



**BOUCHARD B120 RELEASE
SHORELINE SEGMENT SUMMARY**

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GeoInsight Project Number 3871-002

SEGMENT IDENTIFICATION: **W1C-02**

SEGMENT NAME: **Planting Island Causeway**

SEGMENT LOCATION: **Marion, Massachusetts** (*Map attached*)

MAXIMUM DEGREE OF INITIAL OILING: Moderate (Oiling Score: 1.64)

SEGMENT INSPECTION STATUS: Segment not inspected as part of IRAC activities. Segment passed MCP IRA inspection on 11/19/2003.

SITE-SPECIFIC INFORMATION

PHYSICAL CHARACTERISTICS:

Primary Shoreline Type/ Geology:

- 1D: Rip rap seawalls, bulkheads, piers, docks, and pilings.

Secondary Shoreline Type/ Geology:

- 1B: Less utilized semi-public and private sand beaches;
- 1C: Mixed sand and gravel, gravel (pebble to boulder), and rip rap groins (jetties); and
- 1F: Salt marshes.

Hydrogeology:

- Sippican Harbor is located to the west, Planting Island Cove to the east, and Buzzards Bay to the southeast. The northern edge of the segment is wetlands and saltwater wetlands.

Bedrock Geology:

- Bedrock underlying this segment is identified as undivided granite, gneiss, and schist (Zen, 1983).

ENVIRONMENTAL SENSITIVE RECEPTORS (Identified within 500 feet of segment):

Aquifer: None at segment.

Protected Open Space: At segment.

Public Ground Water Supply Wells: None at segment.

Public Surface Water Supply Wells: None at segment.

Areas of Critical Environmental Concern (ACEC): None at segment.

Vernal Pools: None at segment.

Priority Habitats of Rare Species: Adjacent to segment: Buzzards Bay aquatic environment.

Estimated Habitats of Rare Wildlife: Adjacent to segment: Buzzards Bay aquatic environment.

Floodplains: At segment: 100-year floodplain.

HUMAN SENSITIVE RECEPTORS (Identified within 500 feet of segment):

Segment Use: Private beach, rocky shore, and marsh. Residential dwellings within 500 feet of the segment. The segment is accessible via roadway.

Frequency of Use: Presumably seasonal and year round residential use.

SUMMARY OF INSPECTION ACTIVITIES

WRF INSPECTIONS

(Wildlife Field Reconnaissance- Shoreline or On-Water Observations; Bird Transect Study.)

WRF inspections pertaining to this segment were not conducted.

NRDA FIELD ACTIVITIES SUMMARY

(Natural Resource Damage Assessment)

Note: Includes Shoreline Cleanup Assessment Team (SCAT) inspections and activities. SCAT forms were completed by field inspection teams working under the direction of Unified Command.

DATE	SUMMARY OF INFORMATION RECORDED BY INSPECTION TEAM
05/15/2003	Tarballs observed along wrack line, very light to light oiling along some mussel beds within marsh. A band of oil coating of tarballs or patties 1 foot wide and 3 feet long with a distribution of less than 1% observed. Several types of wildlife observed. Some areas had a few bands of staining and coating approximately 5 to 20 feet with a distribution of 1% to 10% observed on the rocks along the mid tidal to upper tidal zones, mostly very light to moderate, a few localized heavily oiled rocks noted. A few beaches observed to have a few tarballs and localized oiling at depth. Between East Road, West Road, and Planting Island fork, a band of surface oil residue 10 feet wide and 10 feet long, with 11% to 50% coverage was observed. Near small jetty, oiling was observed within upper and lower marsh sections in the mid tidal zones, and along the rocks near marsh near jetty. A band of oil residue coating 1 foot long and 3 feet wide, with a distribution of 11% to 50% was observed.
05/20/2003	One foot by 20 foot bands of light patchy oiled rocks observed in mid tidal to upper tidal zone with a surface oil coating of tarballs and patties with a distribution of 1% to 10%. Notes indicated that the oiling severity increased to the north along the segment. One dead bird, one dead, oiled horseshoe crab, and several dead skate found. Cleanup crew was on-site during the inspection. Additional cleanup activities were warranted.
05/28/2003	Several areas of heavily oiled rocks observed. Vegetation oiled at the tips observed near N41°68.987' W70°73.587', but field notes indicate that the vegetation appeared healthy.
06/04/2003	Very light sporadic staining, a few patties (3 inches in diameter) were observed in mid tidal to upper tidal zone. Very light subsurface staining and few pieces of oiled wrack also observed. The salt marsh area had approximately less than 1% oil surface coverage. The gravel area of the beach had a surface oil residue with a distribution of less than 1%.

IRAC INSPECTIONS

(Unified Command Immediate Response Action Completion inspections and activities.)

IRAC inspections pertaining to this segment were not conducted.

MCP FIELD ACTIVITIES SUMMARY

(Massachusetts Contingency Plan inspections and activities under the direction of the Licensed Site Professional-of-Record.)

DATE	SUMMARY OF INFORMATION RECORDED BY INSPECTION TEAM
11/19/2003	Site reconnaissance: Splatter (mostly scoured to stain) observed. A small amount of residual splatter was wiped where feasible. Hardened pavement observed between and under large boulders was not removed.

04/20/2005	Site reconnaissance: Trace splatter (primarily scoured to stain or hardened and approximately less than 1-inch in diameter) was observed on boulders along the middle intertidal zone near N41°40.942' W70°43.344'.
05/26/2004	IRA Citizen Call: Resident of 128 Point Road in Marion called GeoInsight concerning residual oil.
05/27/2004	IRA Citizen Call Field Response: Shoreline inspection in response to the 05/26/2004 call to GeoInsight (described above). Tacky splatter (dime-size to 1 inch in diameter) observed sporadically on cobbles in the intertidal zone. The majority of splatter was concentrated primarily in the middle and upper intertidal zones of an area extending approximately 300 yards near 128 Point Road. The majority of the residual oil (up to 2 feet in diameter) observed in between boulders of jetties located in front of 128 Point Road. Few tarballs were found and removed. Additional cleanup activities were warranted.
06/09/2004	Cleanup activities: Consisted of using wire brushes, hand shovels, and cloths to remove residual splatter to at least a stain. Tacky splatter removed in the lower, mid, and upper intertidal zones, and the seawall near 128 Point Road. Residual splatter and pavement (ranging approximately 1 to 12 inches in diameter) removed as much as possible. Very thin, sometimes slightly sticky splatter areas remain on rocks after cleaning, however it was determined that further removal would require solvent use. Oil mixed with sediment was removed under an 18 inch diameter rock, beginning 1 to 2 inches below the surface under cobbles and extending 2 to 12 inches below the surface, and consisted of 2 to 4 inch diameter patties within the impacted area.
08/25/2004	Post-cleanup shoreline inspection: Splatter (scoured to stain) observed where cleanup activities were conducted. In addition, splatter (scoured to stain and approximately 0.5 to 3 inches in diameter) was observed north of the cleanup area along an approximate 100 foot stretch in the middle intertidal zone starting N41°41.239' W70°43.744'. Splatter was sporadic and primarily single droplets. One boulder observed with 20% covered with sheltered tacky splatter in the middle intertidal zone N41°41.412' W70°43.744', and pavement (approximately 12 by 4 inches and 3 inches thick) in between boulders at N41°41.039' W70°43.504' was removed. Additional splatter (scoured to stain) observed south of the cleanup area, primarily in the middle intertidal zone. As part of preliminary Phase II assessment activities, one sediment sample (W1C02-MS01) was collected in an area of stressed marsh vegetation at N41°41.689' W70°44.496', and 2 surface water samples (W1C02-TP01 and W1C02-TP02) were collected from tide pools at N41°41.692' W70°44.489' and N41°41.562' W70°44.428', respectively. Samples were analyzed for EPH fractions and PAH by 8270C SIM analysis.
09/13/2005	Phase II characterization activities: Areas of splatter (primarily dime-size) were observed on cobbles and boulders at N41°40.939' W70°43.283', N41°40.939' W70°43.433', and N41°40.948' W70°43.439'. Splatter was also observed within an approximate 4 by 3 foot area and an approximate 2 foot square area at N41°40.939' W70°43.433' and N41°40.948' W70°43.439', respectively. An area of splatter (4 by 6 inches) was observed at N41°40.961' W70°43.691'. A two foot area with three half-dollar sized splatter at N41°41.201' W70°43.711'. The splatter was weathered and hardened and did not easily come off to the touch. Subtidal sediment samples (W1C02-P2-SUB-01 and W1C02-P2-SUB-02) were collected from two locations adjacent to the segment. The grab samples at each location were collected from within an approximate 15 foot radius of N41°41.592' W70°44.464' and N41°41.369' W70°44.143', respectively. The grab samples were composited in the laboratory and analyzed for EPH fractions and PAH by 8270C/SIM analysis. The salt marsh appeared healthy (approximately 95% green, 5% yellow, and 1% bare spots/algal mats).

Notes:

1. EPH = Extractable Petroleum Hydrocarbons.
2. PAH = Polynuclear Aromatic Hydrocarbons.
3. SIM = Selected Ion Monitoring.

TABLE 1
SAMPLE SUMMARY
BUZZARDS BAY, MASSACHUSETTS
SEGMENT: W1C-02
Planting Island Causeway, Marion

Sample ID	Date Collected	Matrix	Analysis	Laboratory	Sampling Program	Sample Location Coordinates		Sample Location Description	Comments
						Latitude	Longitude		
W1C02-TP01	8/25/2004	Water	PAH EPH	GAI	MCP-At Risk Phase II	N41°41.692'	W70°44.489'	Marsh Tidal Pool	None
W1C02-TP02						N41°41.562'	W70°44.428'		
W1C02-MS01		Sediment				N41°41.689'	W70°44.496'		
W1C02-P2-SUB-1	9/13/2005	Sediment	PAH EPH	GAI	MCP-Phase II Site Assessment	N41°41.590'	W70°44.462'	Subtidal Sediment	Composite Sample
W1C02-P2-SUB-2						N41°41.321'	W70°44.136'		

NOTES:

1. GAI: Groundwater Analytical, Inc.

TABLE 2
SUMMARY OF ANALYTICAL RESULTS
BUZZARDS BAY, MASSACHUSETTS
SEGMENT: W1C-02
Planting Island Causeway, Marion

Analyte	W1C02-TP01	W1C02-TP02	Water Quality Standards	
	Water (Marsh Tidal Pool)	Water (Marsh Tidal Pool)		
	8/25/2004	8/25/2004	MADEP VPH/EPH Surface Water Guideline	NOAA SQiRT Ambient Water Quality Criteria Maximum Concentration
EPH				
C ₉ -C ₁₈ Aliphatic Hydrocarbons	ND(500)	ND(500)	1,800	NA
C ₁₉ -C ₃₆ Aliphatic Hydrocarbons	ND(500)	ND(500)	2,100	NA
C ₁₁ -C ₂₂ Aromatic Hydrocarbons	ND(150)	ND(150)	See Note Below	NA
PAH by GC/MS-SIM by method 8270				
Naphthalene	ND(0.5)	ND(0.5)	NA	2,350
2-Methylnaphthalene	ND(0.5)	ND(0.5)	NA	300
Acenaphthylene	ND(0.5)	ND(0.5)	NA	300
Acenaphthene	ND(0.5)	ND(0.5)	NA	970
Fluorene	ND(0.5)	ND(0.5)	NA	300
Phenanthrene	ND(0.5)	ND(0.5)	NA	7.7
Anthracene	ND(0.5)	ND(0.5)	NA	300
Fluoranthene	ND(0.5)	ND(0.5)	NA	40
Pyrene	ND(0.5)	ND(0.5)	NA	300
Benzo(a)anthracene	ND(0.1)	ND(0.1)	NA	300
Chrysene	ND(0.1)	ND(0.1)	NA	300
Benzo(b)fluoranthene	ND(0.1)	ND(0.1)	NA	300
Benzo(k)fluoranthene	ND(0.1)	ND(0.1)	NA	300
Benzo(a)pyrene	ND(0.1)	ND(0.1)	NA	300
Indeno(1,2,3-cd)pyrene	ND(0.1)	ND(0.1)	NA	300
Dibenzo(a,h)anthracene	ND(0.1)	ND(0.1)	NA	300
Benzo(g,h,i)perylene	ND(0.1)	ND(0.1)	NA	300

NOTES:

1. Results in ug/l (micrograms per liter).
2. EPH: Extractable Petroleum Hydrocarbons.
3. ND(x): Constituent not detected at practical quantitation limits (PQL) noted in parentheses.
4. PAH by GC/MS-SIM: Polynuclear Aromatic Hydrocarbon analysis by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring.
5. j: Estimated concentration/ detected below standard laboratory reporting limits.
6. NA: Not Applicable.
7. Effects for C11-C22 Aromatic Hydrocarbons may be seen at less than the EPH reporting limit.
8. MADEP: Massachusetts Department of Environmental Protection.
9. VPH: Volatile Petroleum Hydrocarbons.

TABLE 2 (continued)
SUMMARY OF ANALYTICAL RESULTS
BUZZARDS BAY, MASSACHUSETTS
SEGMENT: W1C-02
Planting Island Causeway, Marion

Analyte	W1C02-MS01	W1C02-P2-SUB-01	W1C02-P2-SUB-02	MCP Method 1 Standards			Effects Range-Low Benchmarks Marine Sediments
	Marsh Sediment	Subtidal Sediment	Subtidal Sediment	S-1 / GW-1	S-1 / GW-2	S-1 / GW-3	ER-L
	8/25/2004	9/13/2005	9/13/2005				
EPH							
C ₉ -C ₁₈ Aliphatic Hydrocarbons	ND(47)	ND(40)	ND(39)	1,000	1,000	1,000	NA
C ₁₉ -C ₃₆ Aliphatic Hydrocarbons	ND(47)	ND(40)	ND(39)	2,500	2,500	2,500	NA
C ₁₁ -C ₂₂ Aromatic Hydrocarbons	ND(47)	ND(40)	ND(39)	200	800	800	NA
PAH by GC/MS-SIM by method 8270C							
Naphthalene	0.006j	ND(0.017)	ND(0.017)	4	40	500	0.160
2-Methylnaphthalene	0.006j	ND(0.017)	ND(0.017)	4	500	500	0.070
Acenaphthylene	ND(0.016)	ND(0.017)	ND(0.017)	100	100	100	0.044
Acenaphthene	ND(0.016)	ND(0.017)	ND(0.017)	20	1,000	1,000	0.016
Fluorene	ND(0.016)	ND(0.017)	ND(0.017)	400	1,000	1,000	0.019
Phenanthrene	0.006j	ND(0.017)	ND(0.017)	700	1,000	100	0.240
Anthracene	ND(0.016)	ND(0.017)	ND(0.017)	1,000	1,000	1,000	0.085
Fluoranthene	0.014j	ND(0.017)	ND(0.017)	1,000	1,000	1,000	0.600
Pyrene	0.008j	ND(0.017)	ND(0.017)	1,000	1,000	1,000	0.665
Benzo(a)anthracene	ND(0.016)	ND(0.017)	ND(0.017)	7	7	7	0.261
Chrysene	0.006j	ND(0.017)	ND(0.017)	7	7	7	0.384
Benzo(b)fluoranthene	0.006j	ND(0.017)	ND(0.017)	7	7	7	NA
Benzo(k)fluoranthene	0.005j	ND(0.017)	ND(0.017)	70	70	70	NA
Benzo(a)pyrene	0.005j	ND(0.017)	ND(0.017)	2	2	2	0.430
Indeno(1,2,3-cd)pyrene	ND(0.016)	ND(0.017)	ND(0.017)	7	7	7	NA
Dibenzo(a,h)anthracene	ND(0.016)	ND(0.017)	ND(0.017)	0.7	0.7	0.7	0.063
Benzo(g,h,i)perylene	ND(0.016)	ND(0.017)	ND(0.017)	1,000	1,000	1,000	NA

NOTES:

1. Results in mg/Kg (milligrams per kilogram).
2. EPH: Extractable Petroleum Hydrocarbons.
3. ND(x): Constituent not detected at practical quantitation limits (PQL) noted in parentheses.
4. PAH by GC/MS-SIM: Polynuclear Aromatic Hydrocarbon analysis by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring.
5. j: Estimated concentration/ detected below standard laboratory reporting limits.
6. Bold values exceed laboratory PQL.
7. ER-L: Effects Range Low (Long and Morgan 1991).
8. NA: Not Applicable.
9. MCP: Massachusetts Contingency Plan.



W1C-02

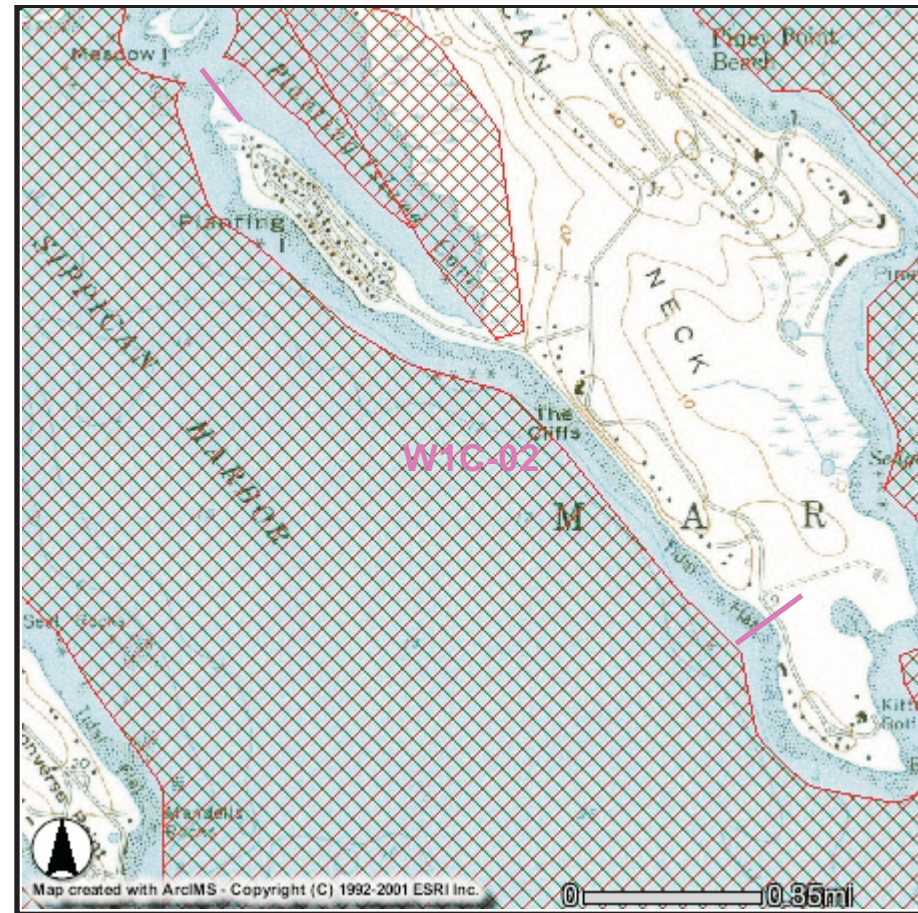
0 500 1,000 2,000 Feet



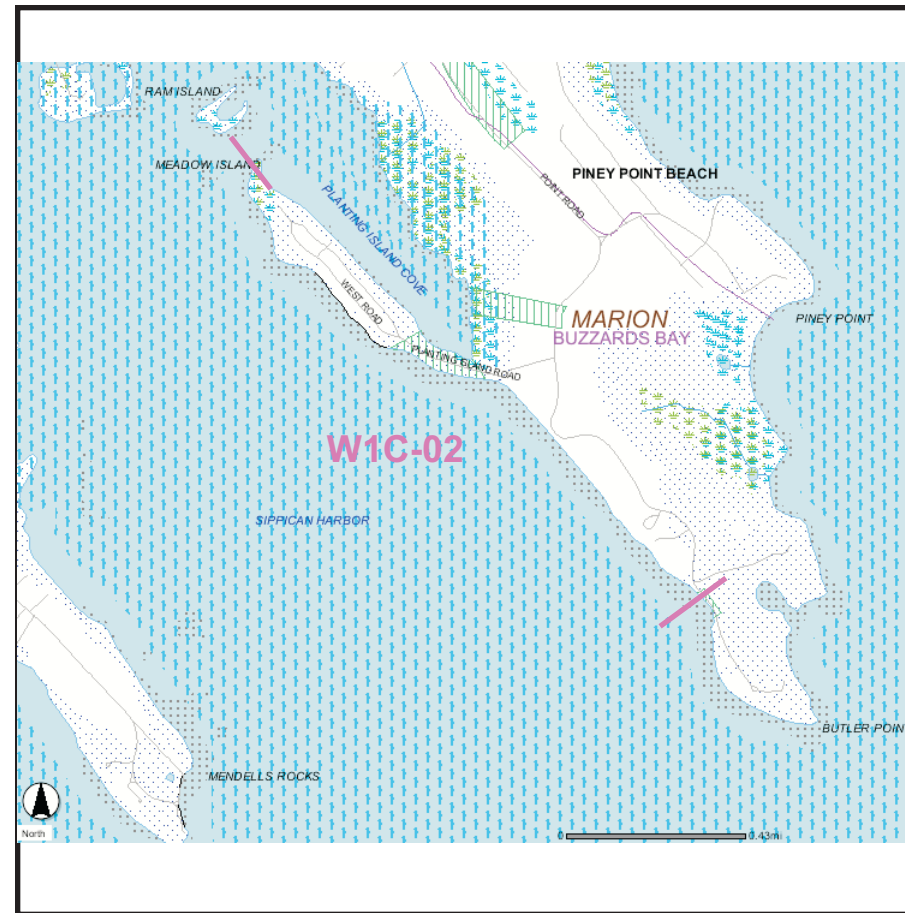
E N T R I X

W1C-02
Planting Island Causeway
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

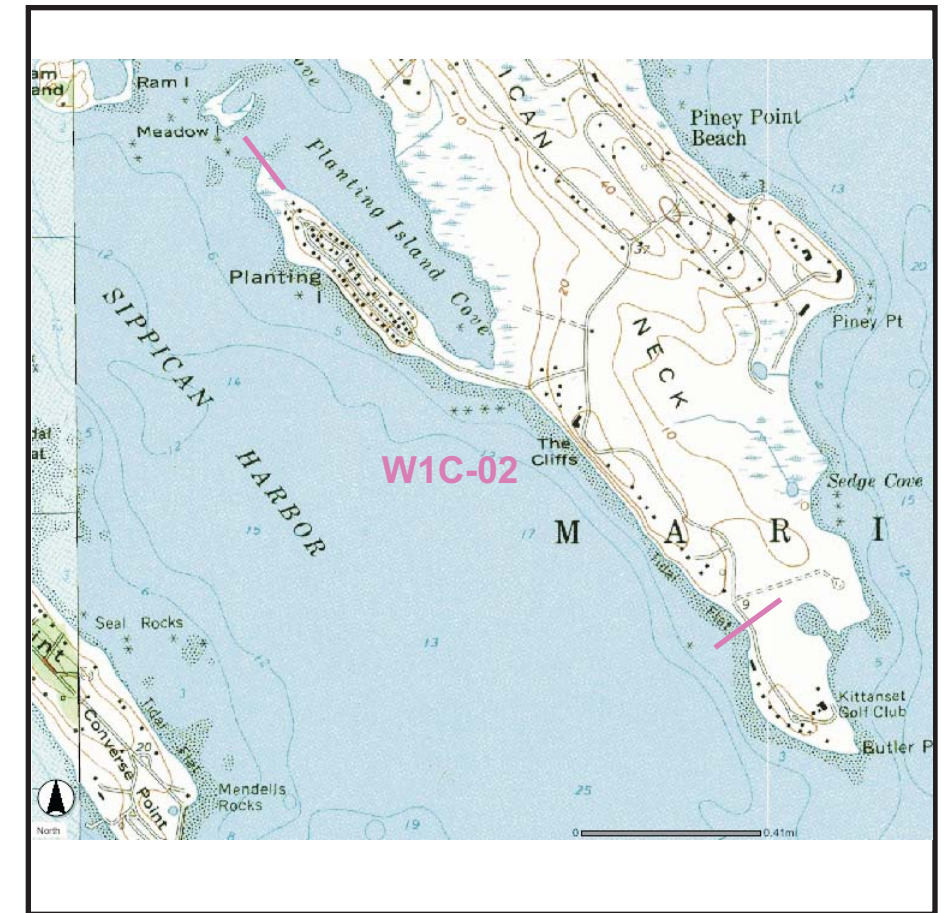
NATURAL HERITAGE AND ENDANGERED SPECIES MAP





21E PRIORITY RESOURCE MAP



























TOPOGRAPHIC MAP




LEGEND

-  NHESP 2005 MA PRIORITY HABITATS FOR STATE-PROTECTED RARE SPECIES
-  NHESP 2005 MA ESTIMATED HABITATS OF RARE WILDLIFE

DEP MCP 21e Map Legend

-  Zone IIs
 -  IWPAs
 -  Zone A
 -  Sole Source Aquifers
 -  Solid Waste Sites
 -  Protected Openspace
 -  ACECs
 -  NHESP Estimated Habitat of Rare Wildlife in Wetland Areas
 -  Certified Vernal Pools 2003 NHESP
 -  Subbasins
 -  Mass Major Basins
 -  DEP Region
 - Town Arcs
 - County Boundaries
-  HIGH YIELD
 -  MEDIUM YIELD
 -  Non Potential Drinking Water Source Area
 -  HIGH YIELD
 -  MEDIUM YIELD
 -  FEMA Floodplains
 -  100 YEAR FLOODPLAIN
-  WATER
 -  RESERVOIR
 -  WETLANDS
 -  SALT WATER WETLANDS
 -  FLATS, SHOALS
 -  PERENNIAL
 -  INTERMITTENT
 -  SHORELINE
 -  MAN MADE SHORE
 -  DAM
 -  AQUEDUCT
-  LIMITED ACCESS HIGHWAY
 -  MULTILANE HWY, NOT LIMITED ACCESS
 -  OTHER NUMBERED HWY
 -  MAJOR ROAD - COLLECTOR
 -  MINOR STREET OR ROAD, RAMP
 -  TRACK
 -  TRAIL
 -  PIPELINE
 -  POWERLINE
 -  TRAIN



		PROJECT:		
		B120 OIL SPILL		
TITLE:		LOCATION:		
		PLANTING ISLAND CAUSEWAY BUZZARDS BAY, MA		
PHASE II SUPPORTING MAPS				
DESIGNED:	DRAWN:	CHECKED:	APPROVED:	FIGURE #:
LAC	JKB	KDT	MJW	
SCALE:	DATE:	FILE:	PROJECT #:	WIC-02
AS SHOWN	01/25/06	3871WIC-02	3871-002	



Map Document: (J:\Ar\view\7079607 - BuzzardsBaySpill\Geoinsight\Report 1-05\Shoreline Segment Summary rev RR 6-06-06.mxd)

Trench Location

- 11/2004
- 10/2004
- 09/2004
- 08/2004
- 07/2004
- 06/2004
- 04/2004
- 03/2004
- 01/2004
- 12/2003
- 11/2003
- 10/2003
- 09/2003
- ✿ Nearshore Subtidal Sediment Sampling Location 2004
- ✿ Deep Subtidal Sediment Sampling Location 2004
- ✿ Subtidal Sediment Sampling Location 2003
- ▲ Qualitative Shellfish Surveys 2004
- ◆ Marsh Sampling Location 2004
- ◆ Marsh Core Sampling Location 2004
- Water Sampling Location 2004
- Water Sampling Location 2003
- ★ Intertidal Sediment Sampling Location 2003
- ★ Intertidal Sediment Sampling Location 2004

- ✦ Shellfish Sampling Location
- ▶ Chain Drag Location 2003
- ▶ Chain Drag Location 2004
- ⦿ Lobster Pot Sampling Location 2003
- ⦿ Absorbent Pad Sampling Location 2003
- ⊗ Dive Sites
- ⊗ Wetlands
- ⦿ Nests
- ⊕ Vernal Pool
- ⊗ NHESP 2003 Priority Habitats for State-Protected Rare Species

OILING

- NO DATA
- CLEAN
- VERY LIGHT
- LIGHT
- MEDIUM
- HEAVY

IRAC ESI

- Public-Private Sand Beach (1A/1B)
- Mixed Sand and Gravel (1C)
- Marsh (1F)
- Rocky Shoreline (1E)
- Riprap, Groin, Jetty (1D)
- Visual Inspection of Marsh Area

0 500 1,000 Feet



ENTRIX

W1C-02
Planting Island Causeway, Marion
Comprehensive Activities
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Segment: W1C-02 Planting Island Causeway

Marion, MA

Phase II Sampling: September 13, 2005



Photo 1: Overview of shoreline type.



Photo 2: Overview of shoreline type.

Segment: W1C-02 Planting Island Causeway
Marion, MA
Phase II Sampling: September 13, 2005



Photo 3: Small patches of splatter observed on cobble.



Photo 4: Shoreline transition from cobble to marsh.