

# DUXBURY/KINGSTON BAY



PROJECT AREA

## STORMWATER MITIGATION 2002-2016

ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE MARCH 16, 2017

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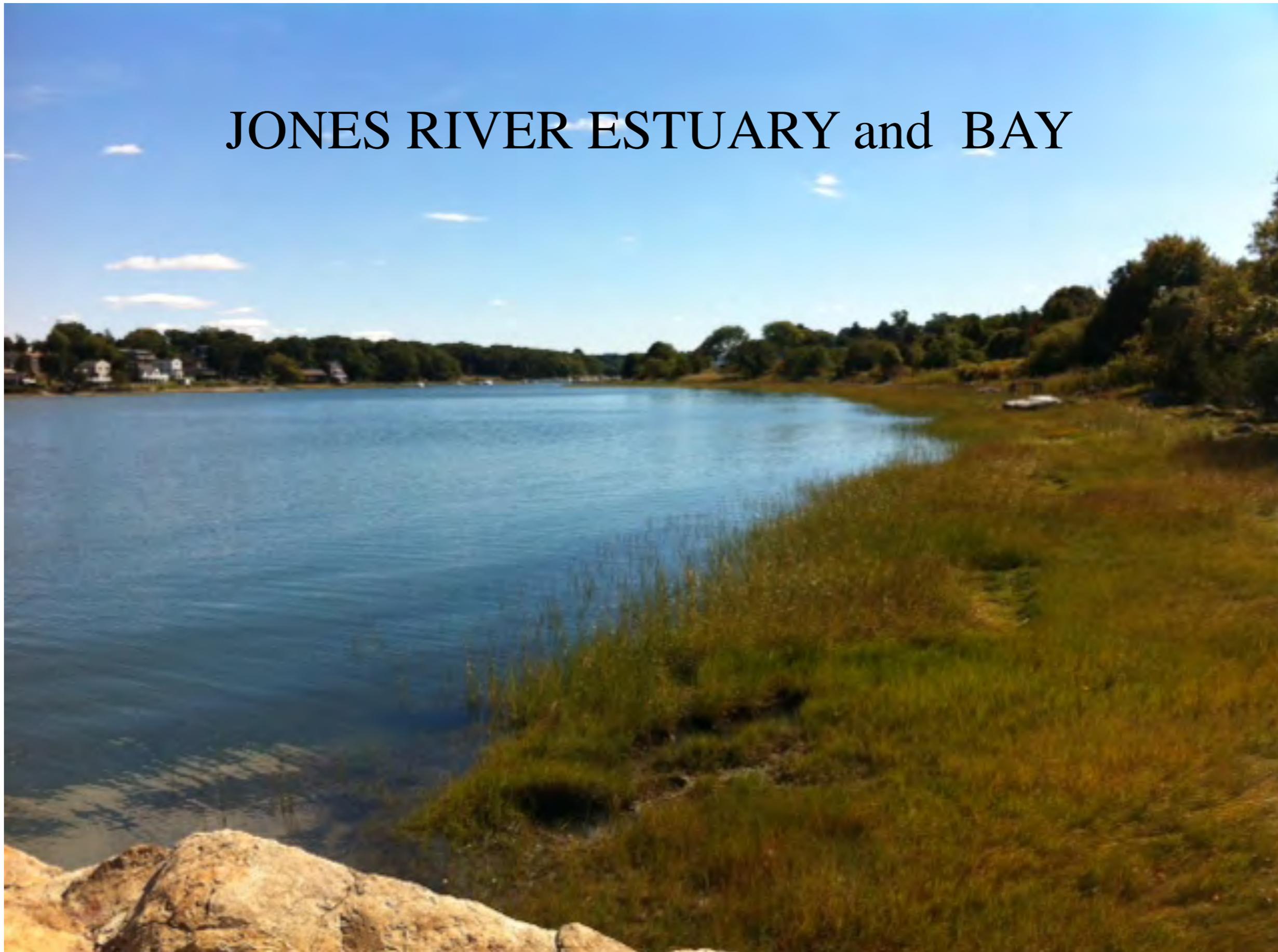
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

# OYSTER CAGES - DUXBURY BAY



# JONES RIVER ESTUARY and BAY



*ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017*

# DUXBURY/KINGSTON BAY THROUGH THE YEARS

PROJECT ACTIVITY: 17 GRANTS TALLING \$1.65M

Including: 12 Construction Projects Under CPR totalling \$1.5M

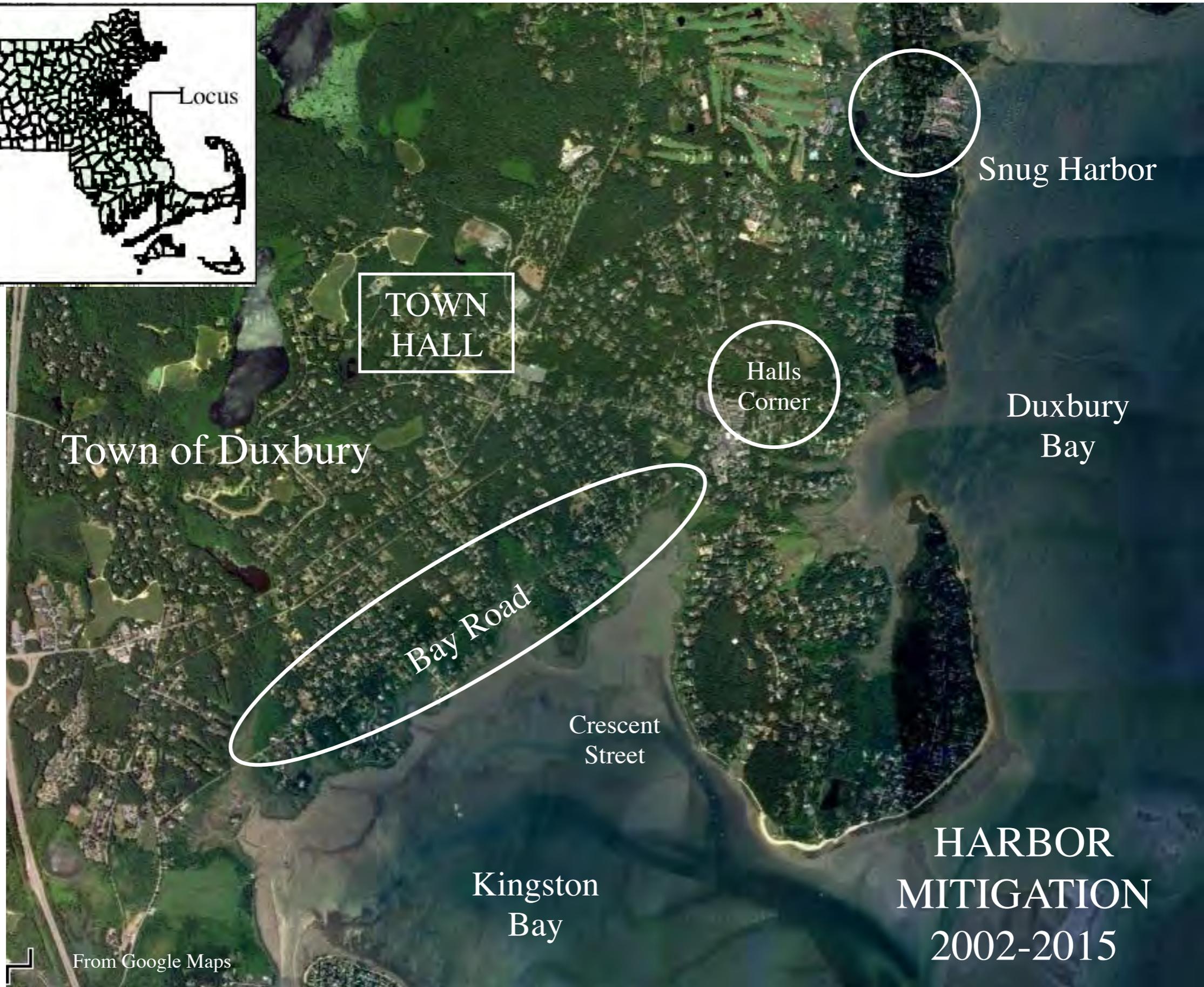
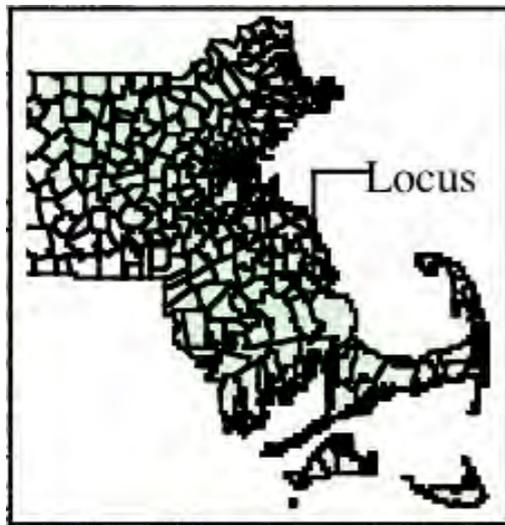
2 Studies under 604b totalling \$102,220

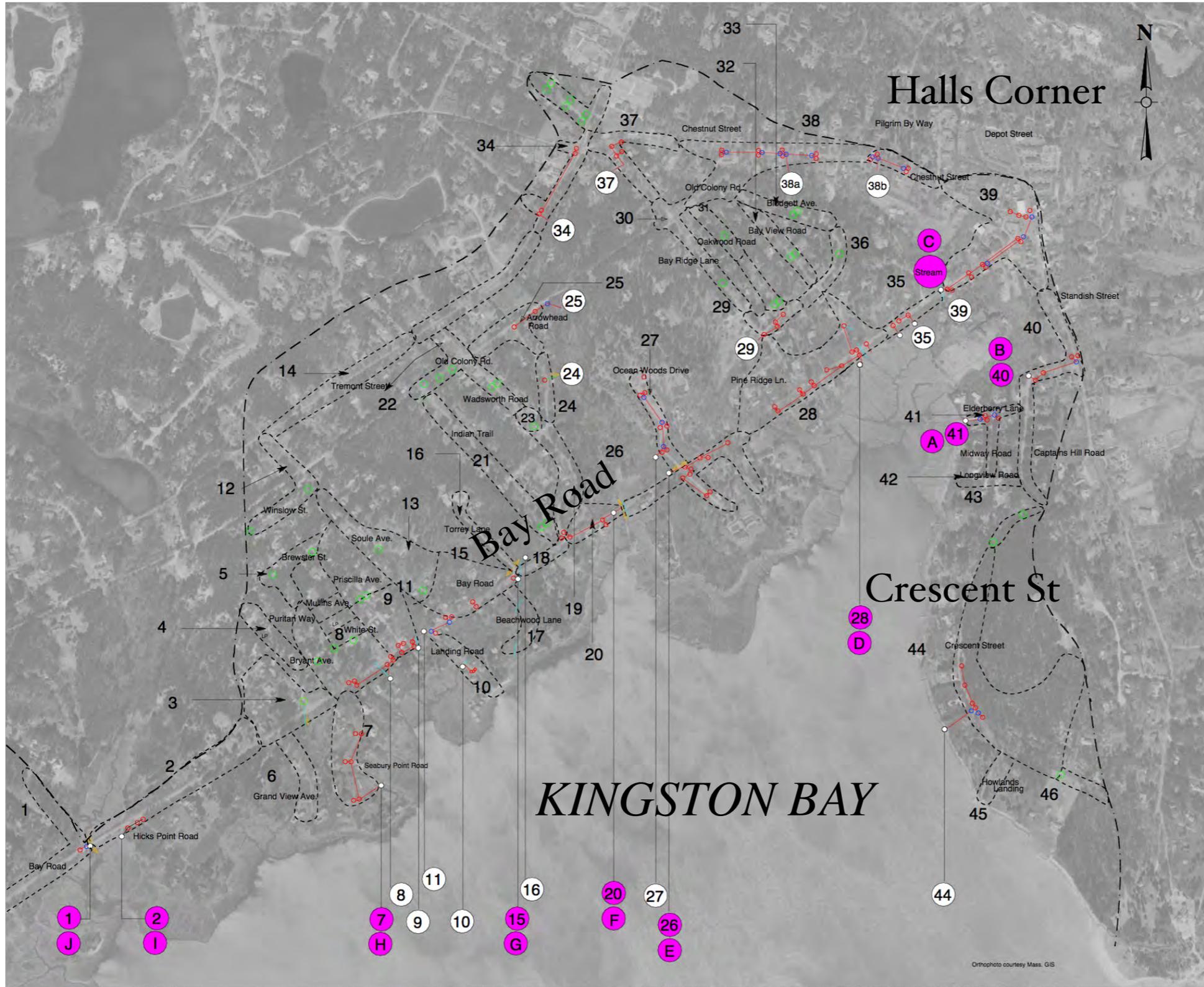
1 Study under MassBays totalling \$15,000

## 10 OUTFALLS MITIGATED

<u>YEAR</u>	<u>PROGRAM</u>	<u>GRANT</u>	<u>PROJECT ACTIVITY</u>
2002-2003	CZM Tech Asst	\$19,940	Assessment and Design at Snug Harbor
2005	CPR	\$150,542	BMPs @ 9 Locations, Snug Harbor
2006	Coastal NPS	\$21,420	Bay Road Assessment Report
2007	CPR	\$125,000	BMPs @ 7 Locations, Halls Corner, #39
2008	CPR	\$118,699	BMPs @ 3 Locations, Bay Road, #39
2009	CPR	\$114,962	BMPs @ 4 Locations, Crescent St S, #44
2010	CPR	\$124,222	BMPs @ 3 Locations, Crescent St N, #44
2010-2011	604b	\$53,600	Study/Design, 4 outfalls, Bay Road
2011 K	MassBays	\$15,000	Study/Design, 12 outfalls, Jones River
2012-2014 K	604b	\$48,620	Study/Design, 10 outfalls, Jones River
2012	CPR	\$124,386	BMPs @ 3 locations, Bay Road, #28
2013	CPR	\$124,115	BMPs @ 3 locations, Bay Road, #28
2013 K	CPR	\$124,495	BMPs for 2 Outfalls, Jones River
2014 K	CPR	\$116,627	BMPs for 2 Outfalls, Jones River
2015	CPR	\$125,000	BMPs @ 3 Locations, 3 Outfalls
2015 K	CPR	\$118,300	3 BMPs for 1 Outfall, Jones River
2016 K	CPR	\$125,000	3 BMPs for 1 Outfall, Jones River

**TOTAL: \$1,649,928 AWARDED**



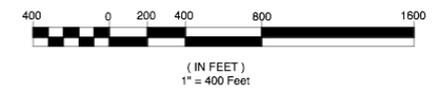


PROJECT LOCUS  
SCALE: 1" = 2000'

**LEGEND**

- 20 Subdrainage Area ID Number
- Leach Pit
- Drain Manhole
- Catch Basin
- Drain Pipe
- Road Cut
- Cross Culvert
- - - Drainage Area Limit
- - - Subdrainage Area Limit
- 10 Area Outfall
- A Sampling Stations

**GRAPHIC SCALE**



**PLATE 1  
BAY ROAD/THE NOOK  
DRAINAGE BASIN**

AMERICAN RECOVERY AND REINVESTMENT ACT  
Kingston Bay Stormwater Mitigation Project  
2009-06/ARRA 604  
EPA RFA No. 10072

SCALE: 1" = 400'

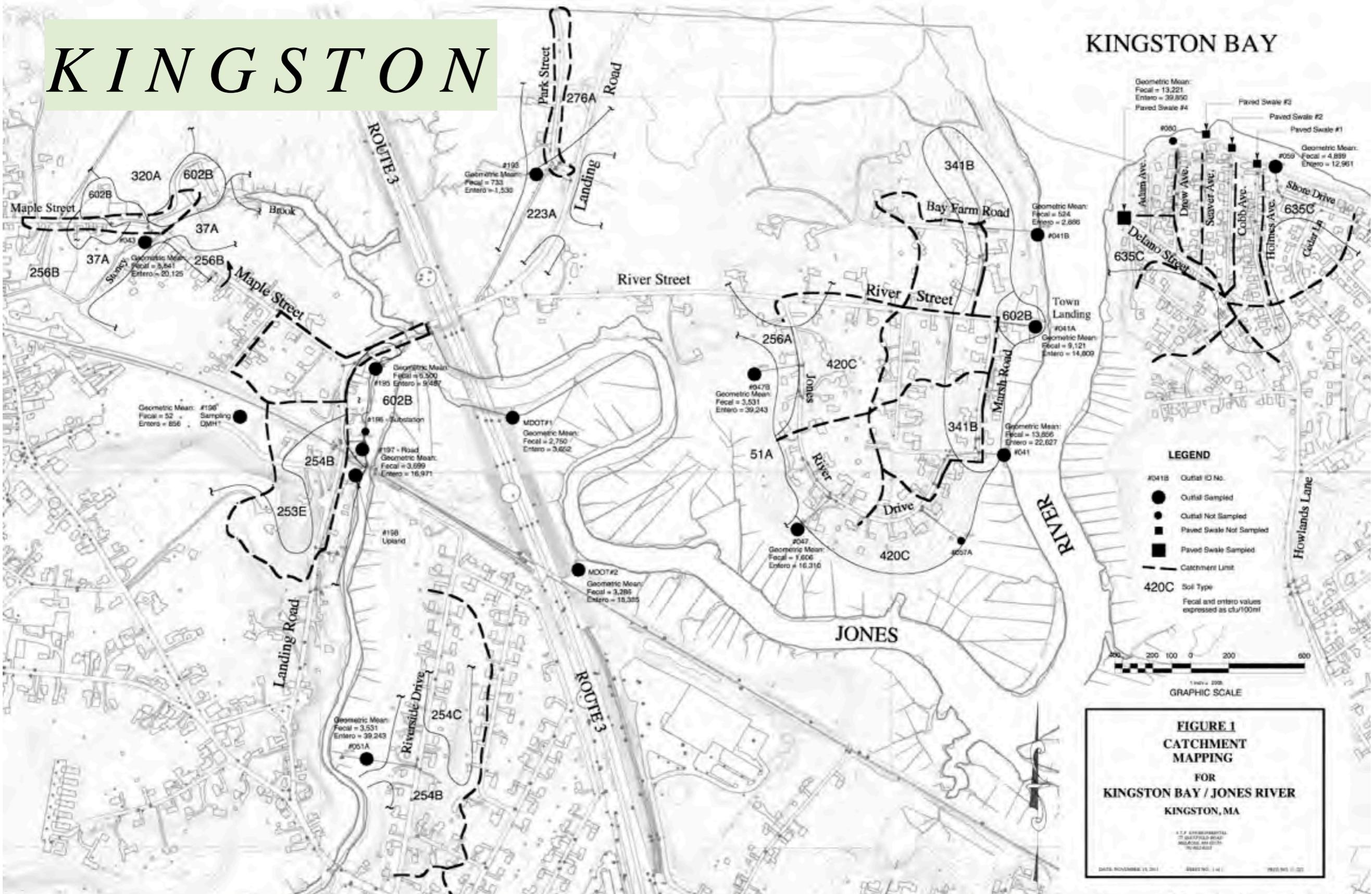
ATP ENVIRONMENTAL  
77 Sheffield Road  
Melrose, MA 02176

Date: August 2010

Proj. No. 10-214

# KINGSTON

# KINGSTON BAY



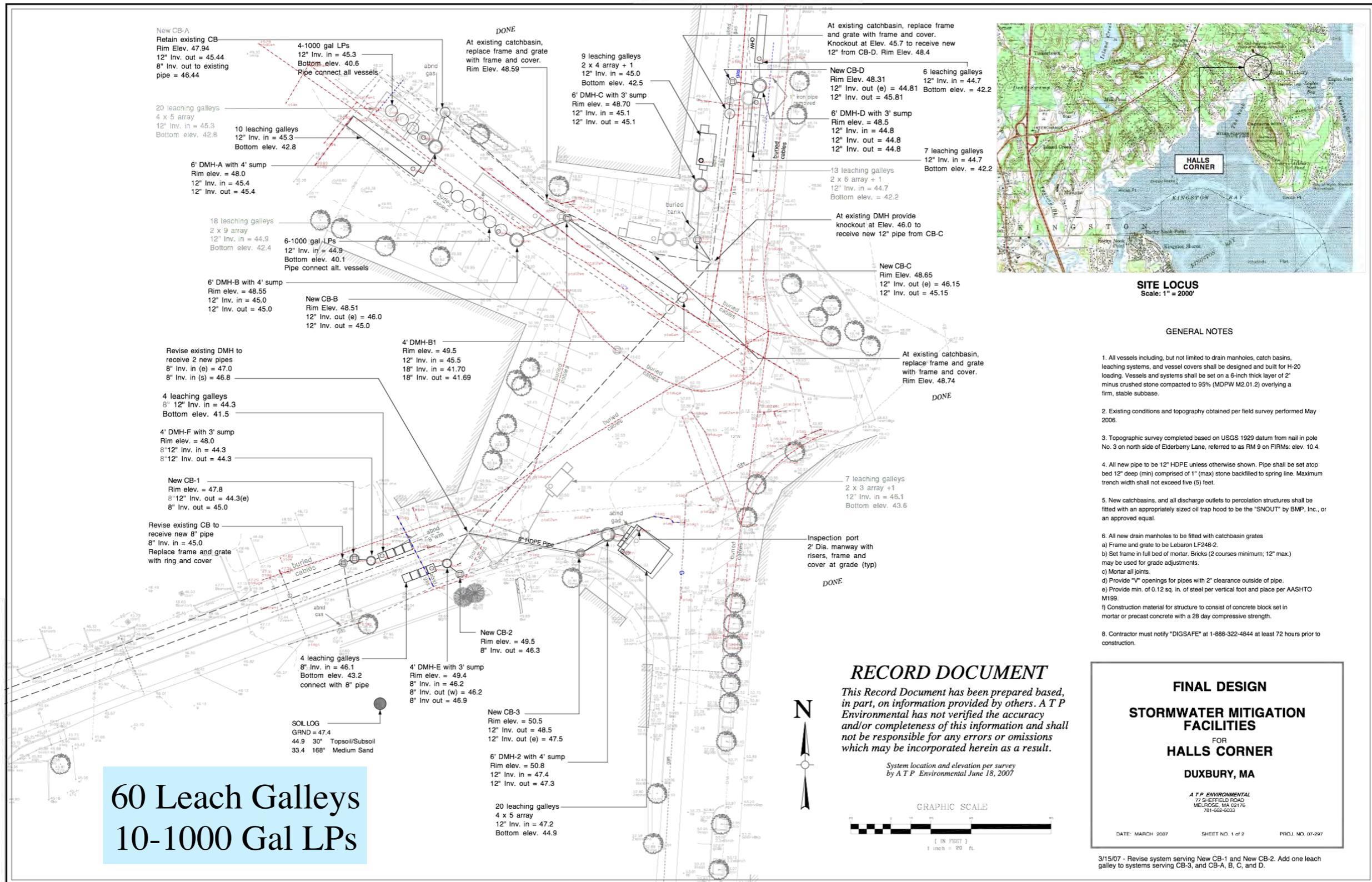
# JONES RIVER CATCHMENT MAPPING

MassBays Project

# Matrix Analysis

Table 6  
Decision Matrix

POLLUTANT LEVEL		BAY PROXIMITY	CONSTRUCT.	TOTAL	RANK	OUTFALL #
Fecal Units	Entero. Units					
3	3	5	3	14		#59
4	5	5	3	17	2	P. Swale #4
4	3	5	4	16	4	#041A
1	1	5	4	11		#041B
5	4	4	4	17	2	#041
1	2	3	5	11		#047
5	5	3	5	18	1	#047B
5	3	2	3	13		#195
2	4	2	2	10		#197
1*	1*					#198
3	3	2	3	11		#043
1	1	2	4	8		#193
3	5	1	5	14		#051A



**60 Leach Galleys  
10-1000 Gal LPs**



**SITE LOCUS**  
Scale: 1" = 2000'

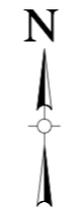
**GENERAL NOTES**

1. All vessels including, but not limited to drain manholes, catch basins, leaching systems, and vessel covers shall be designed and built for H-20 loading. Vessels and systems shall be set on a 6-inch thick layer of 2" minus crushed stone compacted to 95% (MDPW M2.01.2) overlying a firm, stable subbase.
2. Existing conditions and topography obtained per field survey performed May 2006.
3. Topographic survey completed based on USGS 1929 datum from nail in pole No. 3 on north side of Elderberry Lane, referred to as RM 9 on FIRMs: elev. 10.4.
4. All new pipe to be 12" HDPE unless otherwise shown. Pipe shall be set atop bed 12" deep (min) comprised of 1" (max) stone backfilled to spring line. Maximum trench width shall not exceed five (5) feet.
5. New catchbasins, and all discharge outlets to percolation structures shall be fitted with an appropriately sized oil trap hood to be the "SNOUT" by BMP, Inc. or an approved equal.
6. All new drain manholes to be fitted with catchbasin grates
  - a) Frame and grate to be Lebaron LF248-2.
  - b) Set frame in full bed of mortar. Bricks (2 courses minimum; 12" max.) may be used for grade adjustments.
  - c) Mortar all joints.
  - d) Provide "V" openings for pipes with 2" clearance outside of pipe.
  - e) Provide min. of 0.12 sq. in. of steel per vertical foot and place per AASHTO M199.
  - f) Construction material for structure to consist of concrete block set in mortar or precast concrete with a 28 day compressive strength.
8. Contractor must notify "DIGSAFE" at 1-888-322-4844 at least 72 hours prior to construction.

**RECORD DOCUMENT**

*This Record Document has been prepared based, in part, on information provided by others. A T P Environmental has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result.*

System location and elevation per survey by A T P Environmental June 18, 2007



**FINAL DESIGN**  
**STORMWATER MITIGATION FACILITIES**  
FOR  
**HALLS CORNER**  
**DUXBURY, MA**

A T P ENVIRONMENTAL  
77 SHEFFIELD ROAD  
MELROSE, MA 02176  
781-662-6033

DATE: MARCH 2007      SHEET NO. 1 of 2      PROJ. NO. 07-297

3/15/07 - Revise system serving New CB-1 and New CB-2. Add one leach galley to systems serving CB-3, and CB-A, B, C, and D.

**OUTFALL 39 MITIGATION, 2007**  
**\$125,000 GRANT**

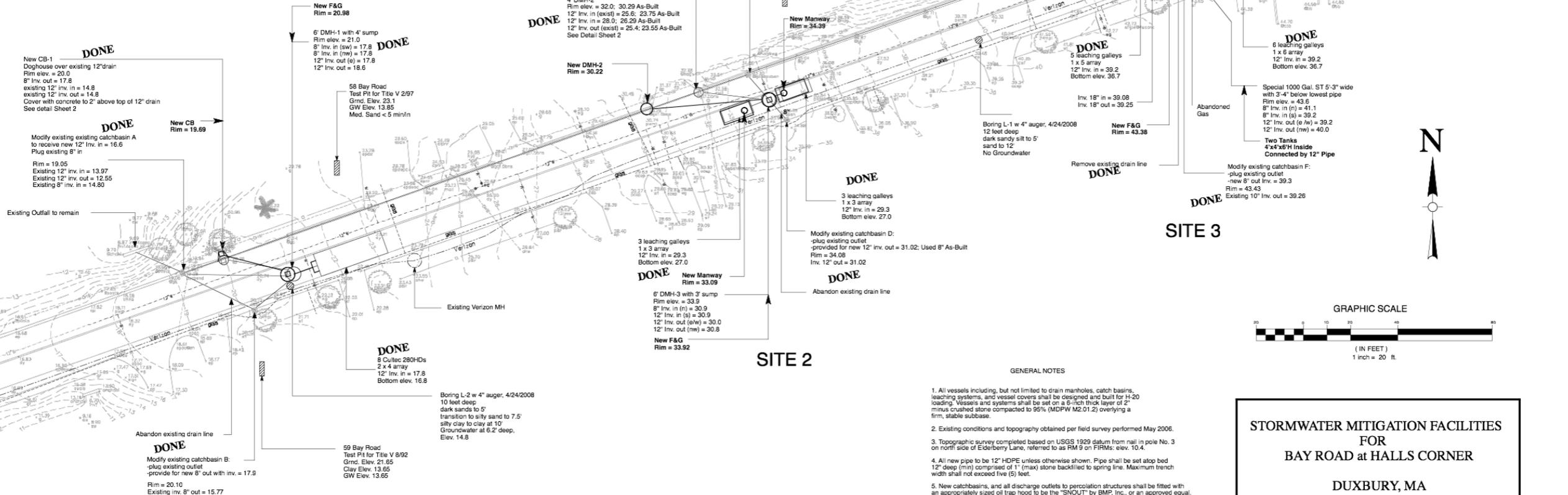
*ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017*

PROJECT LOCUS



8 Cultec 280 HDs  
17 Leach Galleys

SCALE: 1" = 2000'



RECORD DOCUMENT

*This Record Document has been prepared based, in part, on information provided by others. A T P Environmental has not verified the accuracy and/or completeness of this information and shall not be responsible for any error.*

System location and elevation per survey by Vine Associates, Inc. on September 9, 2008 for A T P Environmental.

- GENERAL NOTES
1. All vessels including, but not limited to drain manholes, catch basins, leaching systems, and vessel covers shall be designed and built for H-20 loading. Vessels and systems shall be set on a 6-inch thick layer of 2" minus crushed stone compacted to 95% (MDPW M2.01.2) overlying a firm, stable subbase.
  2. Existing conditions and topography obtained per field survey performed May 2006.
  3. Topographic survey completed based on USGS 1929 datum from nail in pole No. 3 on north side of Eideberry Lane, referred to as RM 9 on FIRMs: elev. 10.4.
  4. All new pipe to be 12" HDPE unless otherwise shown. Pipe shall be set atop bed 12" deep (min) comprised of 1" (max) stone backfilled to spring line. Maximum trench width shall not exceed five (5) feet.
  5. New catchbasins, and all discharge outlets to percolation structures shall be fitted with an appropriately sized oil trap hood to be the "SNOUT" by BMP, Inc., or an approved equal.
  6. All new drain manholes to be fitted with catchbasin grates
    - a) Frames and grates to be Libbaron LF245-2
    - b) Set frame in full bed of mortar. Bricks (2 courses minimum; 12" max.) may be used for grade adjustments.
    - c) Mortar all joints.
    - d) Provide "V" openings for pipes with 2" clearance outside of pipe.
    - e) Provide min. of 0.12 sq. in. of steel per vertical foot and piece per AASHTO M199.
    - f) Construction material for structure to consist of concrete block set in mortar or precast concrete with a 28 day compressive strength.
  7. Contractor must notify "DIGSAFE" at 1-888-322-4844 at least 72 hours prior to construction.

**STORMWATER MITIGATION FACILITIES  
FOR  
BAY ROAD at HALLS CORNER  
DUXBURY, MA**

A T P ENVIRONMENTAL  
77 SHEFFIELD ROAD  
MELROSE, MA 02176  
781-662-6033

DATE: May 19, 2008      SHEET NO. 1 of 2      PROJ. NO. 08-203

OUTFALL 39 MITIGATION, 2008  
\$118,699 GRANT

**PROJECT LOCUS**



SCALE: 1" = 2000'

**GENERAL NOTES**

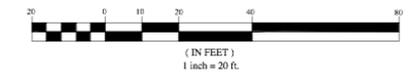
- All vessels including, but not limited to catchbasins, drain manholes, leaching structures, septic tanks, sleeves, and vessel covers, shall be designed and built for H-20 loading. Unless otherwise indicated, vessels shall be set on a 6" thick layer of 3/4" crushed stone compacted to 95% (MDP M2.01.4) overlying a firm, stable subbase.
- Existing conditions and topography obtained per field survey performed May 2006 by ATP ENVIRONMENTAL.
- Topographic survey completed based on USGS 1929 datum from nail in pole No. 3 on north side of Elderberry Lane, referred to as RM 9 on FIRMs; elev. 10.4.
- All new pipe is to be 12" HDPE unless otherwise shown. Pipe shall be set atop bed 6" deep (min) comprised of 1" (max) stone backfilled to 6" above top of pipe. Maximum trench width shall not exceed five (5) feet.
- An appropriately sized oil trap hood (Eliminator) shall be installed where noted on the plans.
- All new drain manholes to be fitted with catchbasin grates
  - Frame and grate to be Le Baron LA 248-2
  - Drain manhole hood to be BMP "Snout" or equivalent.
  - Set frame in full bed of mortar. Bricks (3-5 courses) may be used for grate adjustments.
  - Mortar all joints.
  - Provide 1/2" openings for pipes with 2" clearance outside on pipe.
  - Provide min. of 0.12 sq. in. of steel per vertical foot and place per AASHTO M199.
  - Construction material for structure to consist of concrete block set in mortar or precast concrete with a 28 day compressive strength of 4000 psi.
- Contractor must notify "DIGSAFE" at 1-888-944-7233 at least 72 hours prior to construction.
- New septic tanks and drain manholes shall have risers with frame and grate to grade where shown on plans.
- Contractor shall comply with all applicable Federal, State, and local trenching requirements.

**RECORD DOCUMENT**

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Note: Between the time of site survey/design and the time of construction, Crescent Street was resurfaced. All construction, therefore, is based on the original surface elevations.

**GRAPHIC SCALE**



**STORMWATER MITIGATION FACILITIES**

**FOR CRESCENT STREET NORTH DUXBURY, MA**

ATP ENVIRONMENTAL  
77 SHEFFIELD ROAD  
MELROSE, MA 02175  
781-662-6033

DATE: April 5, 2010

SHEET NO: 1 of 1

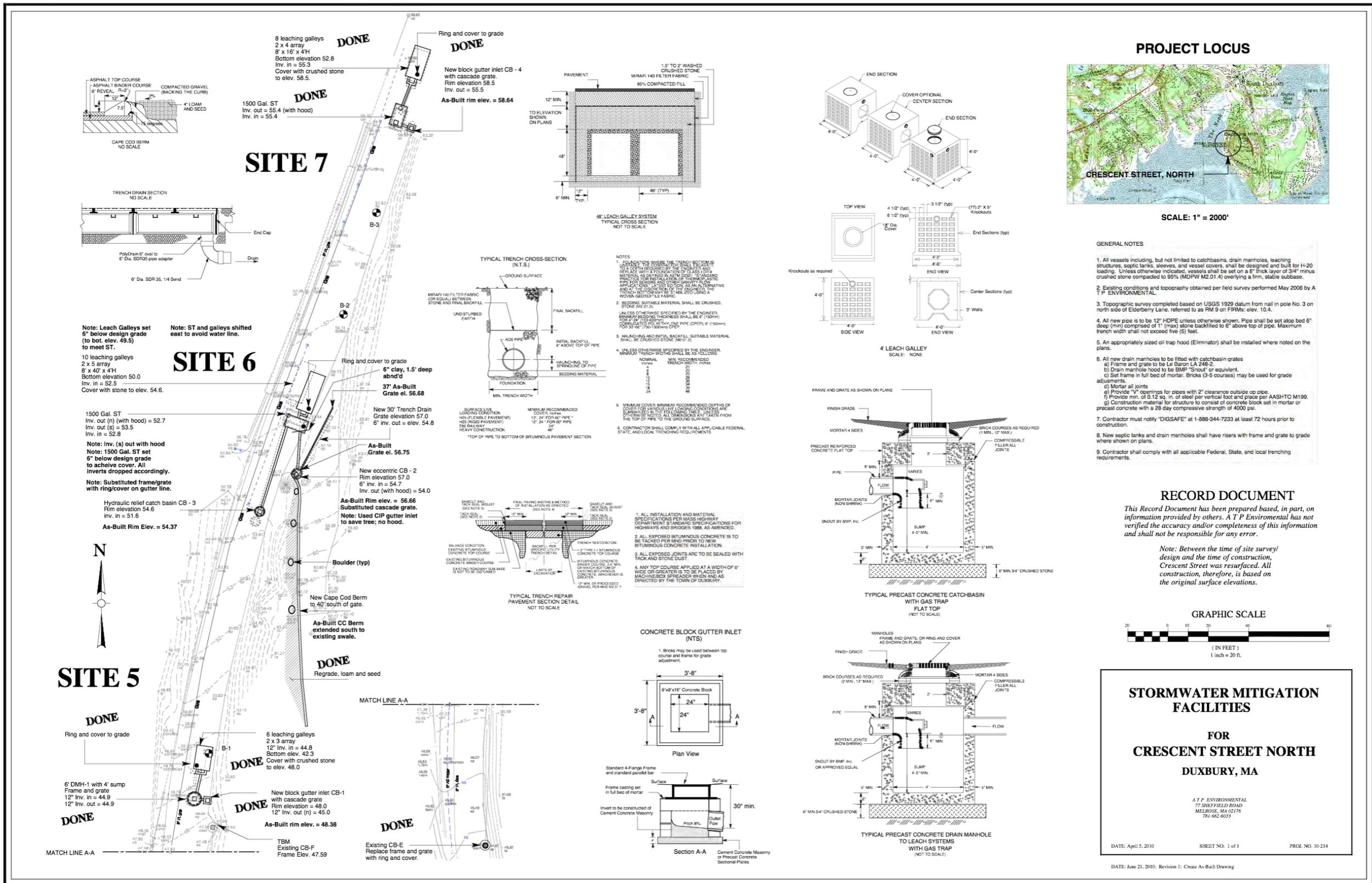
PROJ. NO. 10-214

DATE: June 21, 2010; Revision 1: Create As-Built Drawing

**24 Leach Galleys**

**OUTFALL 44 MITIGATION, 2010**  
**\$124,222 GRANT**

ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017





New CB over  
Existing Drain

Bay Road CPR'08

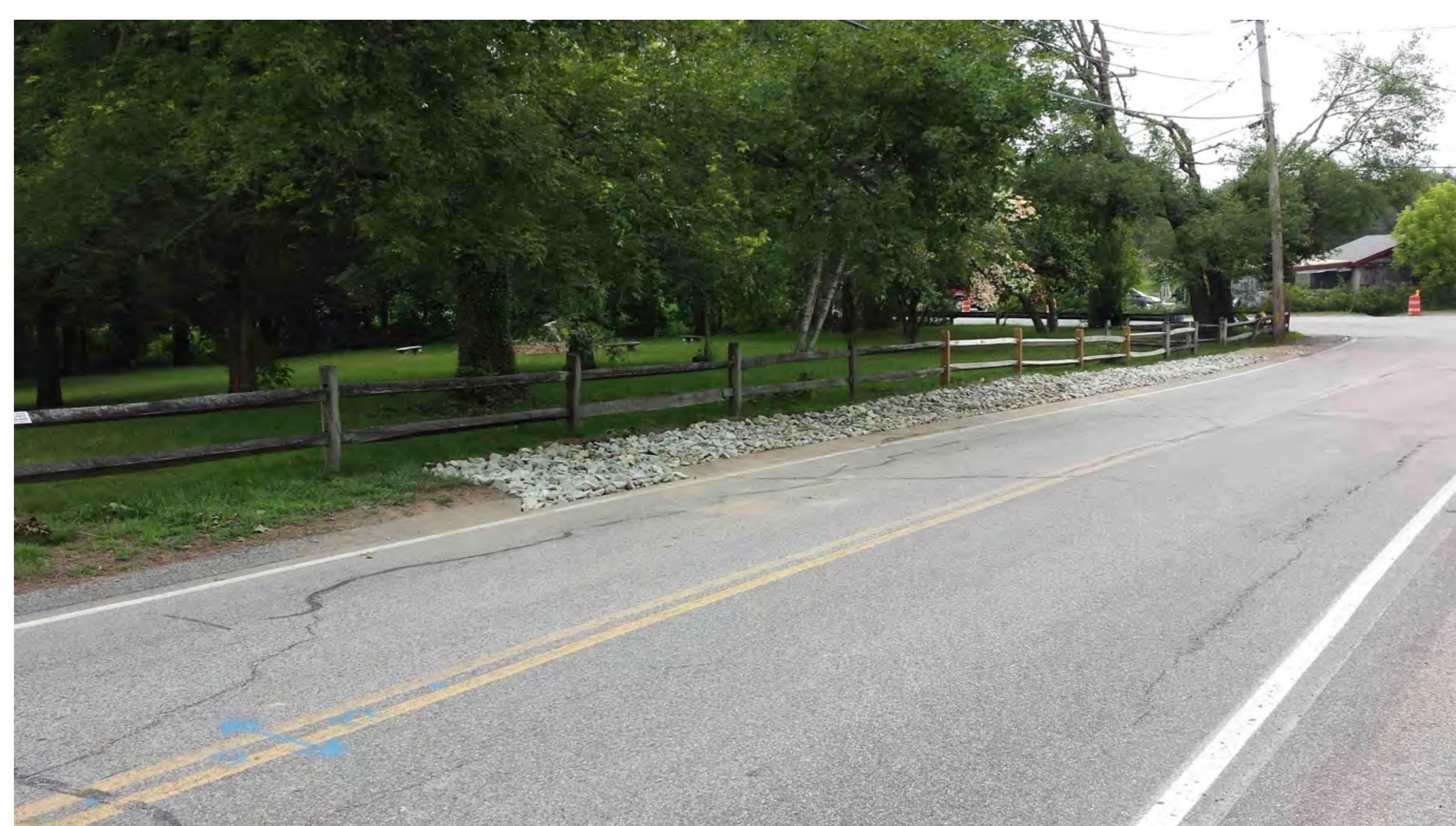


New DMH on  
Existing Drain

Bay Road CPR'08



## DEFLECTION WALLS



# BERM CUT to ROCKY SWALE

*ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017*

JONES RIVER  
WATERSHED  
ASSOCIATION  
OUTFALL  
MITIGATION, 2015

\$118,300 GRANT

SEPTIC TANK  
w/ DEFLECTION WALL.  
INLET SIDE







## JRWA SEPTIC TANK DISCHARGE SIDE

*ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017*



# PRECAST LEACH CHAMBERS

*ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017*





# CATCHBASIN APRON BMP

*ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017*



# ELDERBERRY ROAD RAIN GARDEN

*ATP ENVIRONMENTAL, MELROSE, MA for WATERSHED ACTION ALLIANCE, MARCH 16, 2017*

# DELANO AVE PAVED SWALE MITIGATION



# RAIN GARDEN #1



2013. 7. 23 8:04

# OVERFLOW

2013. 7.23 8:47

# RAIN GARDEN #2



2013. 7. 23 8:46

# Weather History Graph July 23, 2013



# UNIT PRICE DATA\*

## UNIT COST PER FIRST FLUSH VOLUME (CF):

\$34.61 w/ \$11.72 Standard Deviation

## UNIT COST PER IMPERMEABLE SURFACE AREA (SF):

\$2.87 w/ \$0.97 Standard Deviation

## RATIO: DESIGN VOLUME TO FF VOLUME

33.73% w/ 7.04% Standard Deviation

## RATIO: BMP FOOTPRINT TO IMPERMEABLE SURFACE AREA

1.73% w/ 0.74% Standard Deviation

\*Based upon construction bid prices for nine (9) CPR-funded projects in Duxbury and Kingston completed between 2009 and 2016

# DUXBURY/KINGSTON BAY STORMWATER MITIGATION

2002-2016

