundwater levels.
- Overall the porous alley is effectively infiltrating stormwater
- The alley's performance is also comparable to other porous asphalt systems in New England
- If properly maintained by twice-yearly vacuum sweeping, the alley should continue to provide improved stormwater infiltration for years to come.

Upon completion of her presentation Ms. Wood opened up a question and answer session to the Board. Discussion followed. Refer to the attached presentation for additional details.

6. <u>Executive Director's Report</u>

BGwT Executive Director Mr. Christian Simonelli distributed his report. Discussion followed. Refer to the attached *Executive Director's Report: September 15th, 2016* for a complete list of activities.

The meeting adjourned at 6:20 p.m.

NEXT MEETING: November 15th, 2016 @ 4:00 pm at the Lenox Hotel.
Notes submitted by Christian Simonelli, BGwT Executive Director, on 9/20/2016.

J. Commerford, Secretary - Approved 4 October 2016

EXECUTIVE DIRECTOR'S REPORT
September 15th, 2016

1. **Readings –** I have hired new well reader and we started reading our 8th set of readings of the year.
2. **Meetings –**
    a. I met with John Holland and Paul Baccala of the Holland Company to review their changes for the 46 Wareham Street project in the South End (7/28).
    b. I met Neighborhood Association of the Back Bay's president Sam Wallace about groundwater levels in the vicinity of Fairfield and Beacon Streets (8/31).
    c. I was interviewed by Christian Bergeron of the Boston Guardian about the current drought and its potential effects on woodpiles (8/5).
    d. I was interviewed by Beth Treffeisen of the Beacon Hill Times about the current drought and its potential effects on woodpiles (8/22).
    e. I was interviewed by reporter Doug Cope of the WBZ Radio about the current drought and its potential effects on woodpiles (8/24).
    f. I was interviewed by meteorologist Michael Page of New England Cable News about the current drought and its potential effects on woodpiles (8/24).
    g. I attended scoping sessions for the 46 Wareham Street project (8/9) and the General Electric Headquarters project (8/10).
    h. I presented to the Inspectional Services Department Commissioner Christopher, plans examiners, and various staff. The presentation focused on the work of the Trust, GCOD, and the importance of ISD's role in plans review process (9/7).
    i. I spoke and met with residents throughout the GCOD to discuss ZBA procedures and advised them on what they need to provide us to satisfy the zoning.

3. **MBTA** - Approximately 46 gpm is being injected into recharge wells in the area. In addition to our manual monitoring we have 4 wells in the area with dataloggers recording a water level every 60 min. Levels in the Appleton & Tremont Street area are lower than what was projected. Along with the MBTA's Engineer (GZA Geo-Environmental) I coordinated with BWSC and ISD for entry into 1 Appleton Street. We discovered a sump pump system was originally installed to prevent periodic flooding in the parking garage. However, the building manager indicated that the sump pump system is no longer necessary because flooding of the basement has not occurred since a new storm drain system was installed near the entrance of the parking garage about 15 years ago. The recommendation from ISD and GZA is that the sump pump system is filled with concrete or be permanently removed.
4. **Porous Alley 543** - We continue to datalog two wells in Porous Alley No. 543. A final report received in mid-July from CRWA stated the following:
    a. Every well had a statistically significant increase in the post-construction time period relative to the pre-construction time period. Most of the wells also had a statistically significant relationship with precipitation.
    b. If properly maintained, the alley should continue to provide groundwater storage and water quality benefits for years to come.
    c. Adequate storage has been provided for all storm events
    d. Alley's performance is comparable to other porous asphalt systems in New England
5. **DCR –** The Storrow Drive Tunnel pump station system is operating as anticipated. Discharges in both pumps to the east and west have equal run times and are showing no anomalies. The low levels to the west of Berkeley Street along the Back Street have come back up and are stable. DCR coordinated with BWSC, inspected the infrastructure, and found no issues. I am not sure what caused the drop. I have installed 3 dataloggers in the wells that dropped to see if this occurs again. Internally within the next 6 months the DCR will look at underpass repairs and start to form a plan for what's next. Recharge will be part of the plan and will be looked for possible upgrade.

6. **BWSC –** An update of the following:

a. Manholes along Fairfield Street by Beacon Street were inspected but no infiltration seen. Back Street manholes were also inspected and there may be some infiltration. BWSC is actively inspecting all of their low infrastructures in the area. Dye tracer tests are being conducted in our wells both yesterday and today.
b. Entry into the North End buildings along Commercial Street is being coordinated with ISD. BWSC will accompany ISD personnel to inspect buildings and check for sump pumps and laterals.
c. A TV inspection of pipe along Richmond Street initially revealed what appeared to be a leak by the low well (25L-1586). However, additional TV inspection at the corner of Richmond and Commercial revealed no infiltration. BWSC will continue to investigate. Pipe in question is at a low level elevation.
d. Along Clarendon, Gray, & Appleton Streets there were no signs of infiltration. CCTV inspection scheduled in the next couple of weeks.
e. Sewer lines and manholes in the area of Appleton and Tremont Street's will be inspected.
f. Alley No. 430 work is setup to design and a contract will be bid in the Autumn of 2016, with construction is anticipated to occur in mid-2017.
g. In the Stuart Street area between Berkeley and Dartmouth Streets steam lines are causing an issue for inspections. BWSC is coordinating with Veoila to help in accessing lines.

7. **MWRA** - Inspected the Boston Marginal Conduit (BMC) at the beginning of September. The initial review of the inspection showed there were only very minor signs of infiltration at a few spots during the inspection. None of which is significant enough to cause the lowering of the groundwater in the area of Fairfield and Beacon Streets. The inspection tapes will be reviewed later this week and a report will be forwarded to the BGwT.
8. **MassDOT** - Additional inspection and repairs of the 30" portion of the Prudential Tunnel drain line is scheduled for later this month. So far wells in the area have shown a slight increase is response to the previous repairs that were made in early January.
9. **Veolia Energy** - The Copley Square Public Library and other smaller steam customers are still being investigated as possible locations. Veolia submitted data to DEP on discharge content. The permitting process was vetted and will be completed without any issues.
10. **Opportunity for Trustee Site Visit** – I have arraigned for those Trustees who are interested to observe test pit work and pile installation work on an upcoming project in mid-October. I'll provide additional details as we zero in on a date and time.
11. **Website** - I have added some new content to our website. Articles have been written and news interviews have been conducted about the recent drought and its potential effect on wood piles. The most recent items are posted under the *"Latest News"* tab on our homepage. As always, I would appreciate any feedback you may have.

Remaking water legible

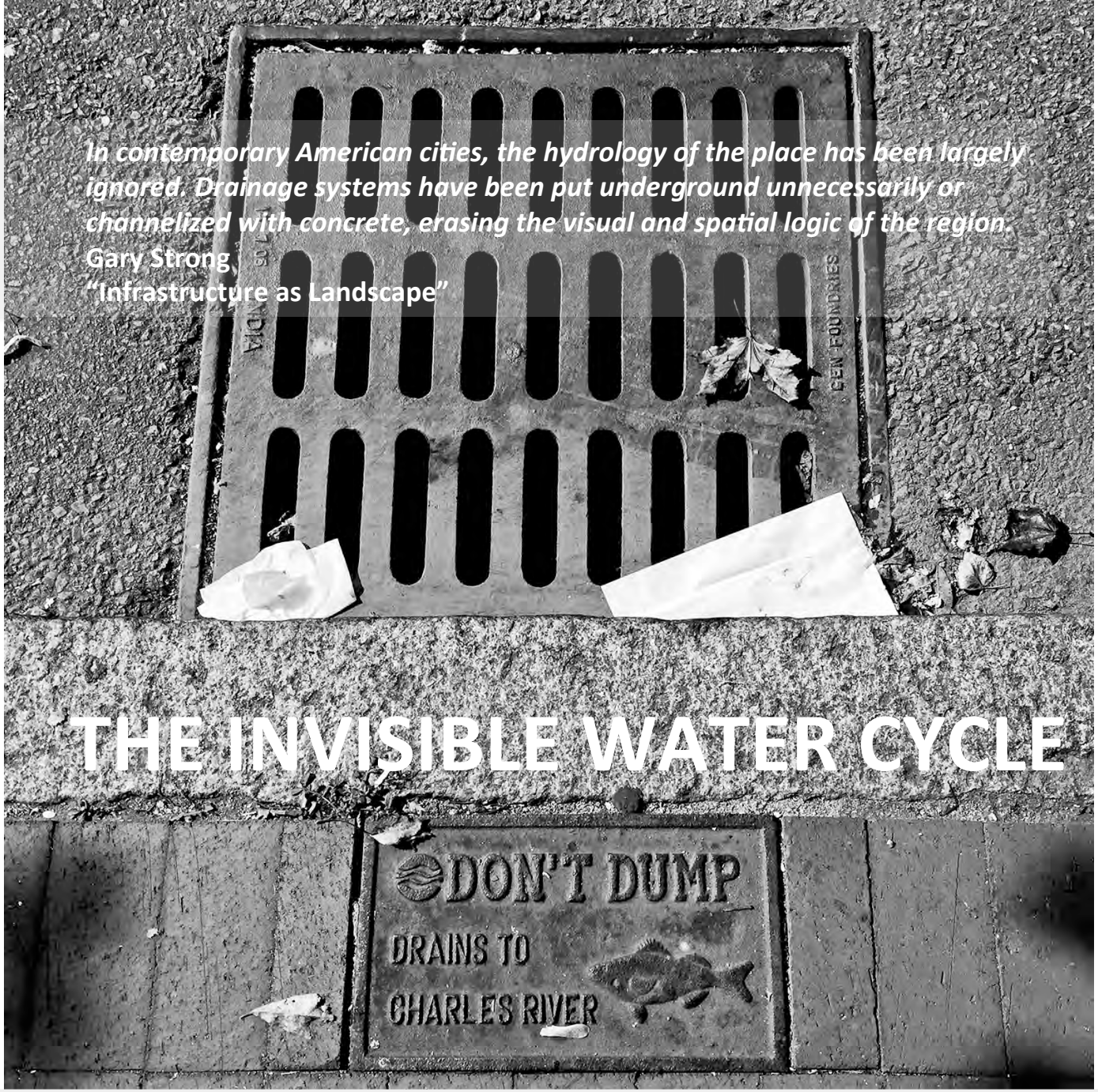
LightWell: prototypes for communicative landscape

Michelle Laboy
Northeastern University
FieLDworkshop

Joshua Fiedler
FieLDworkshop

Seth Wiseman
ConformLab

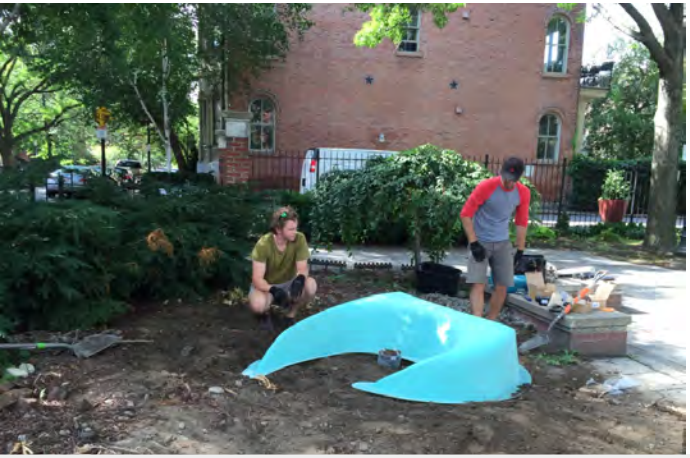
AutoDesk BUILD space grant Boston Ground Water Trust City of Boston Office of New Urban Mechanics

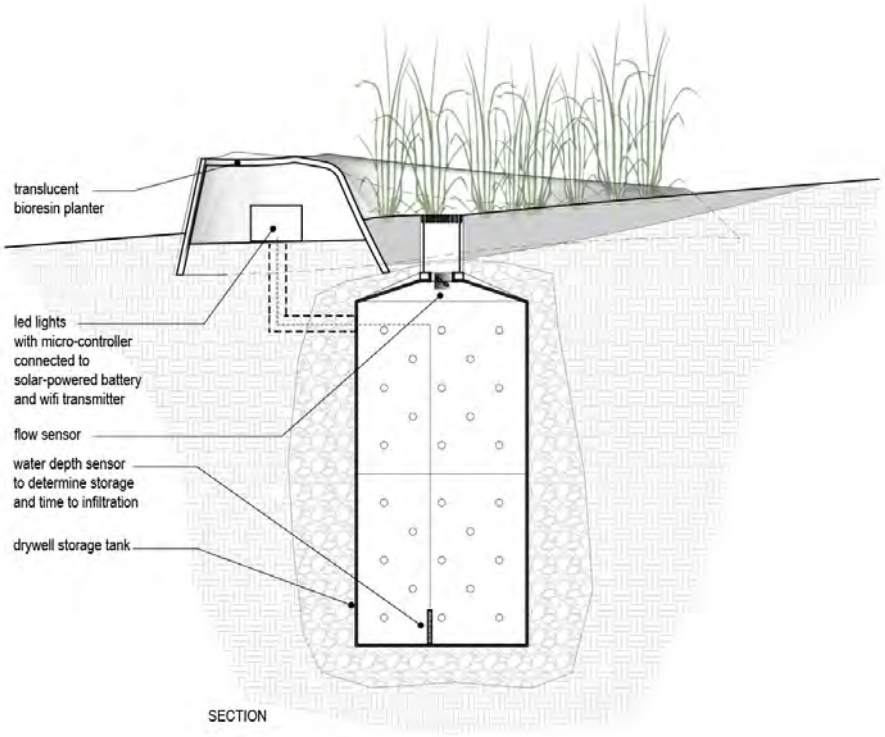


In contemporary American cities, the hydrology of the place has been largely ignored. Drainage systems have been put underground unnecessarily or channelized with concrete, erasing the visual and spatial logic of the region.
Gary Strong,
"Infrastructure as Landscape"

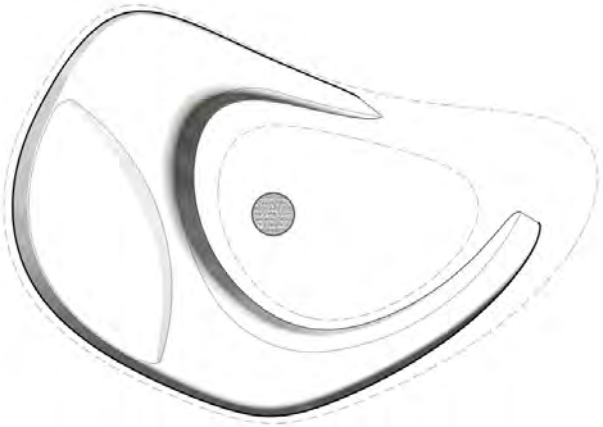
THE INVISIBLE WATER CYCLE

THE MAYOR'S OFFICE OF
NEW URBAN MECHANICS
BOSTON





SECTION



PLAN

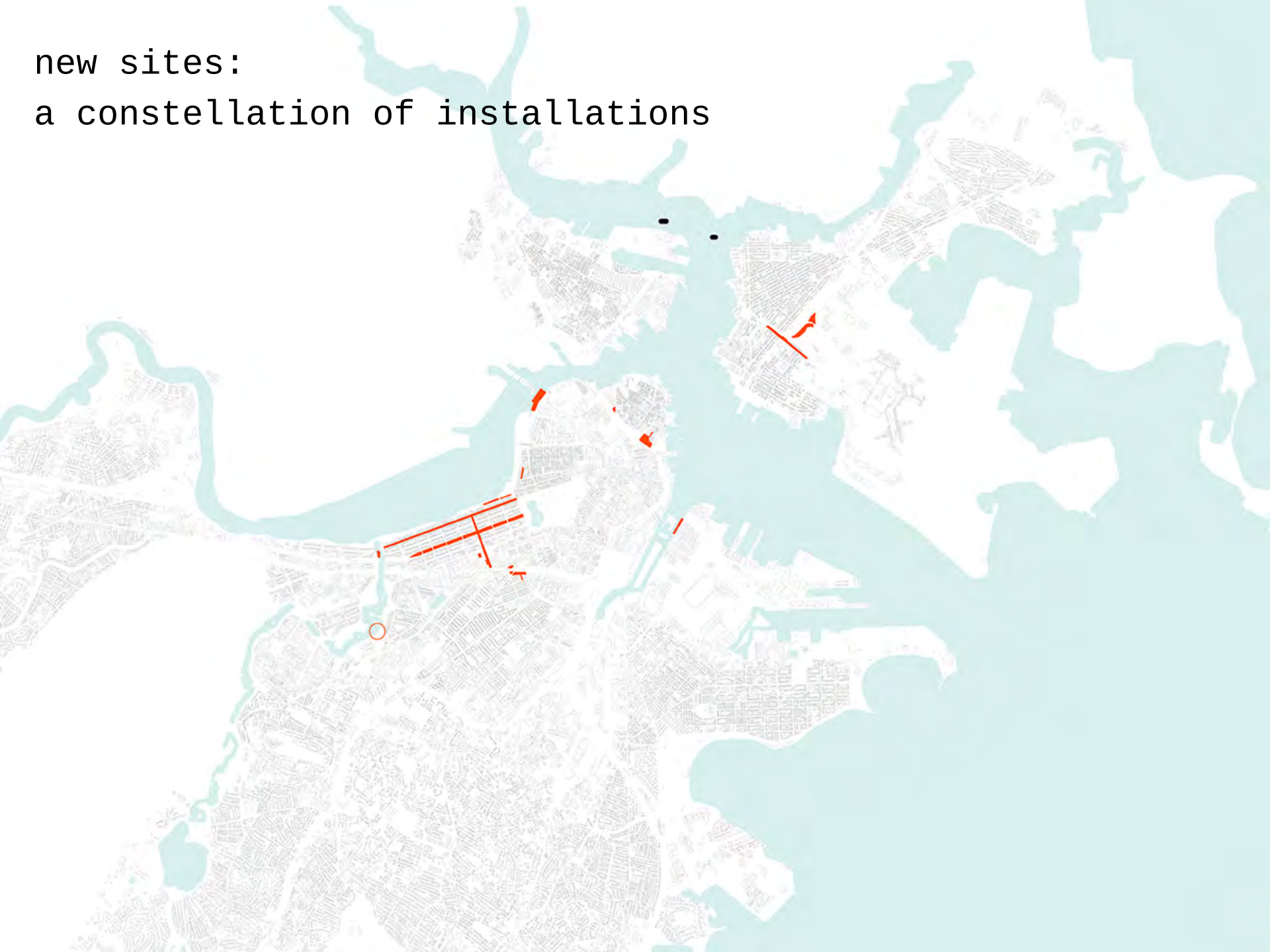

cyan = empty or low level


deep pink = flow

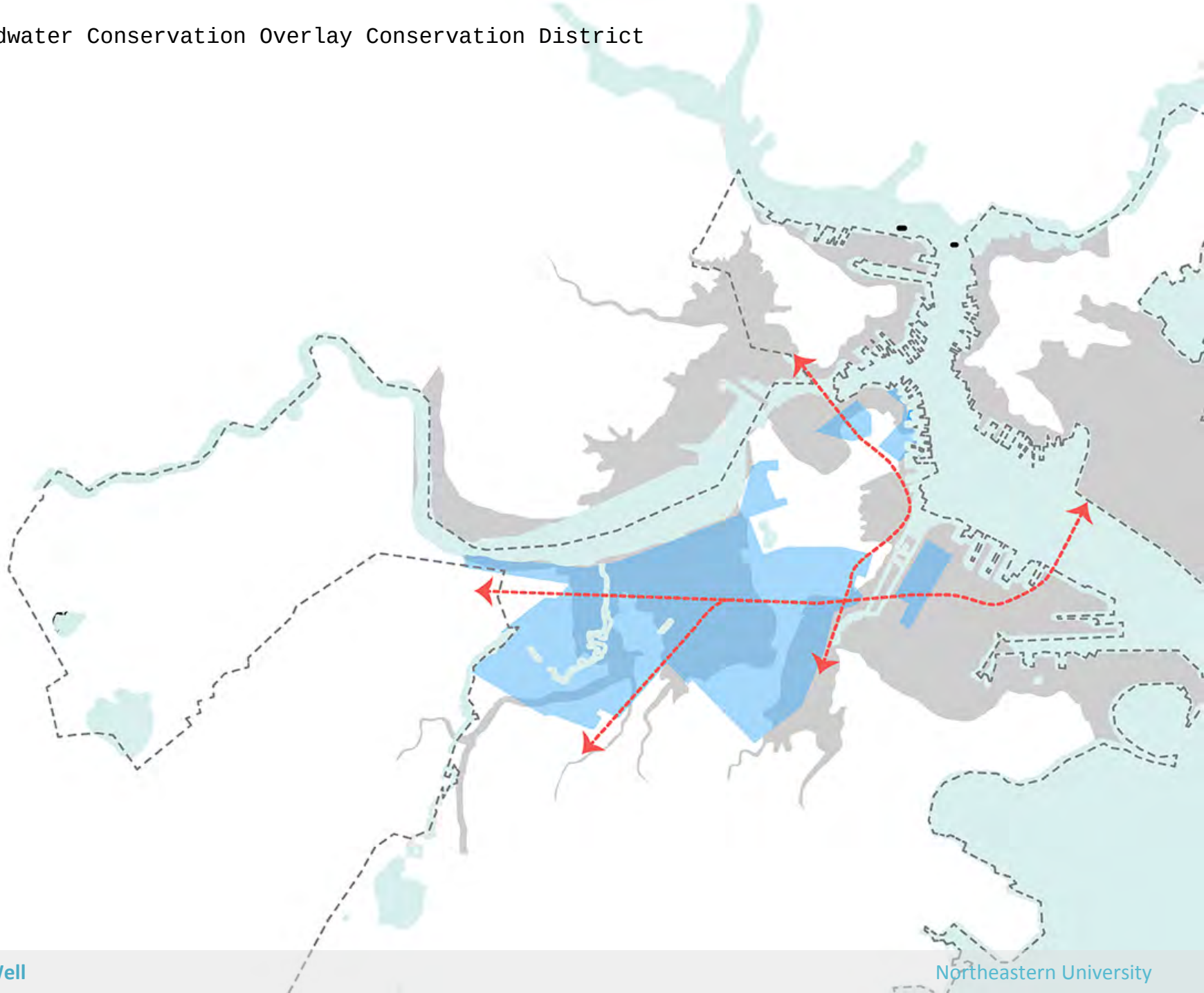

green = medium water level

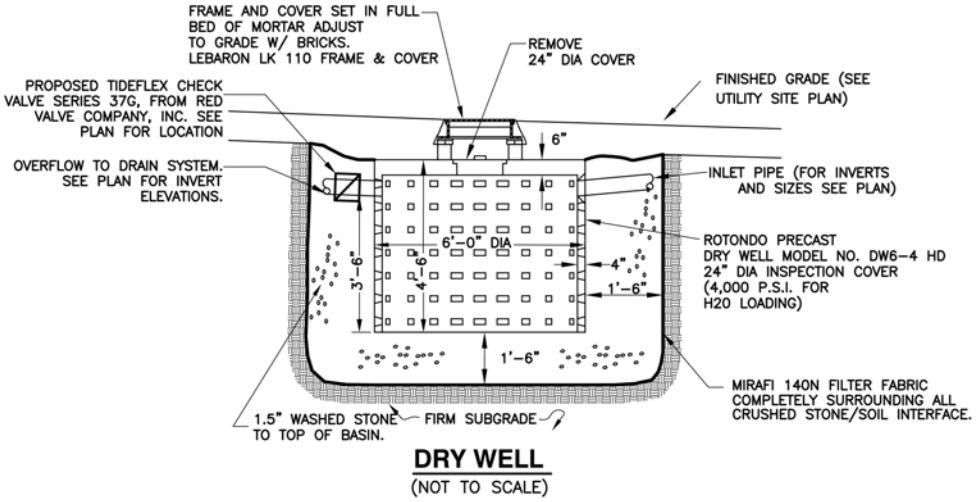

deep pink = flow

new sites:
a constellation of installations



Groundwater Conservation Overlay Conservation District

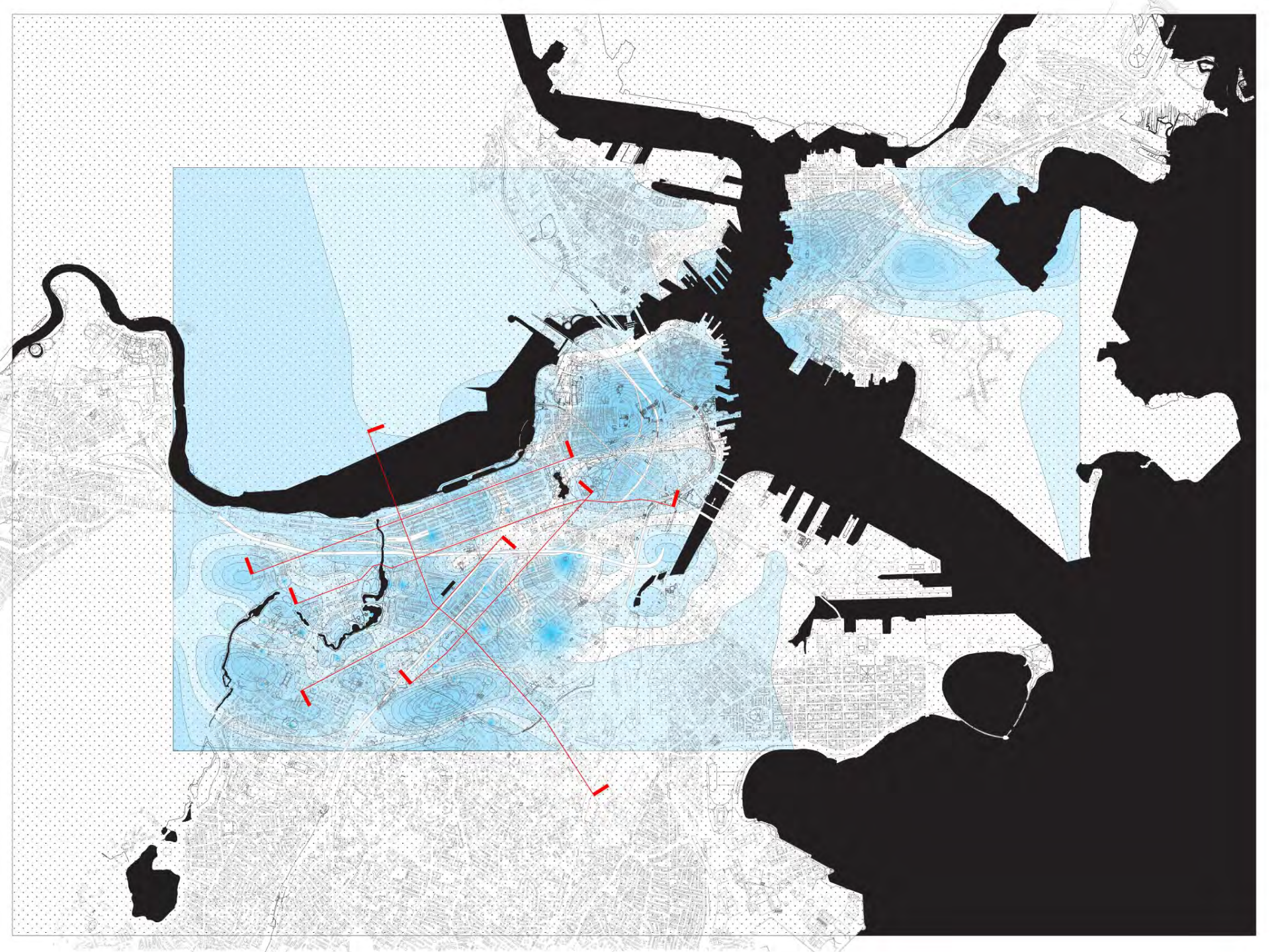


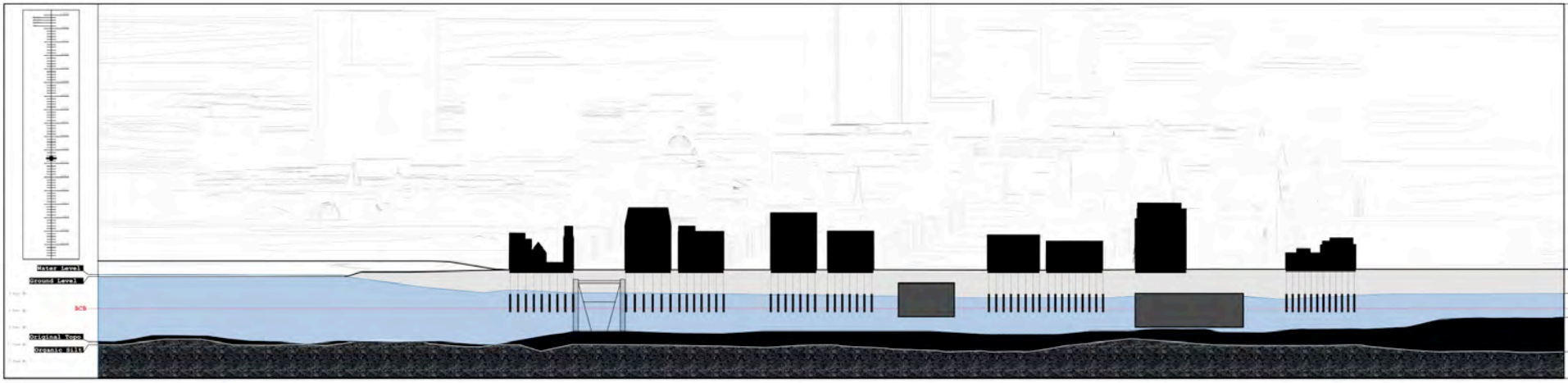


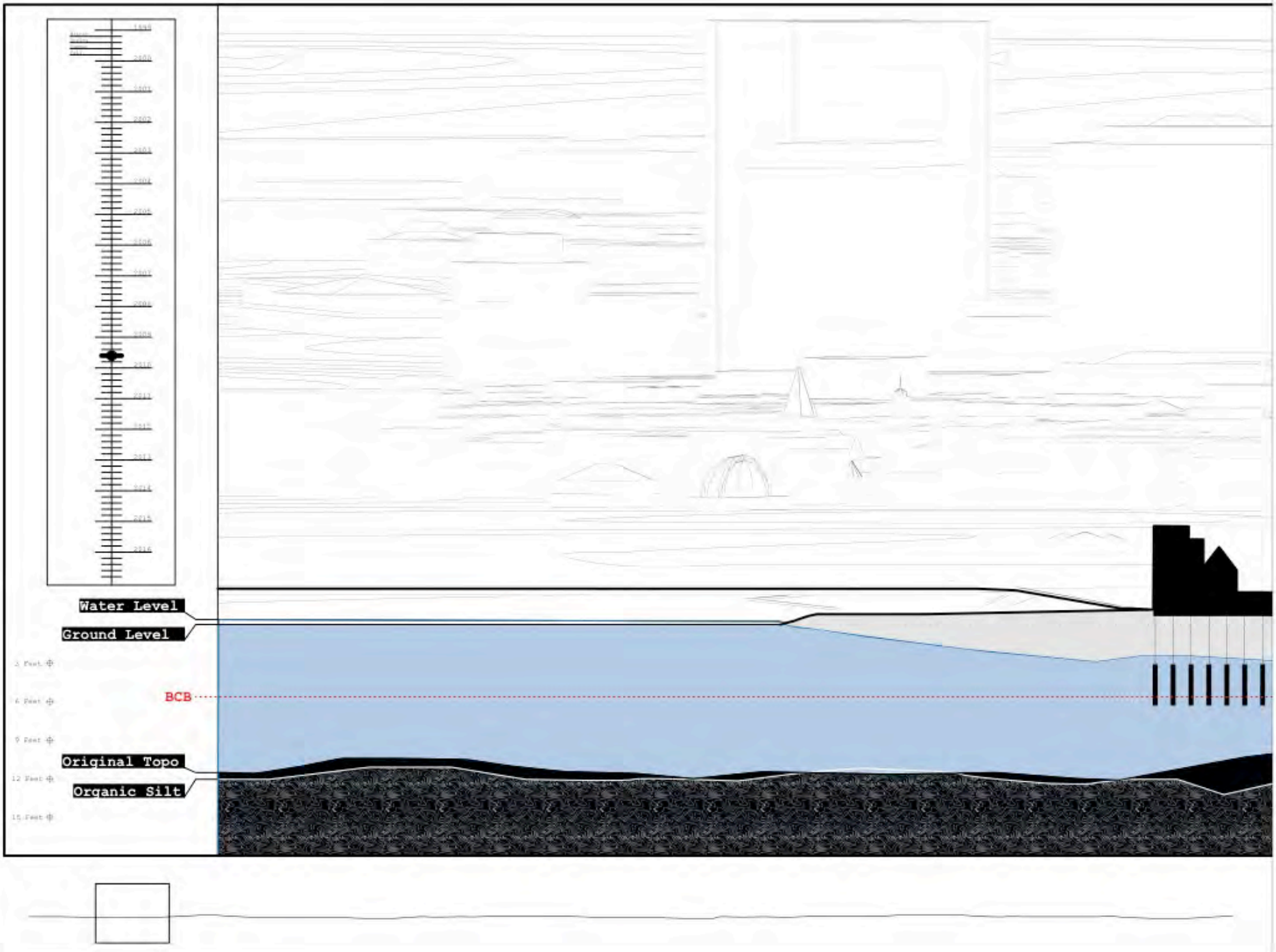
2015

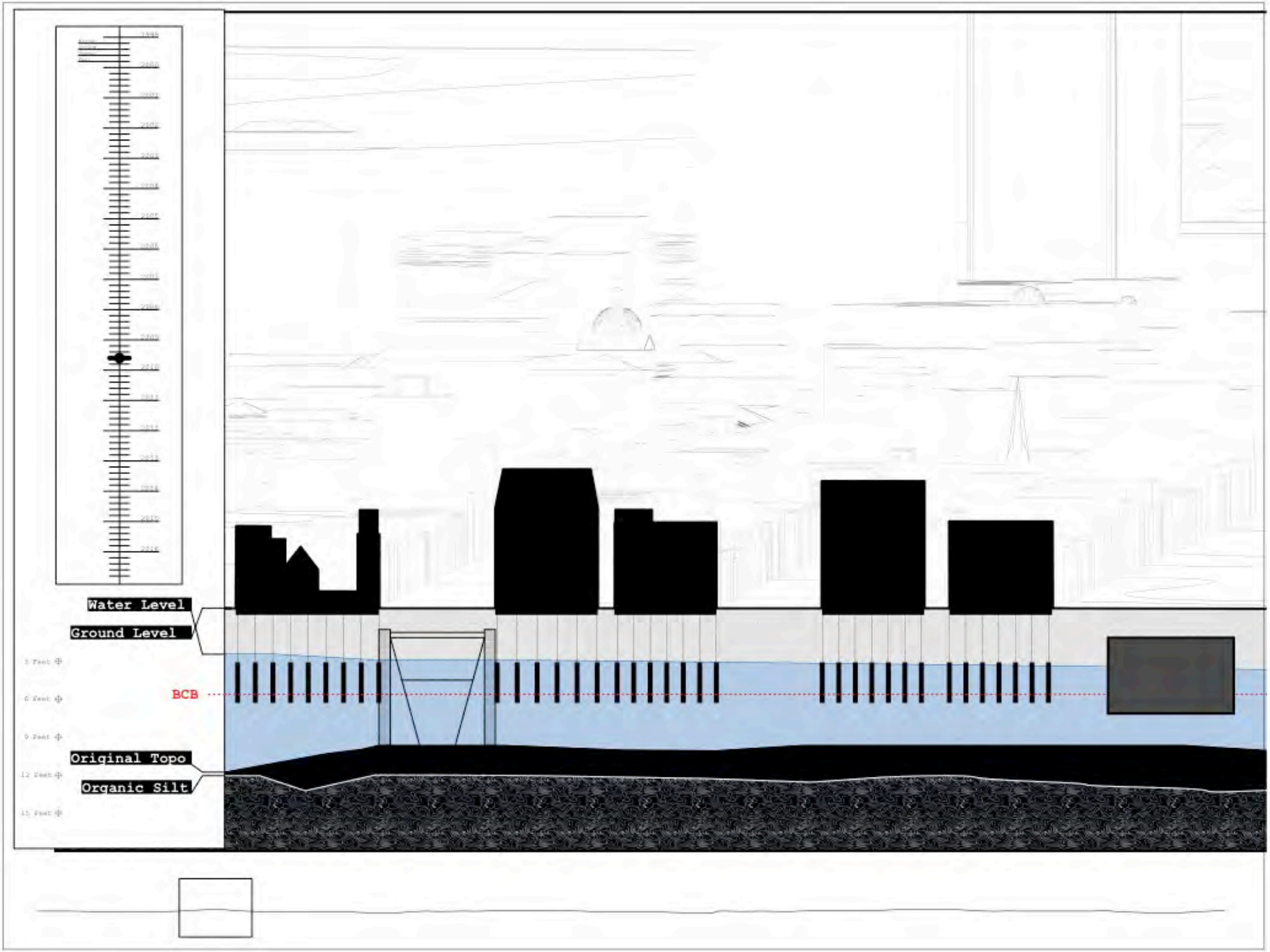
Recharge Stations

Monitoring Boston's Groundwater




Water Level
Ground Level
SCB
Original Toe
Organic Silt

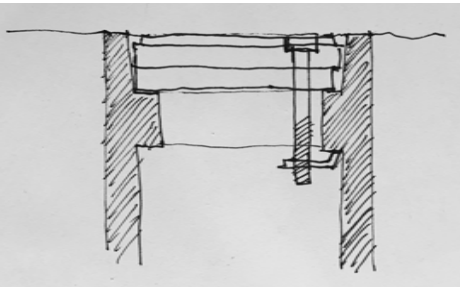

Water Level
Ground Level
3 Feet
6 Feet
9 Feet
12 Feet
15 Feet
BCB
Original Topo
Organic Silt

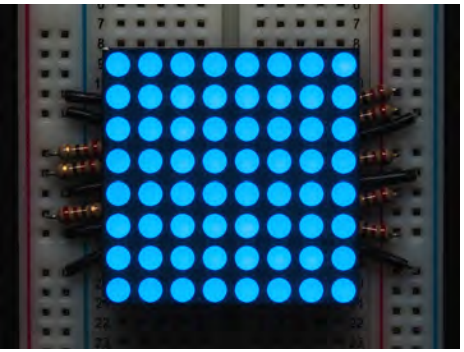

Water Level
Ground Level
BCB
Original Topo
Organic Silt


BOSTON GROUNDWATER TRUST
DO NOT FILL
2003
2004
OBSERVATION WELL


BOSTON GROUNDWATER TRUST
DO NOT FILL
2003
2004
OBSERVATION WELL


BOSTON GROUNDWATER TRUST






Perspective
BOSTON GROUNDWATER TRUST

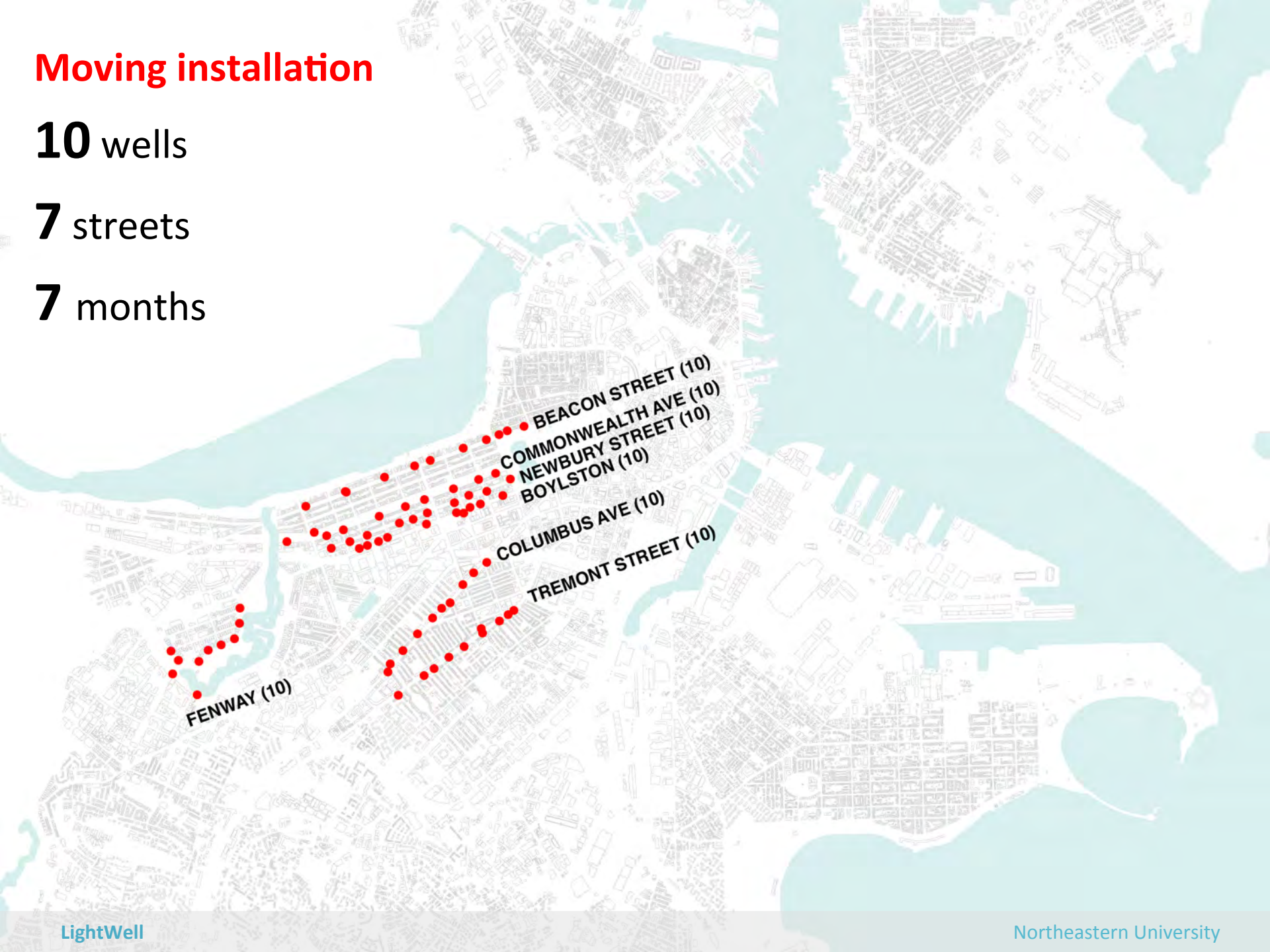

In-Situ Inc.
Level TROLL 700

Moving installation

10 wells

7 streets

7 months

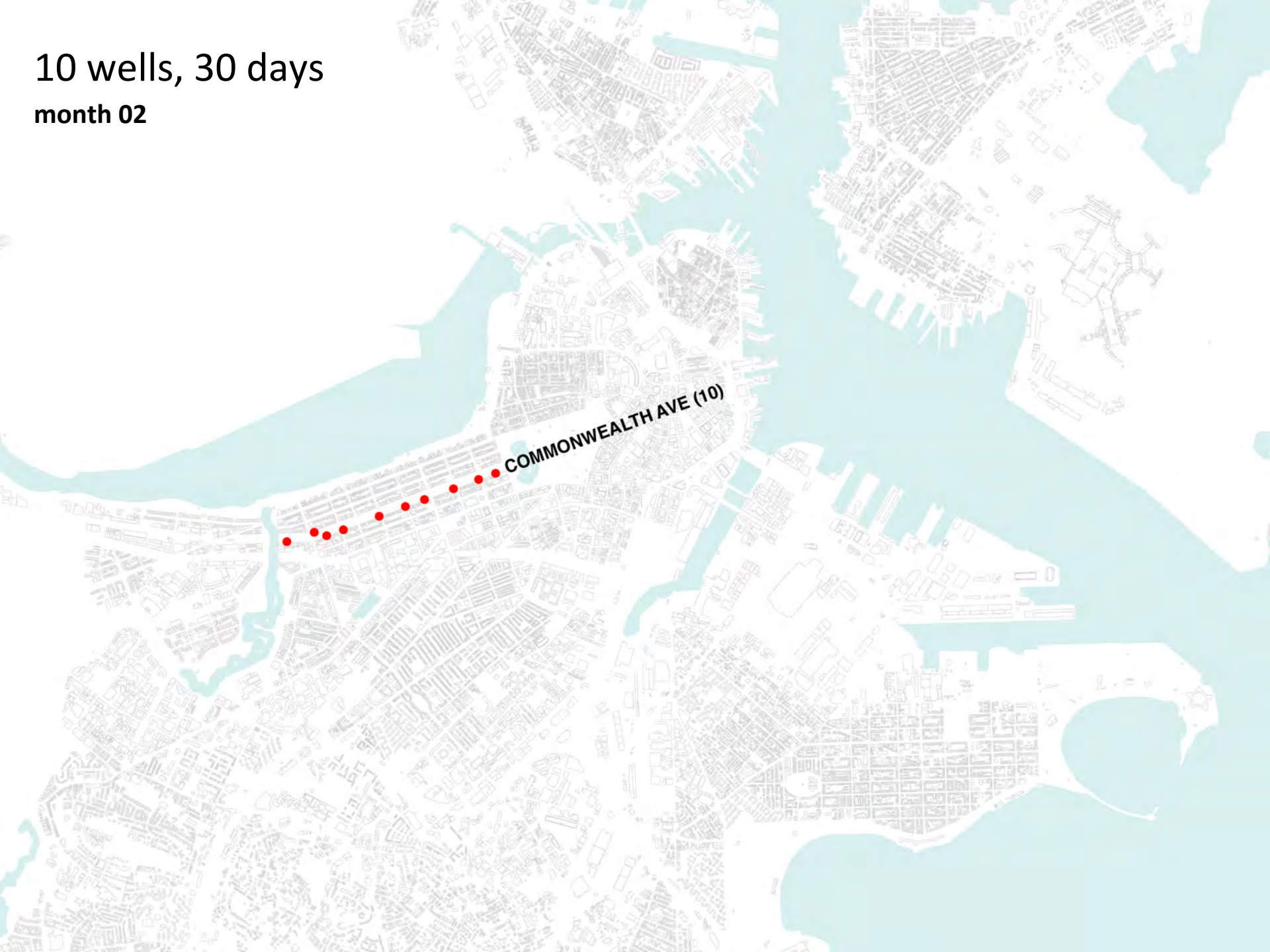


10 wells, 30 days

month 01

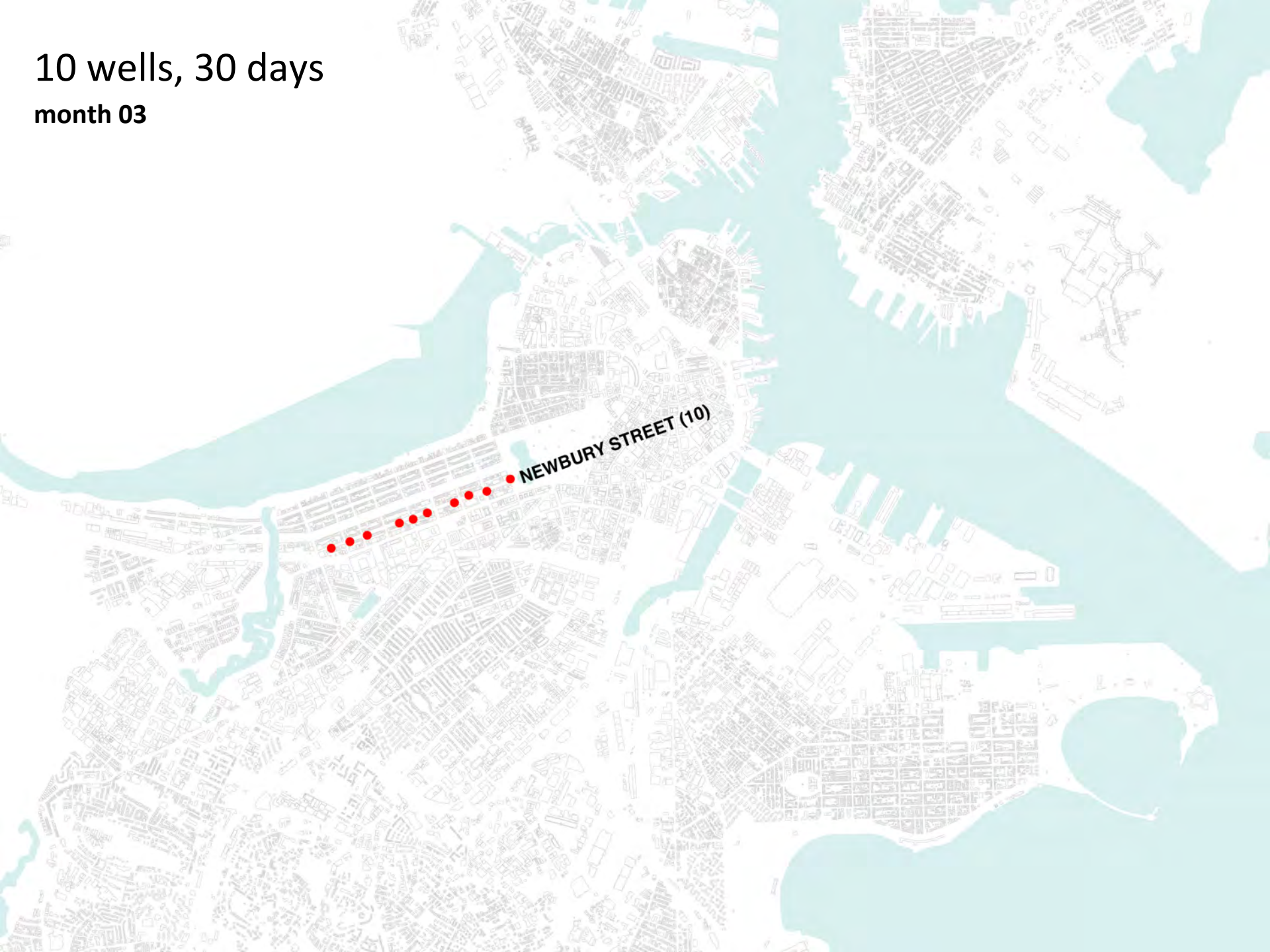
10 wells, 30 days

month 02



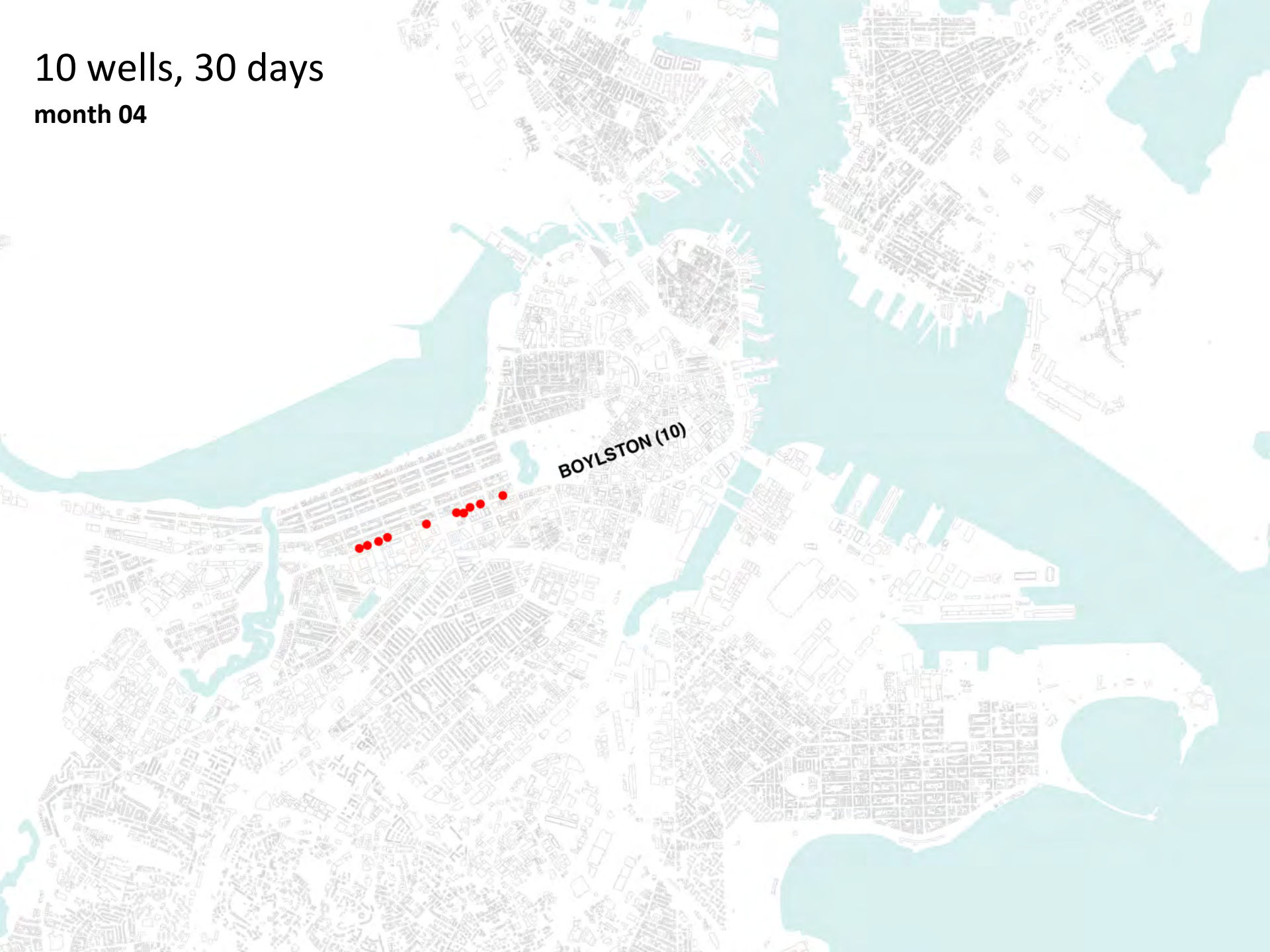
10 wells, 30 days

month 03



10 wells, 30 days

month 04



10 wells, 30 days

month 05

10 wells, 30 days

month 06

10 wells, 30 days

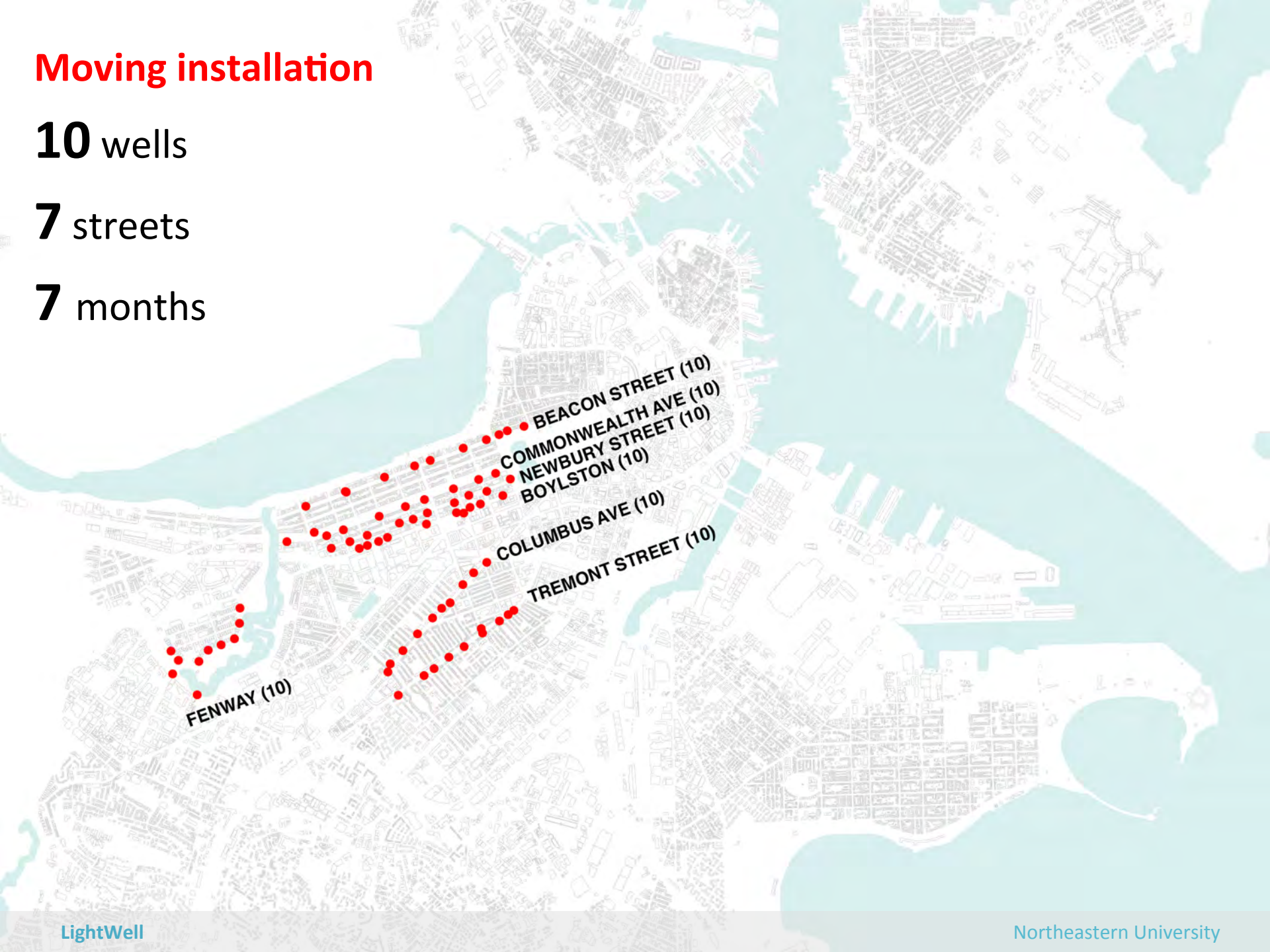
month 07

Moving installation

10 wells

7 streets

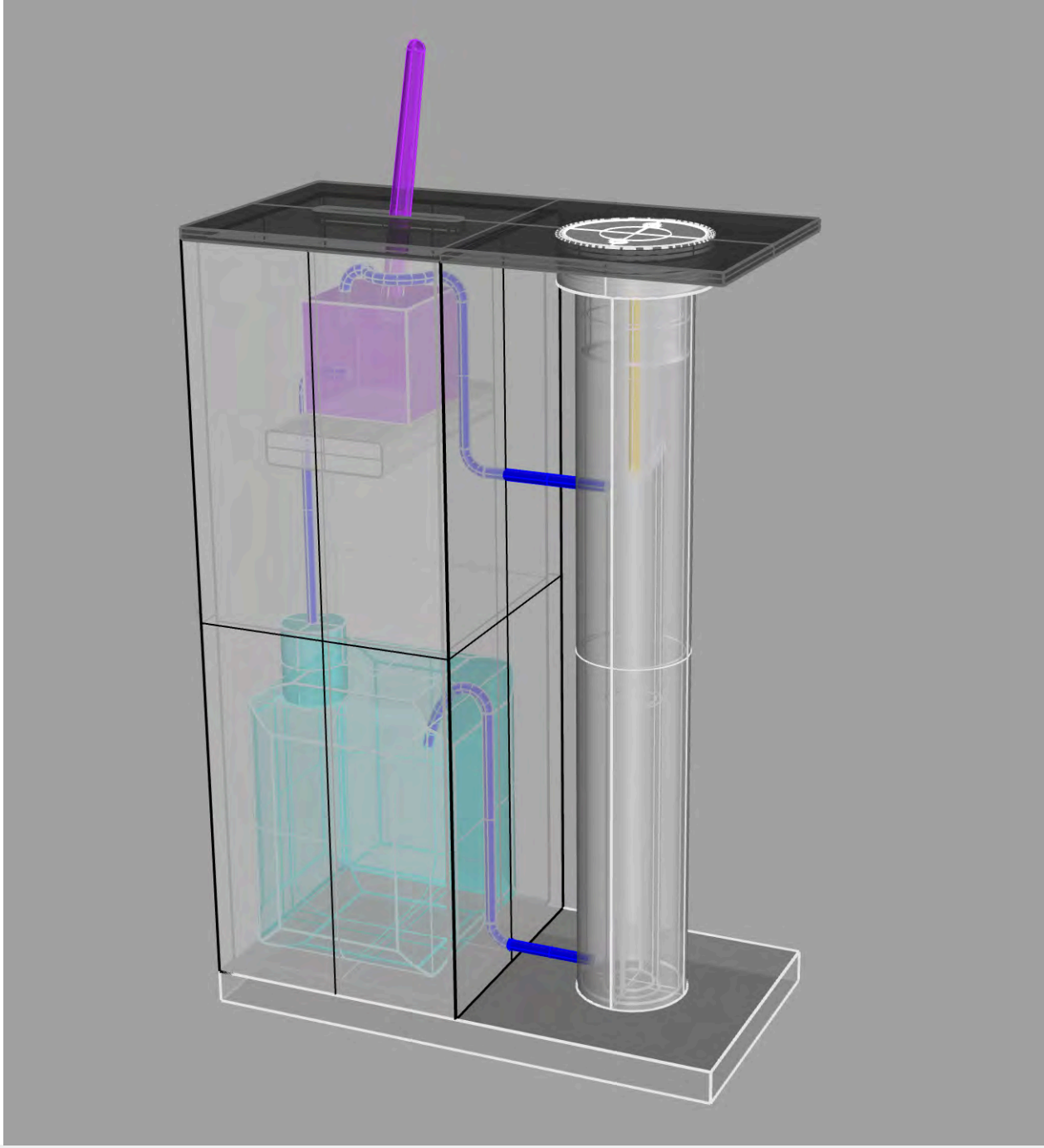
7 months



the importance of PROTOTYPING

PROTOTYPE DISPLAY

Interactive Well Caps



Proposed Budget

Team Funding		Boston Groundwater Trust	
$13,000	Research staff – prototype and installation	$13,000	10x In-Situ instruments (BGwT keeps them)
$1,000	Micro-controllers purchased for prototyping	$1,300	1x In-Situ instrument donated to team for prototype, display and testing
$4,000	Corian, rubber material & well cap fabrication	$5,000	10x micro-controllers (BGwT keeps them)
$6,000	Exhibit: Prototype and digital model displays	$700	LED lights, batteries, including spare batteries
$24,000	**Estimated total covered**	**$20,000**	**Proposed Total BGwT support (Sensors to keep = net $7,000 for display)**

Paving the Way for Green Infrastructure

Boston's Porous Alley Demonstration Project

CRWA

Boston Porous Alley Project

- **Partnership** – Charles River Watershed Association (CRWA), Boston Public Works Department and Boston Groundwater Trust (BGwT) partnered to implement and monitor pilot porous pavement project
- **Funding** - Grant from Mass DEP to CRWA + match provided by City of Boston and BGwT
- **Design/ Engineering** - Vanasse Hangen Brustlin (VHB) Inc.

BOSTONIA CONDITA A.D. 1630.

BOSTON POROUS ALLEY

When it rains, it recharges

Project funded by Massachusetts DEP and designed by Vanasse Hangen Brustlin

Public Alley # 543

Charles River Watershed Association
Boston Public Works Department
Boston Groundwater Trust

Project Goals

- Part of Boston's goal to be a "greener" city
- Help to protect Boston's water resources from stormwater runoff, reduce CSOs
- Help replenish groundwater in GCOD
- Develop maintenance protocol to ensure effectiveness of the system
- Replicate system in other locations in the City
- Assess the effectiveness of porous alleys in comparison to cities like Philadelphia, New York, Chicago, Baltimore

GREENOVATE BOSTON

BOSTONIA CONDITA A.D. 1630.

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When it rains, it recharges

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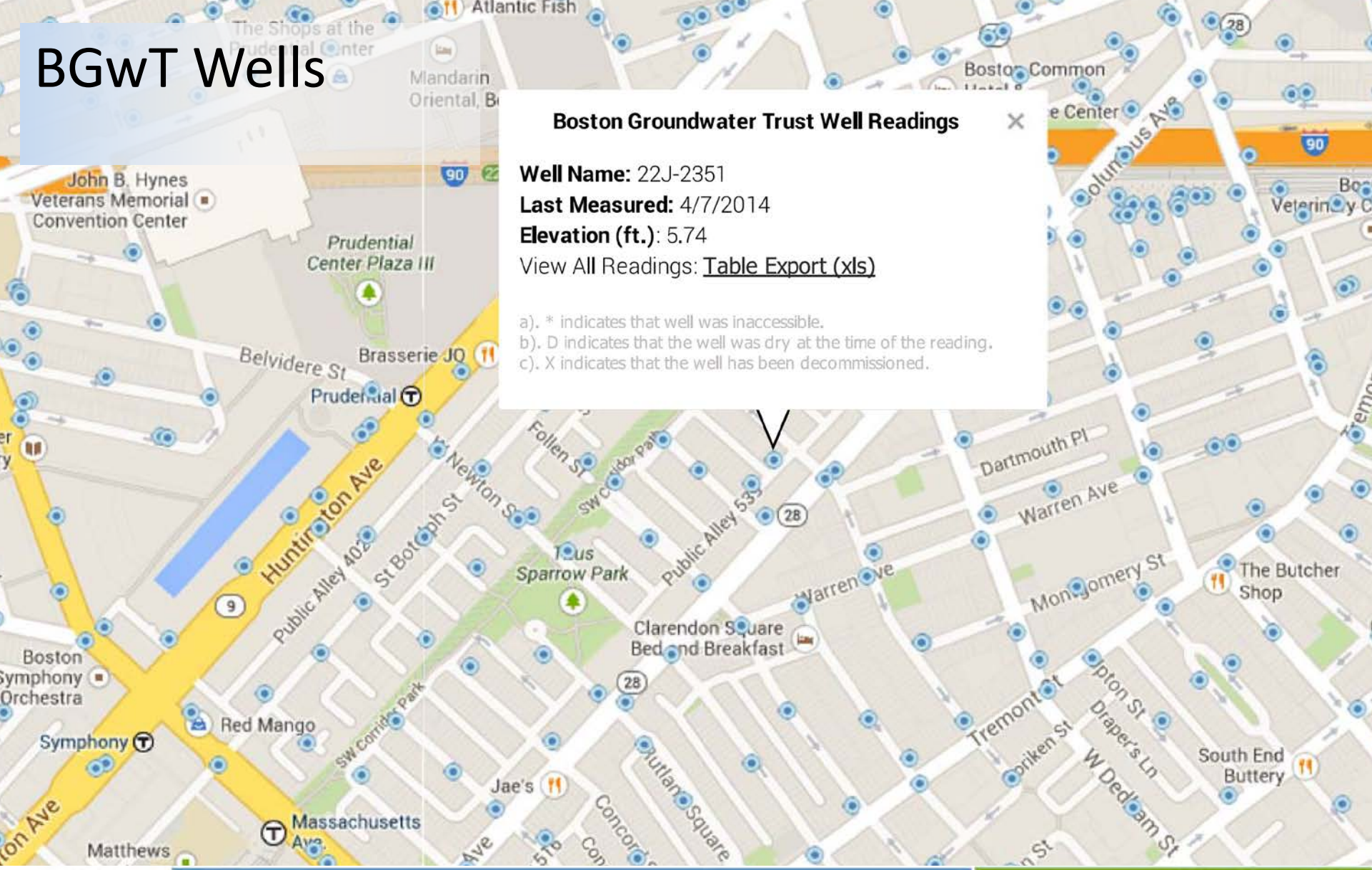
Public Alley # 543

Charles River Watershed Association
Boston Public Works Department
Boston Groundwater Trust

Project Site: Public Alley 543

BGwT Wells



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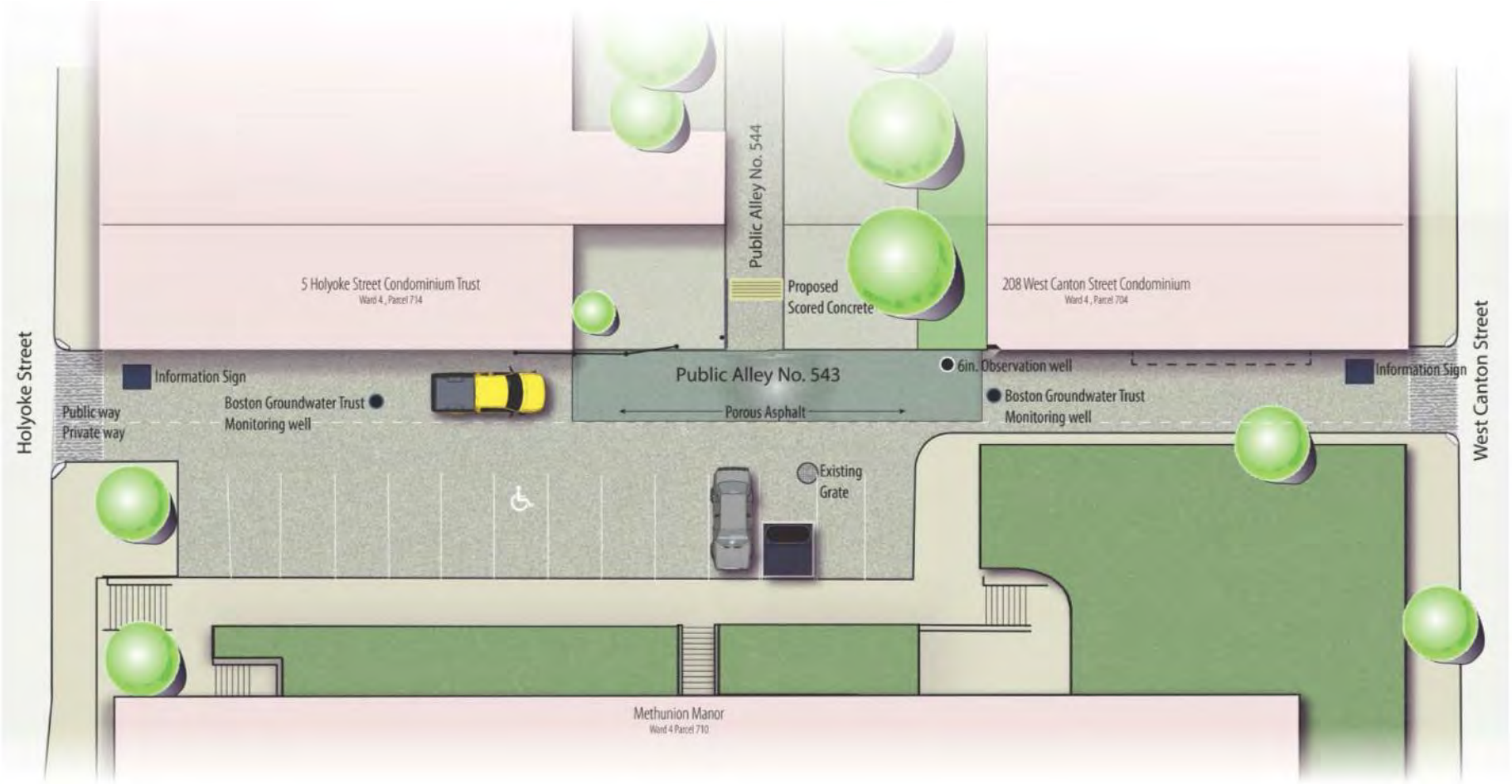
Public Alley # 543

Charles River Watershed Association
Boston Public Works Department
Boston Groundwater Trust

Alley Design



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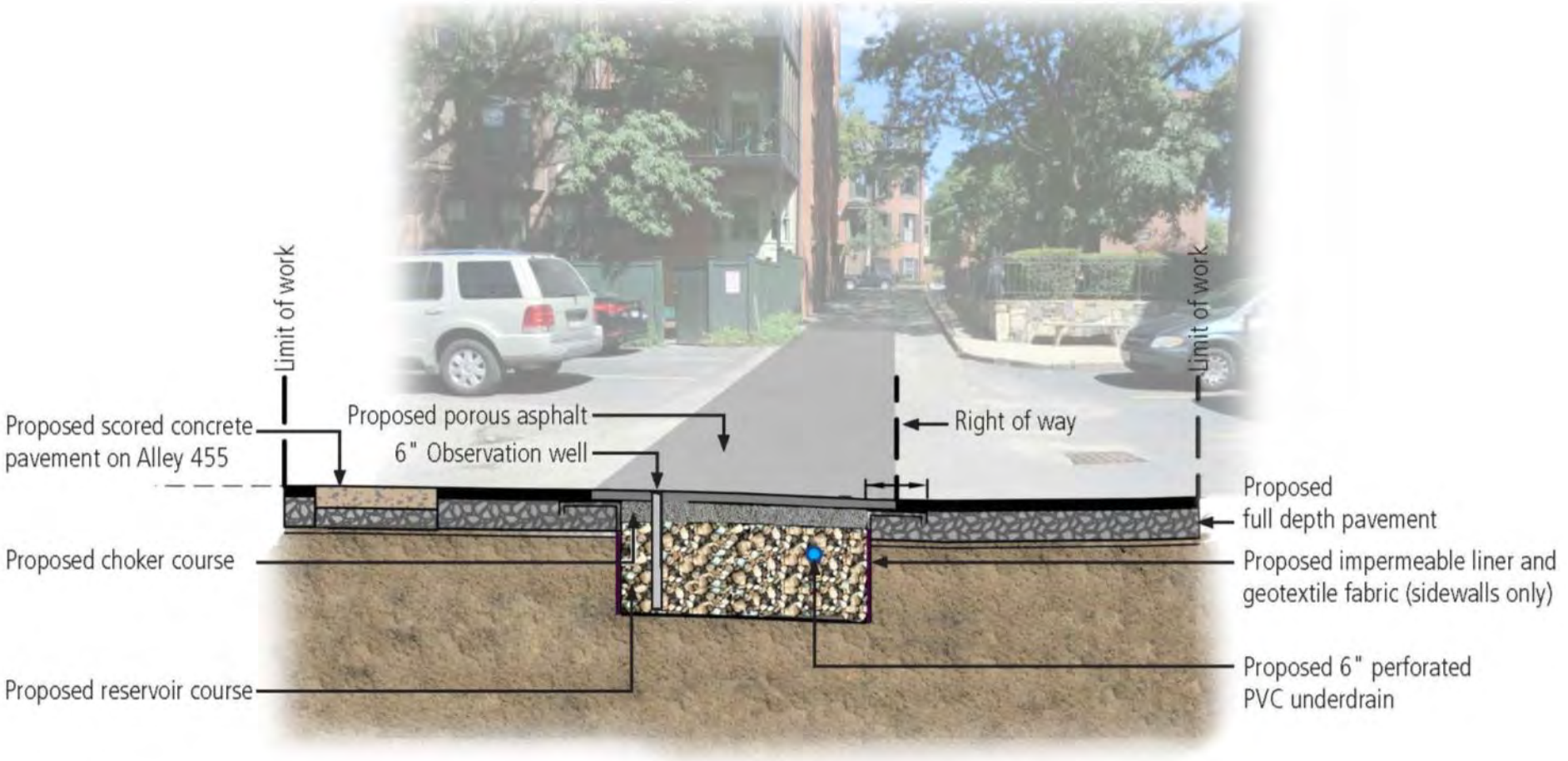
Alley Design



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Public Alley # 543

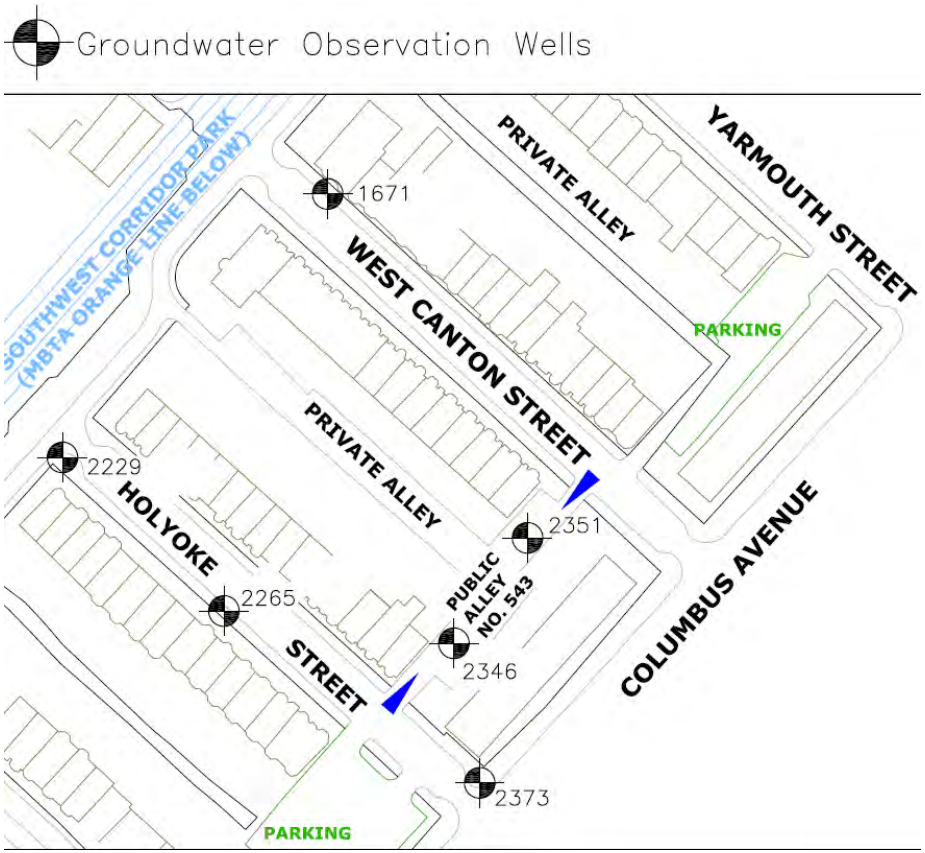
Charles River Watershed Association
Boston Public Works Department
Boston Groundwater Trust

Public Outreach- Residents Concerns

- Project limits
- Parking Disruption
- Dumpster Relocation

Groundwater & Water Quality Monitoring Program

- Boston Groundwater Trust monitoring groundwater levels at two new observation wells installed in July 2013
- Monthly data logging prior to, during and after construction
- Increase in groundwater levels
- CRWA monitoring post construction water quality and recharge



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BOSTON POROUS ALLEY

When it rains, it recharges

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Public Alley # 543

Charles River Watershed Association
Boston Public Works Department
Boston Groundwater Trust

Construction Process

BOSTONIA CONDITA A.D. 1630.

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Public Alley # 543

Charles River Watershed Association
Boston Public Works Department
Boston Groundwater Trust

Curing Process

BOSTONIA CONDITA A.D. 1630.

BOSTON POROUS ALLEY

When it rains, it recharges

Project funded by Massachusetts DEP and designed by Vanasse Hangen Brustlin

Public Alley # 543

Charles River Watershed Association
Boston Public Works Department
Boston Groundwater Trust

Ribbon Cutting

BOSTONIA CONDITA A.D. 1630.

BOSTON POROUS ALLEY

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Ongoing Monitoring

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Public Alley # 543

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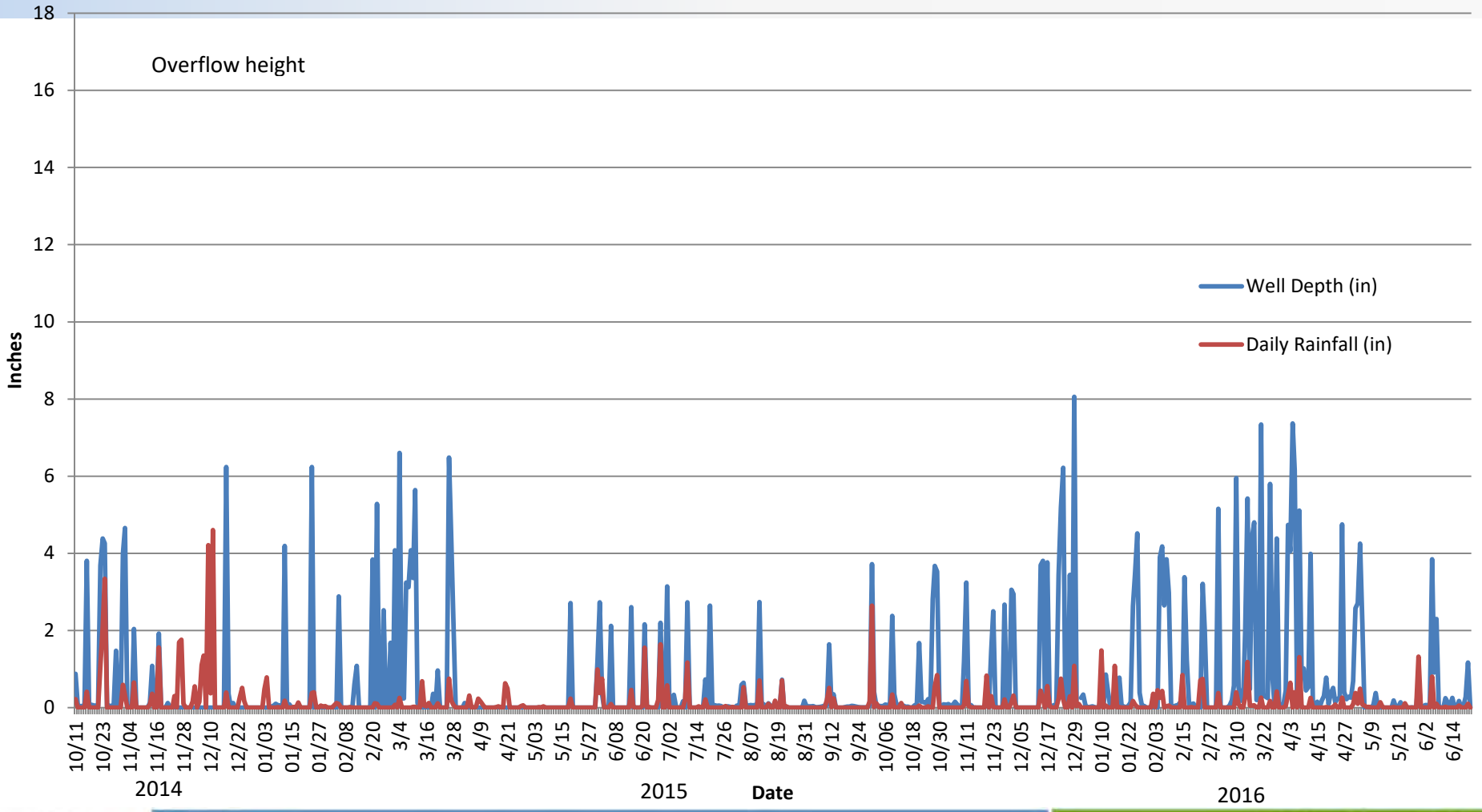
Boston Public Works Department
Boston Groundwater Trust

Monitoring Results



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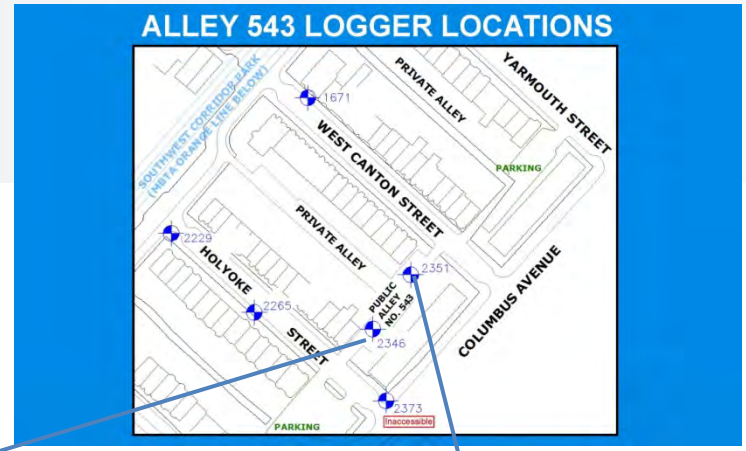
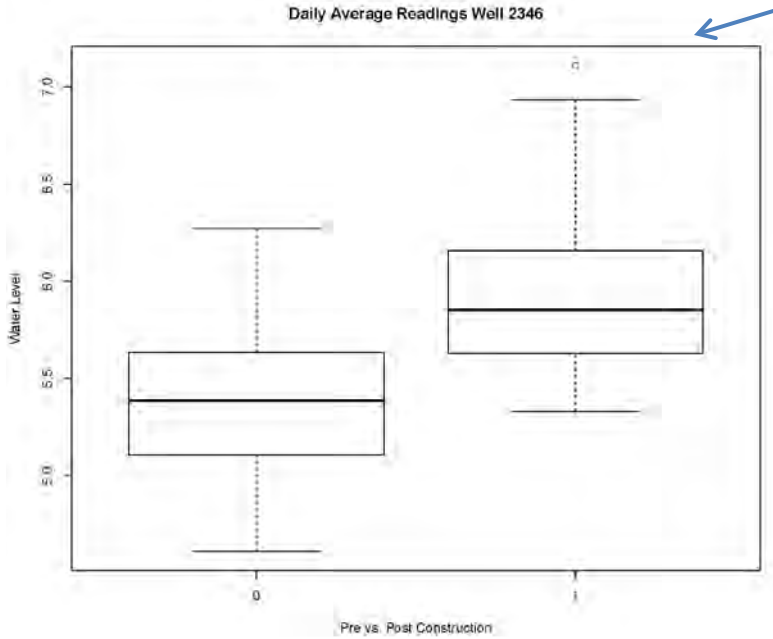
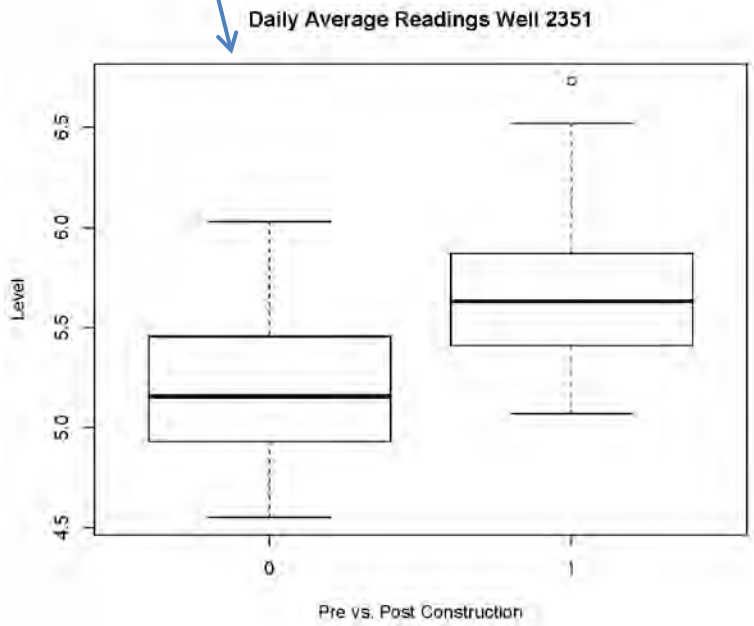
Monitoring Results







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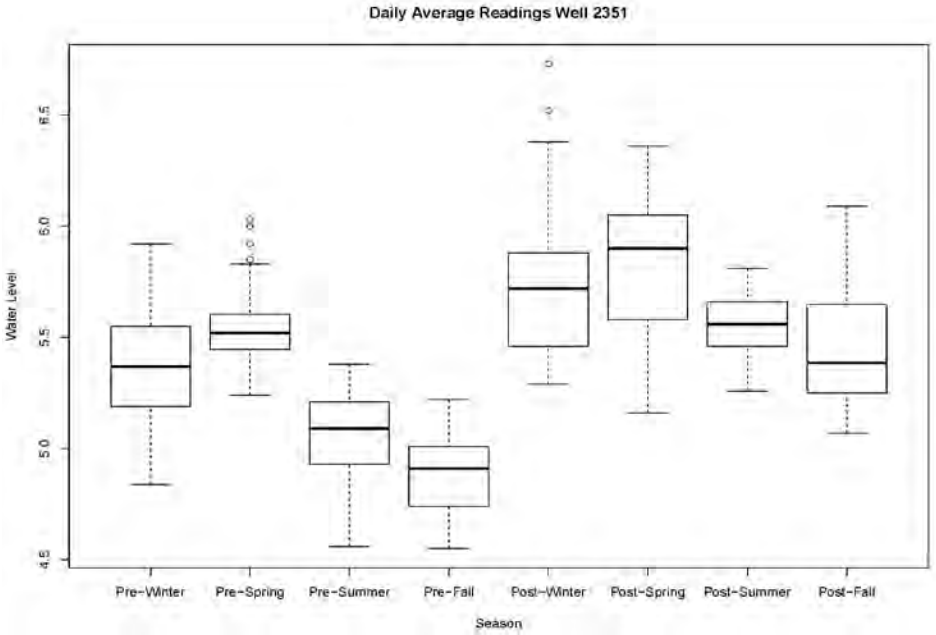

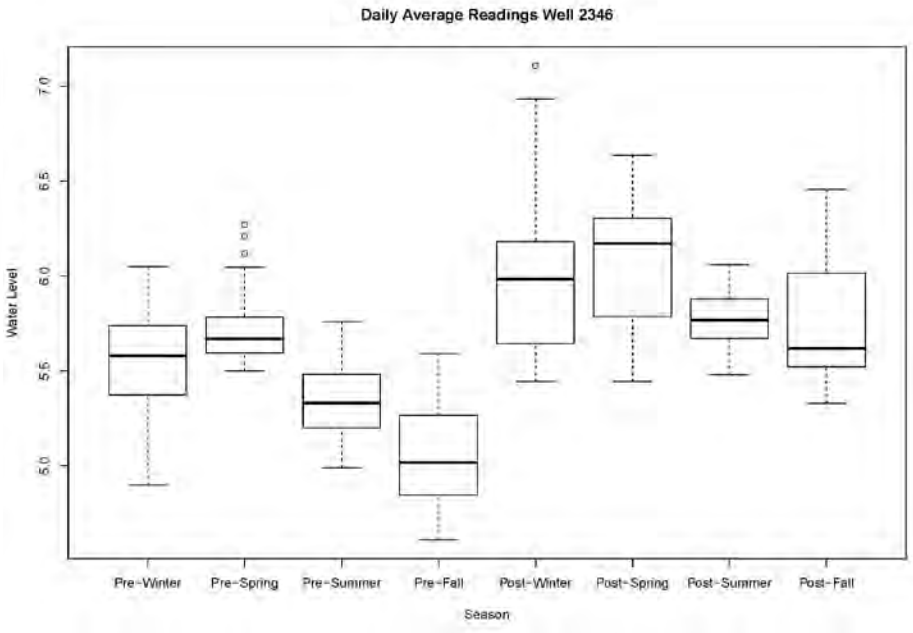

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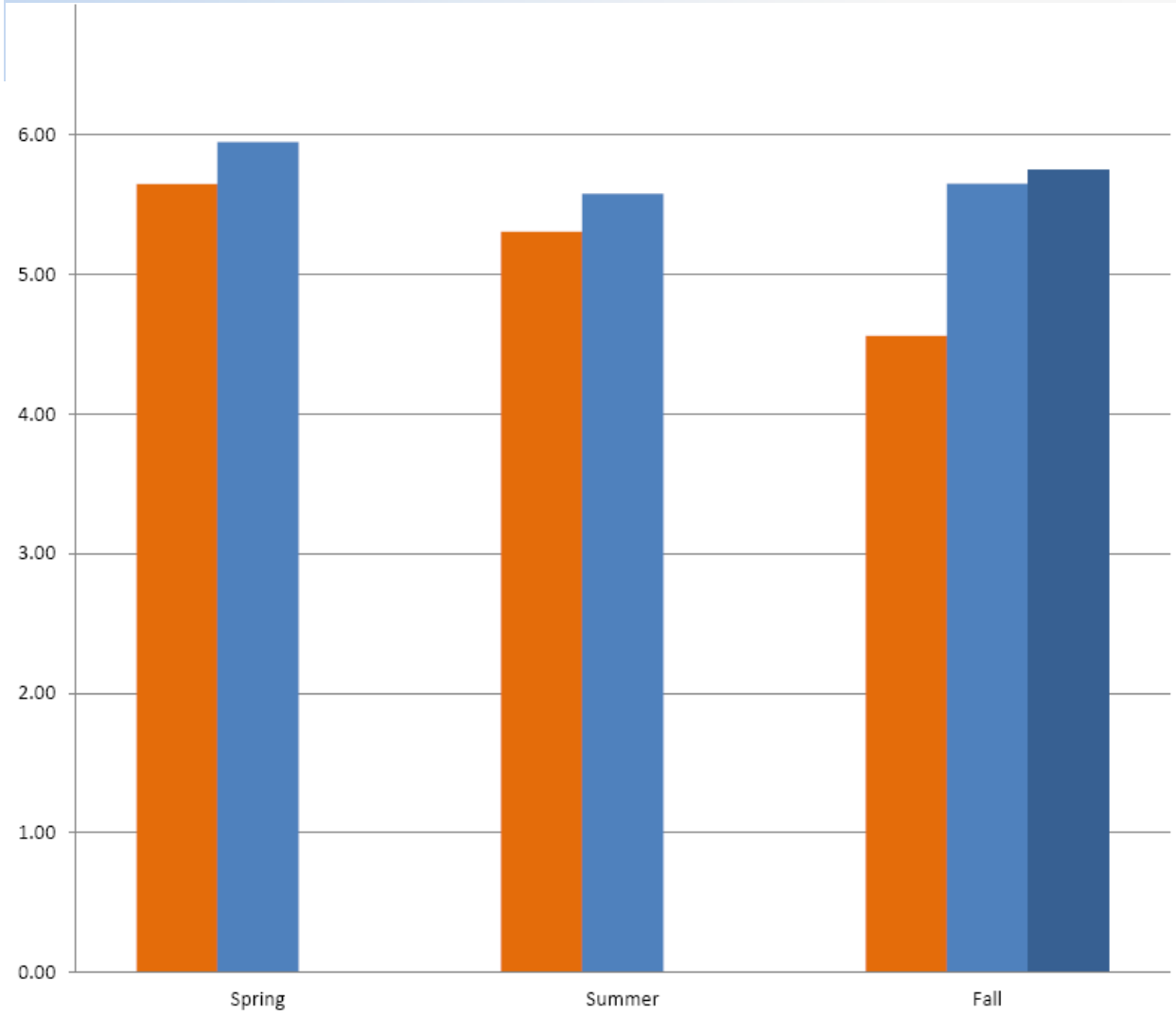

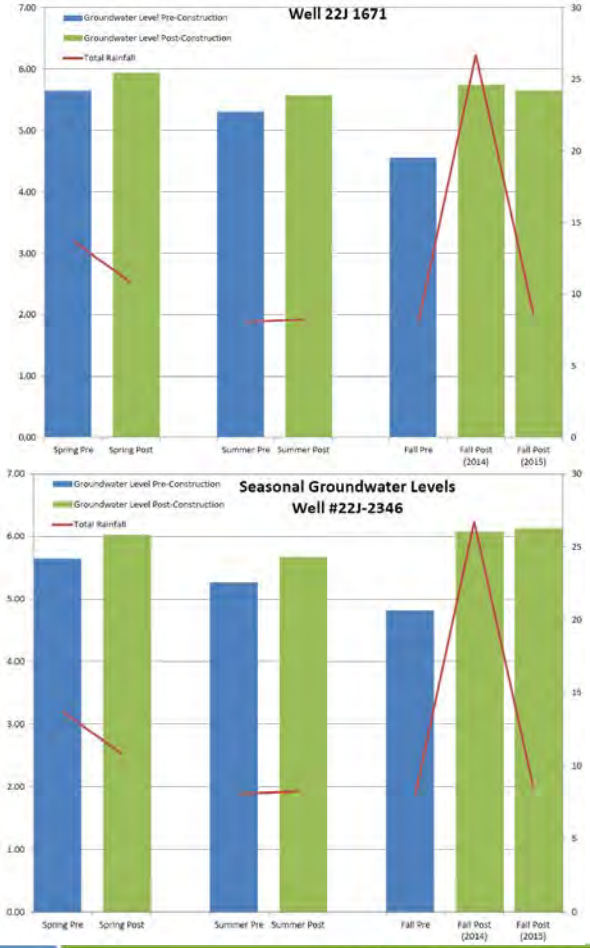

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Project Summary Report and Handouts

Boston's Porous Alley Demonstration Project

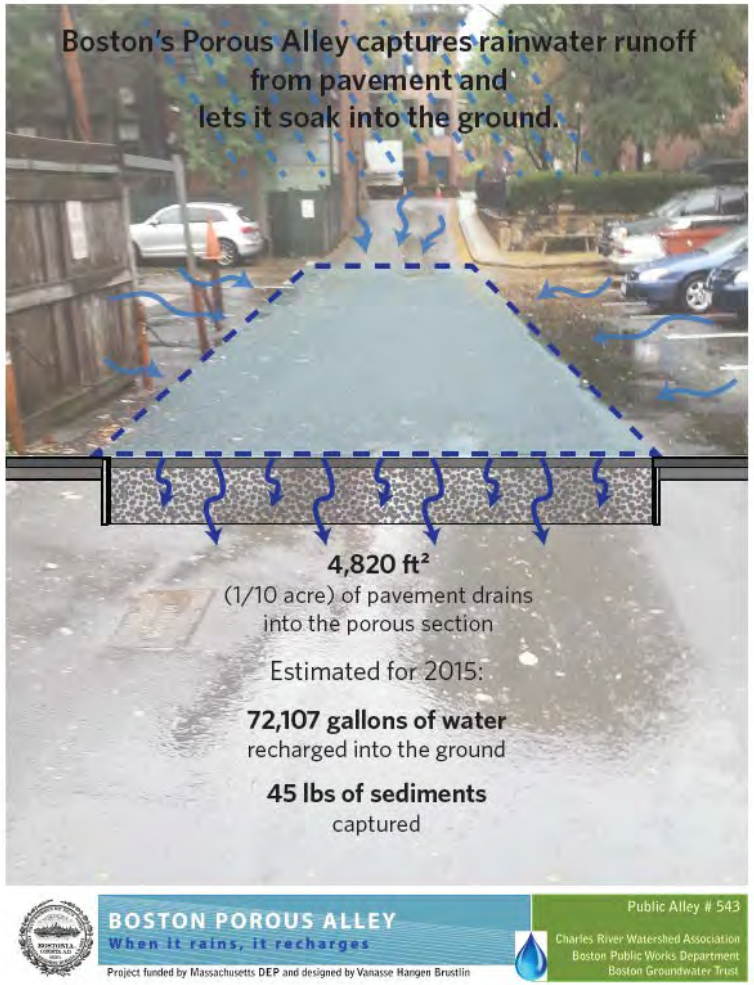
Summary Report

April 2016

Project Funded by:
Massachusetts Department of Environmental Protection -
Section 319 Grant Program

Project Partners:
City of Boston
Charles River Watershed Association
The Boston Groundwater Trust

Project Engineer:
Vanasse Hangen Brustlin, Inc



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More Information: charlesriver.org

Questions?

http://www.crwa.org/blue-cities/demonstration-projects/porous-alley