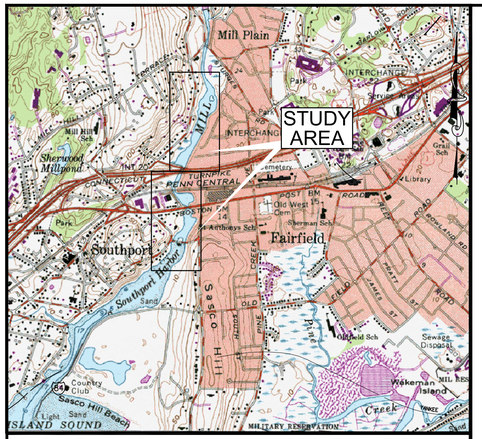

VICINITY MAP SCALE: N.T.S.

PROJECT DRAWINGS

REMEDIAL ACTION PLAN
for
LEAD IMPACTED RIVER SEDIMENTS
MILL RIVER STUDY AREAS I–V
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 POST ROAD, FAIRFIELD, CONNECTICUT
FAIRFIELD, CONNECTICUT

LIST OF DRAWINGS

SHEET	TITLE
1	INVENTORY OF PHYSICAL FEATURES, AREAS I–IV
2	INVENTORY OF PHYSICAL FEATURES, AREA V
3	WATER COLUMN THICKNESS AT OBSERVED LOW WATER ELEVATION, AREAS I–IV
4	WATER COLUMN THICKNESS AT OBSERVED LOW WATER ELEVATION, AREA V
5	FINAL INTENDED DREDGING DEPTHS (IN FT. BELOW RIVER BOTTOM), AREAS I–IV
6	FINAL INTENDED DREDGING DEPTHS (IN FT. BELOW RIVER BOTTOM), AREA V
7	DREDGE PRISMS ILLUSTRATING LEAD CONCENTRATION AT DEPTH AREAS III–IV
8	DREDGE PRISMS ILLUSTRATING LEAD CONCENTRATION AT DEPTH AREAS I–II
9	DREDGE PRISMS ILLUSTRATING LEAD CONCENTRATION AT DEPTH AREA V
10	DREDGING DEPTHS CROSS SECTION, AREA II, STATIONS 15+00 TO 15+75
11	EDGE OF MILL RIVER SURVEY STUDY AREAS I–IV SHOWING FEDERAL WETLANDS
12	EDGE OF MILL RIVER SURVEY STUDY AREA V SHOWING FEDERAL WETLANDS
13	POTENTIAL REMEDIATION CELL LAYOUT NON–RESTRICTIVE OF ANADROMOUS FISH RUNS, MILL RIVER STUDY AREAS I–IV
14	POTENTIAL REMEDIATION CELL LAYOUT NON–RESTRICTIVE OF ANADROMOUS FISH RUNS, MILL RIVER STUDY AREA V
15	PROPOSED POST REMEDIATION CONFIRMATION SAMPLE LOCATIONS AREAS I–IV
16	PROPOSED POST REMEDIATION CONFIRMATION SAMPLE LOCATIONS AREA V

PREPARED FOR

EXIDE GROUP INCORPORATED

C/O VALE CANADA LIMITED

200 BAY STREET, SUITE 1500 - SOUTH TOWER

TORONTO, ONTARIO

CANADA M5J 2K2

PREPARED BY:

ENVIRONMENTAL - CIVIL - ENGINEERING - SURVEYING - CCA LLC

40 OLD NEW MILFORD ROAD
BROOKFIELD, CONNECTICUT

PREPARED APRIL 2012

JOB # 8014.03

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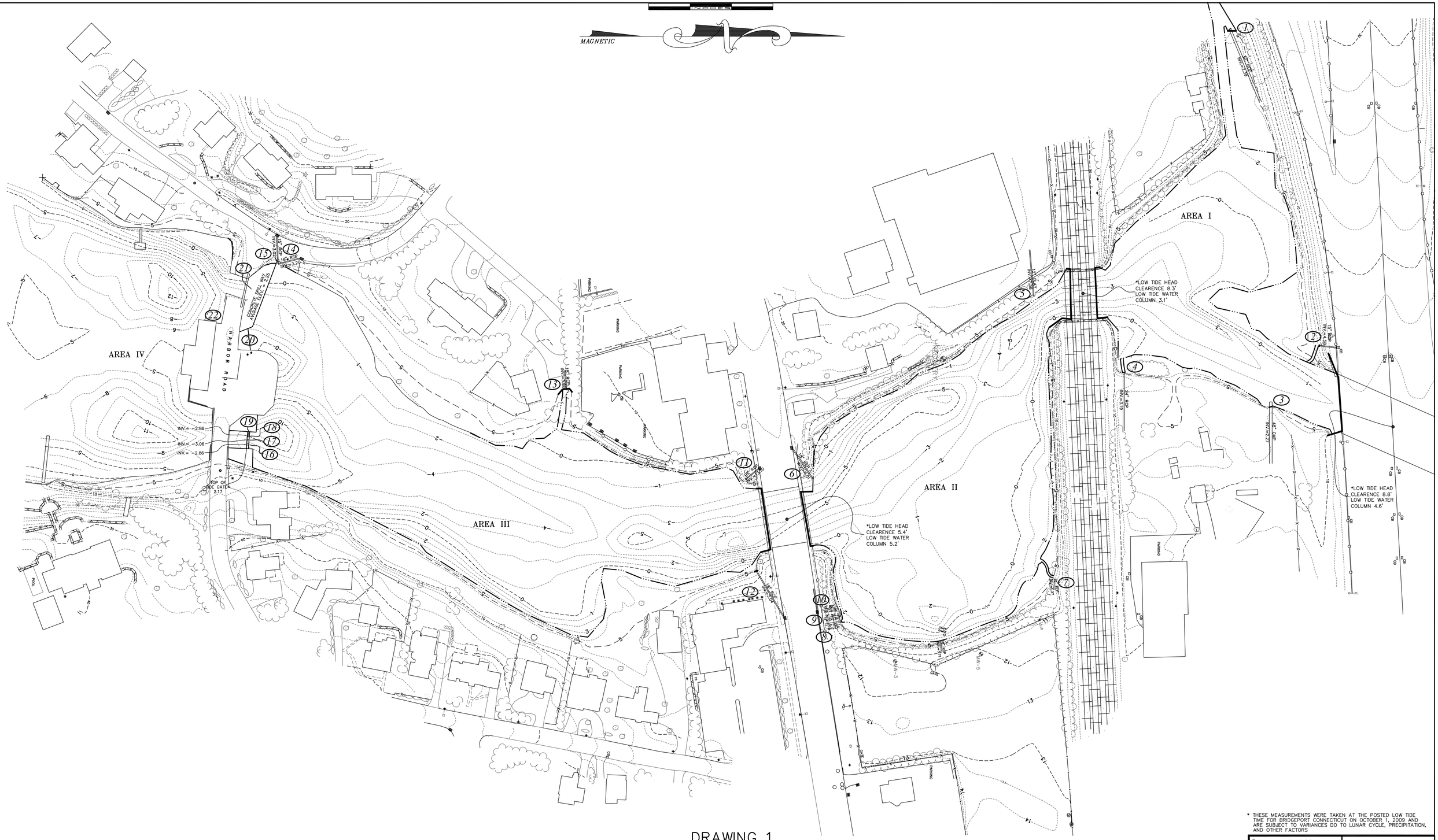

DRAWING 1
INVENTORY OF PHYSICAL FEATURES
MILL RIVER STUDY AREAS I–IV
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

* THESE MEASUREMENTS WERE TAKEN AT THE POSTED LOW TIDE TIME FOR BRIDGEPORT CONNECTICUT ON OCTOBER 1, 2009 AND ARE SUBJECT TO VARIANCES DO TO LUNAR CYCLE, PRECIPITATION, AND OTHER FACTORS

NOTES:
- ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR. 2003
- RIVER BOTTOM CONTOUR DATA AS FIELD MEASURED DURING 2008/2009 SEDQAPP IMPLEMENTATION

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

EXISTING CONTOURS

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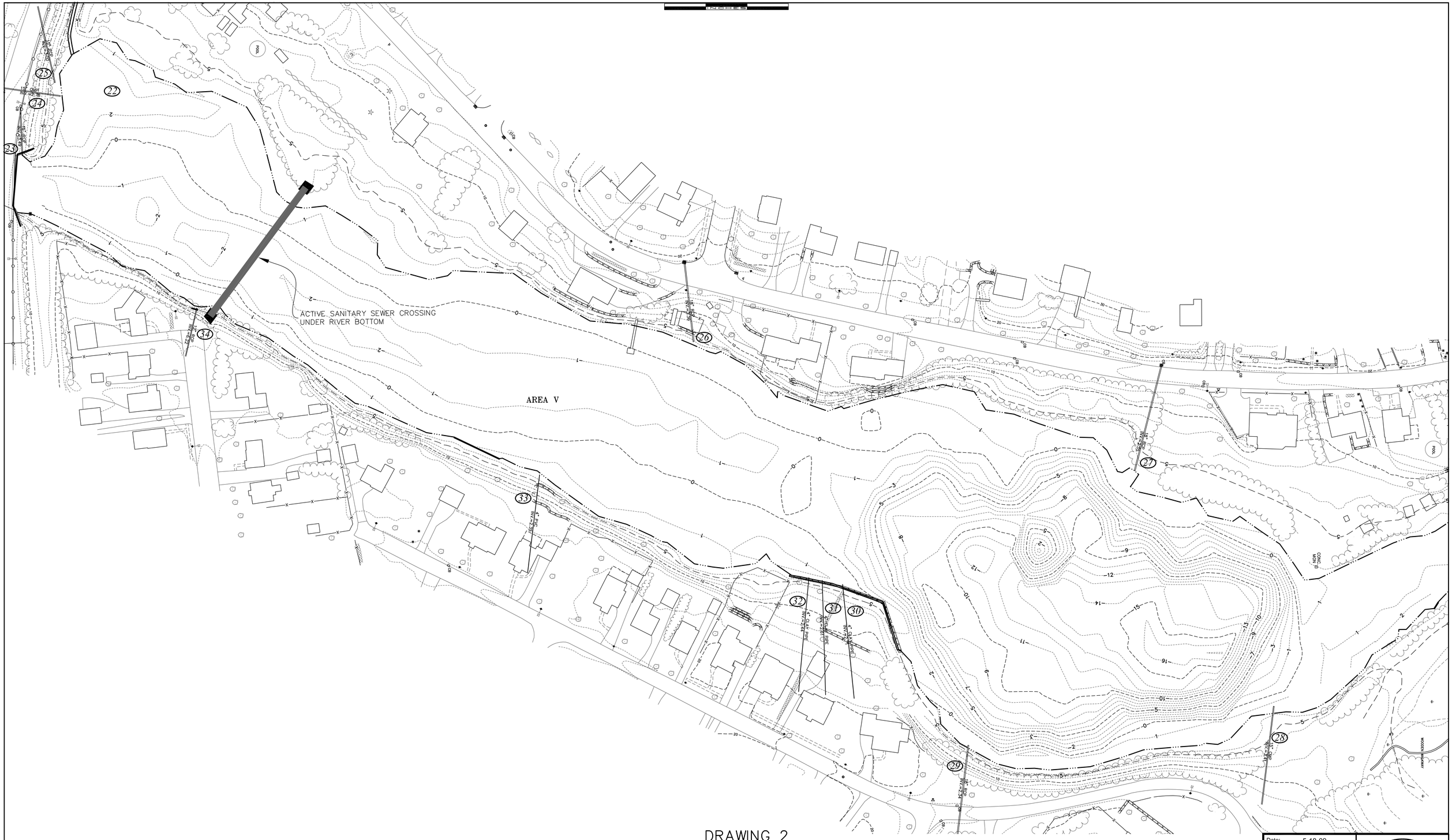

DRAWING 2
INVENTORY OF PHYSICAL FEATURES
MILL RIVER STUDY AREAS I–IV
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

NOTES:
- ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003
- RIVER BOTTOM CONTOUR DATA AS FIELD MEASURED DURING 2008/2009 SEDQAPP IMPLEMENTATION

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

EXISTING CONTOURS

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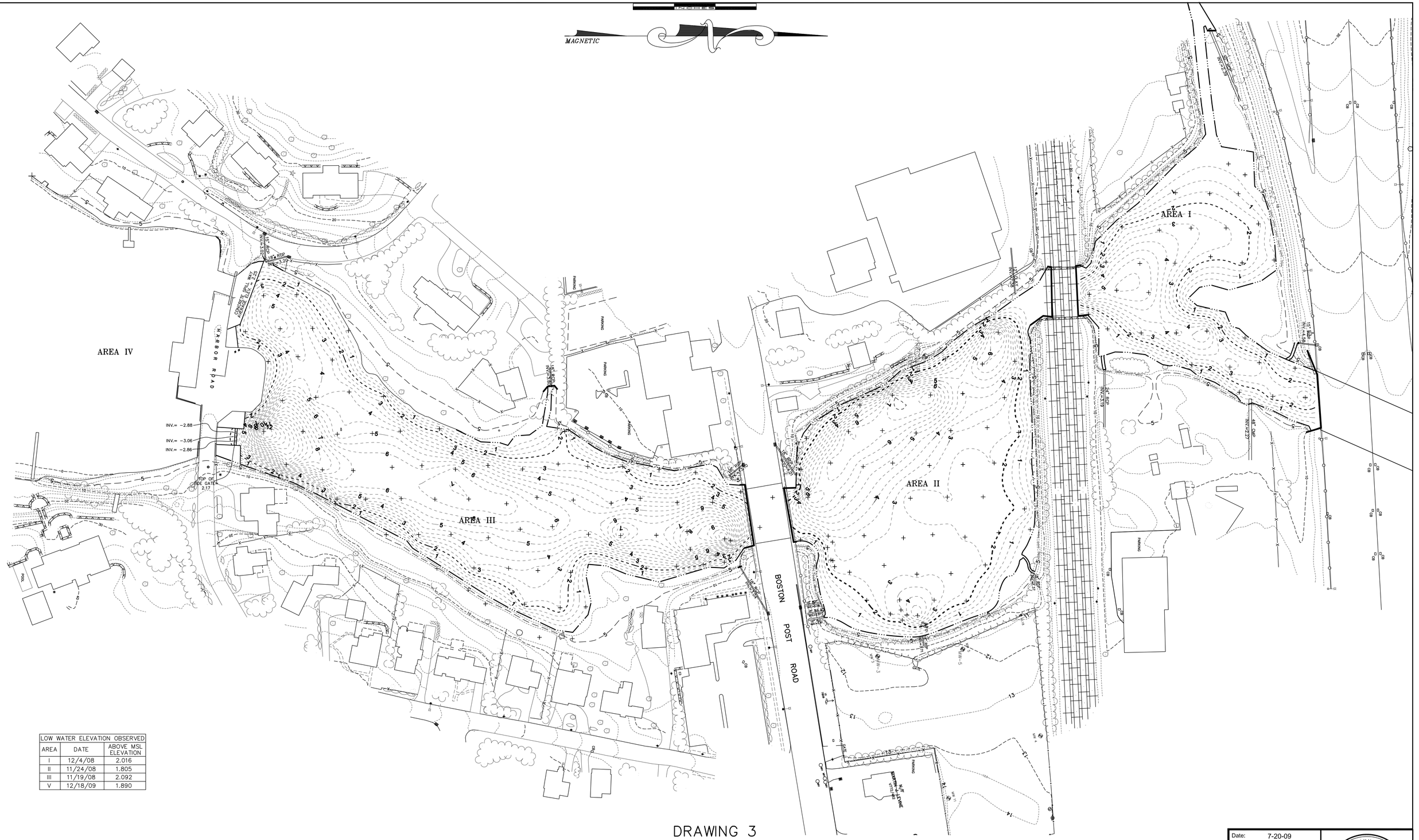

LOW WATER ELEVATION OBSERVED		
AREA	DATE	ABOVE MSL ELEVATION
I	12/4/08	2.016
II	11/24/08	1.805
III	11/19/08	2.092
V	12/18/09	1.890

*LOW SURFACE WATER ELEVATION OBSERVED DURING 2008–2009 SEDIMENT QAPP IMPLEMENTATION

SAMPLE LOCATIONS +

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

WATER COLUMN THICKNESS AT OBSERVED LOW SURFACE WATER ELEVATION 3

NOTE: ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003

DRAWING 3
MILL RIVER WATER COLUMN THICKNESS AT OBSERVED LOW WATER ELEVATION*
MILL RIVER STUDY AREAS I–IV
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

Date:	7-20-09
Scale:	1"=60'
Proj. No.:	98-8014
File No.:	2048
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MAGNETIC

AREA V

LOW WATER ELEVATION OBSERVED		
AREA	DATE	ABOVE MSL ELEVATION
I	12/4/08	2.016
II	11/24/08	1.805
III	11/19/08	2.092
V	12/18/09	1.890

*LOW SURFACE WATER ELEVATION OBSERVED DURING 2008–2009 SEDIMENT QAPP IMPLEMENTATION

SAMPLE LOCATIONS +

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

WATER COLUMN THICKNESS AT OBSERVED LOW SURFACE WATER ELEVATION 3

NOTE: ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003

DRAWING 4
MILL RIVER WATER COLUMN THICKNESS AT OBSERVED LOW WATER ELEVATION*
MILL RIVER STUDY AREA V
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

Date:	5-18-09
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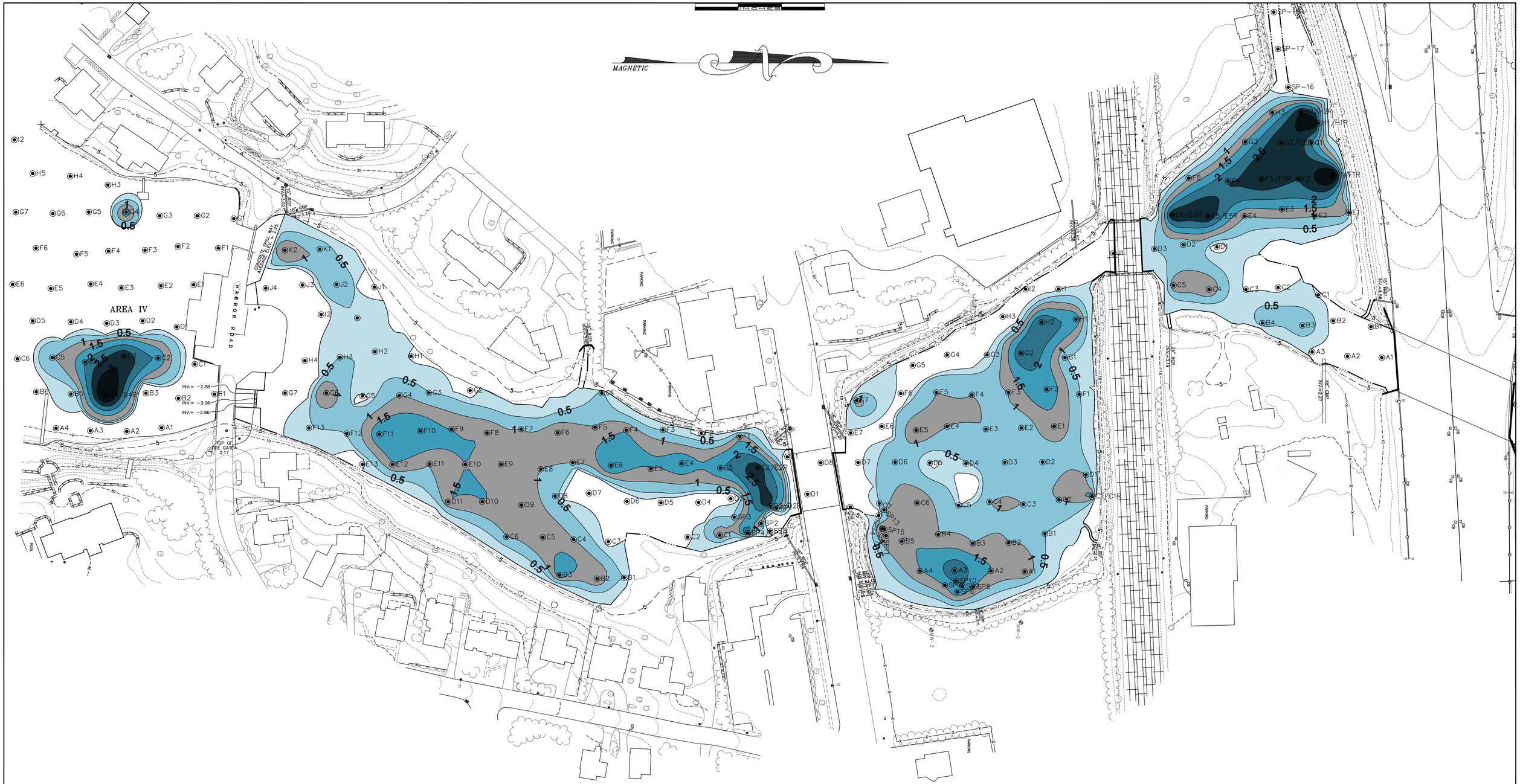

DRAWING 5
FINAL INTENDED DREDGING DEPTHS (IN FT. BELOW RIVER BOTTOM)
AREAS I–IV CLEANUP CRITERIA OF 220 mg/kg LEAD IN SEDIMENT
MILL RIVER STUDY AREAS I–IV
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

AREAS I–IV 220 mg/kg PRG
- 0.0' – 0.5' DEPTH
- 0.5' – 1.0' DEPTH
- 1.0' – 1.5' DEPTH
- 1.5' – 2.0' DEPTH
- 2.0' – 2.5' DEPTH
- 2.5' – 3.0' DEPTH
- 3.0' & > DEPTH

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

NOTE: ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYS DATED APR, 2003

Date:	12-20-10
Scale:	1"=60'
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MAGNETIC

AREA V

DRAWING 6
FINAL INTENDED DREDGING DEPTHS (IN FT. BELOW RIVER BOTTOM)
AREA V CLEANUP CRITERIA OF 400 mg/kg LEAD IN SEDIMENT
MILL RIVER STUDY AREA V
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

AREA V 400 mg/kg PRG

0.0' – 0.5' DEPTH	
0.5' – 1.0' DEPTH	
1.0' – 1.5' DEPTH	
1.5' – 2.0' DEPTH	
2.0' – 2.5' DEPTH	
2.5' – 3.0' DEPTH	
3.0' & > DEPTH	

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

NOTE: ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYS DATED APR, 2003

Date	Revision
11-7-11	ADDED DREDGING DEPTH AT K9

Date:	12-20-10
Scale:	1"=60'
Proj. No.:	98-8014
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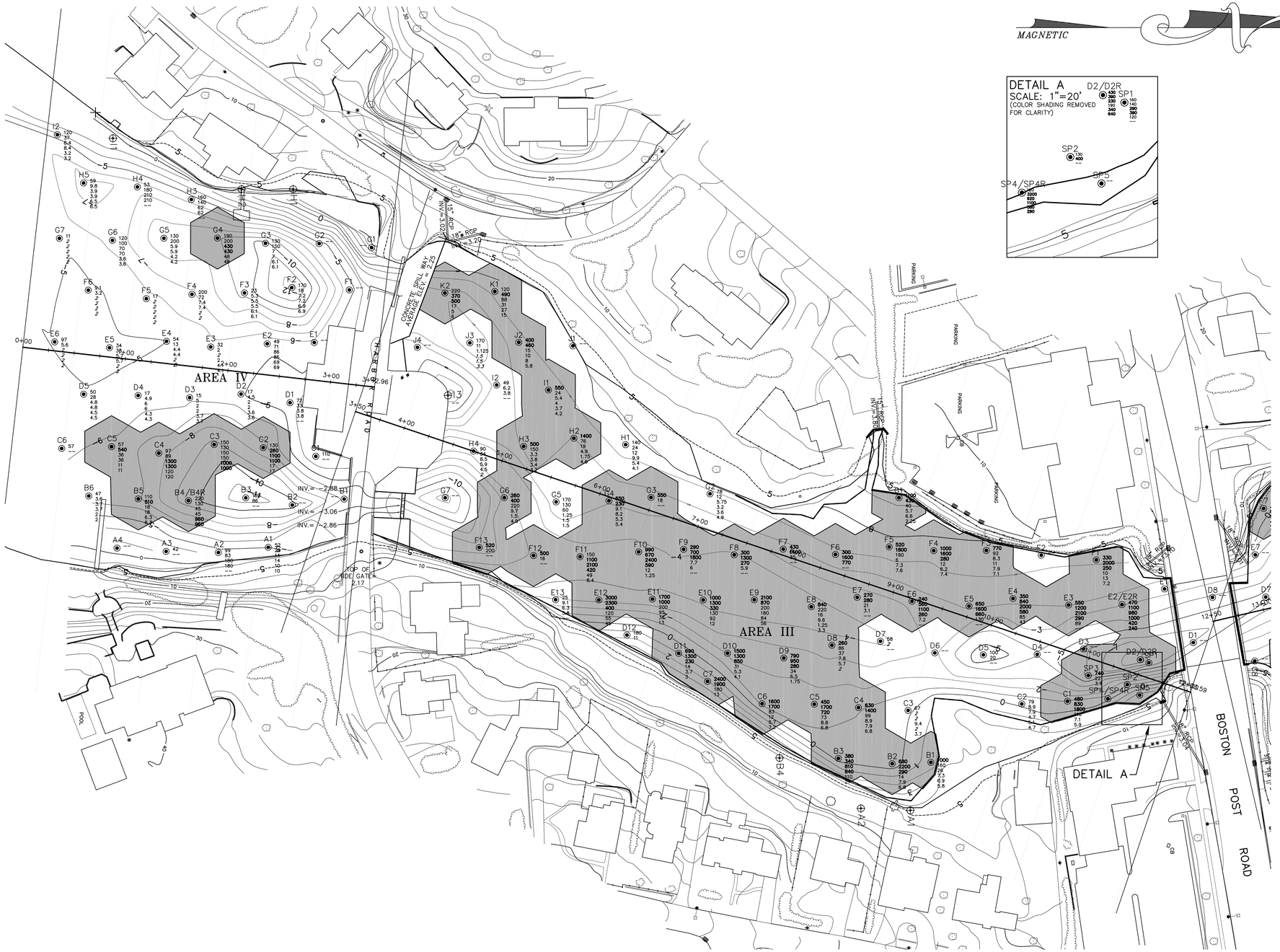

DRAWING 7
DREDGE PRISMS AREAS III & IV
ILLUSTRATING LEAD CONCENTRATION AT DEPTH
(ALSO SHOWING CROSS SECTION BASELINE AND STATIONS)
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENT
MILL RIVER STUDY AREAS I–V
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

NOTES:
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- RIVER BOTTOM CONTOUR DATA AS FIELD MEASURED DURING 2008/2009 SEDQAPP IMPLEMENTATION
- ALL ELEVATION DATUM BASED ON NVGD29 DATUM

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

EXISTING CONTOURS

MATERIAL TO BE REMOVED

SEDIMENT CORE SAMPLE LOCATION/ID
2008–2009 SEDIMENT SAMPLING PROGRAM

5-2-12	Post Final Update
Date	Revision

Date:	1-27-12
Scale:	1" = 50'
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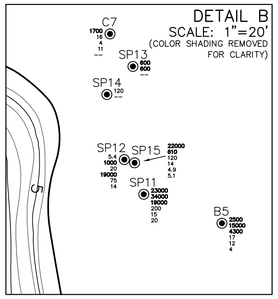

DRAWING 8
DREDGE PRISMS AREAS I & II
ILLUSTRATING LEAD CONCENTRATION AT DEPTH
(ALSO SHOWING CROSS SECTION BASELINE AND STATIONS)
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENT
MILL RIVER STUDY AREAS I–V
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

NOTES:
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- RIVER BOTTOM CONTOUR DATA AS FIELD MEASURED DURING 2008/2009 SEDQAPP IMPLEMENTATION
- ALL ELEVATION DATUM BASED ON NVGD29 DATUM

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

EXISTING CONTOURS

MATERIAL TO BE REMOVED

SEDIMENT CORE SAMPLE LOCATION/ID 2008–2009 SEDIMENT SAMPLING PROGRAM

5-2-12	Post Final Update
Date	Revision

Date:	1-27-12
Scale:	1" = 50'
Proj. No.:	98-8014
File No.:	2048
Acad No.:	98814HD
Sheet:	8

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DRAWING 9R
DREDGE PRISMS AREA V
ILLUSTRATING LEAD CONCENTRATION AT DEPTH
(ALSO SHOWING CROSS SECTION BASELINE AND STATIONS)
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENT
MILL RIVER STUDY AREAS I–V
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

NOTES:
- ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003
- RIVER BOTTOM CONTOUR DATA AS FIELD MEASURED DURING 2008/2009 SEDQAPP IMPLEMENTATION
- ALL ELEVATION DATUM BASED ON NVGD29 DATUM

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

EXISTING CONTOURS –2–

MATERIAL TO BE REMOVED

SEDIMENT CORE SAMPLE LOCATION/ID
2008–2009 SEDIMENT SAMPLING PROGRAM
E9 2100 200 180

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6-26-13	ADDED DREDGE PRISM AT F17
Date	Revision

Date:	1-27-12
Scale:	1" = 100'
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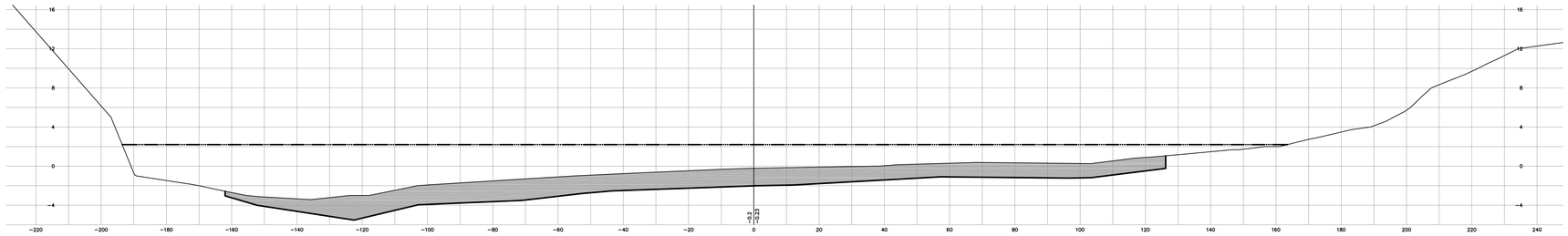
15+75



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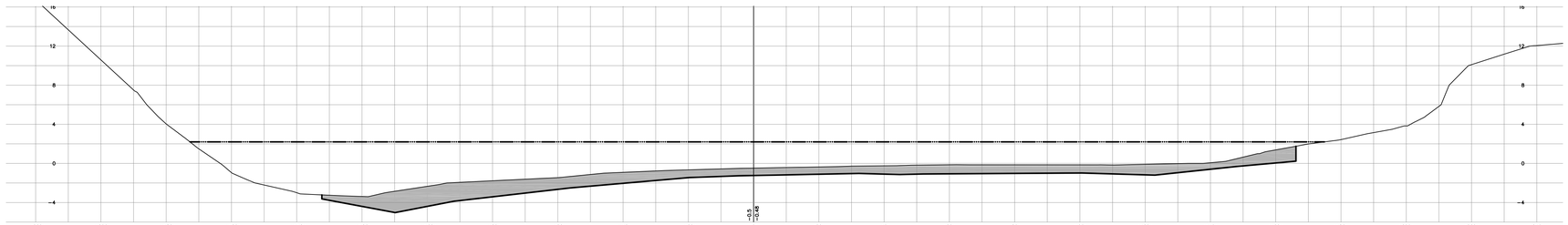
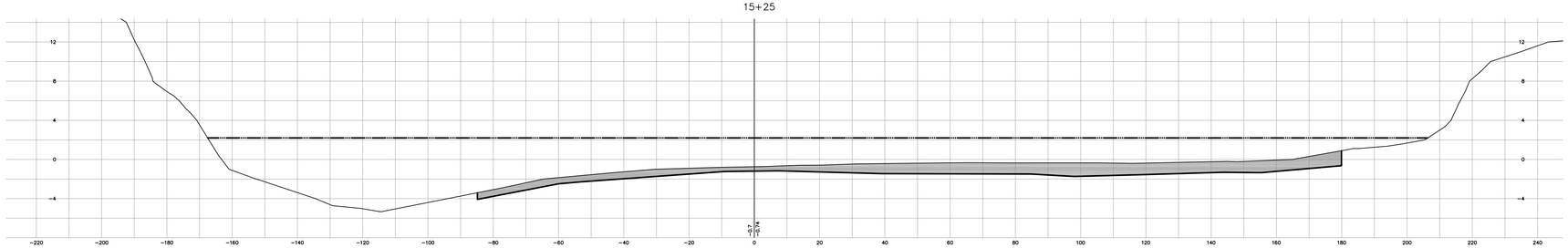


15+25



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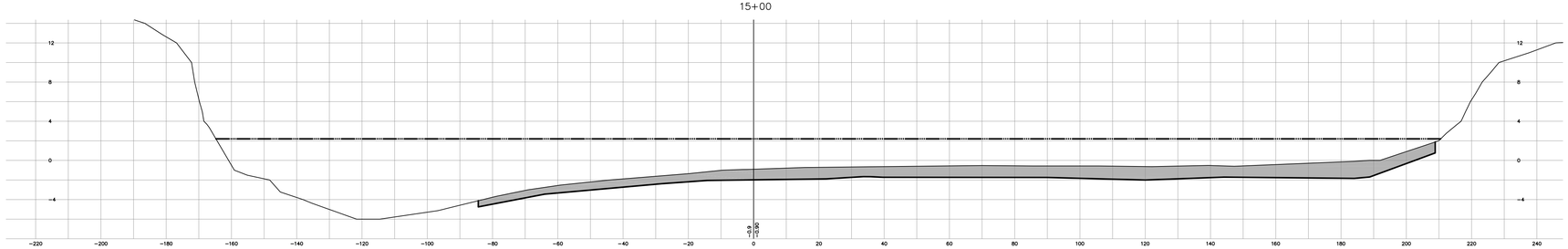

LEGEND

EXISTING GRADE

PROPOSED DREDGING

SURFACE OF WATER

MATERIAL TO BE REMOVED

DRAWING 10
DREDGING DEPTH CROSS SECTIONS
AREA II–STATIONS 15+00 TO 15+75
ILLUSTRATING INTENDED DREDGE DEPTH
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENT
MILL RIVER STUDY AREAS I–V
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT
SCALE: HORZ. 1"=20'
VERT. 1"=6'

Date:	1-27-12
Scale:	AS NOTED
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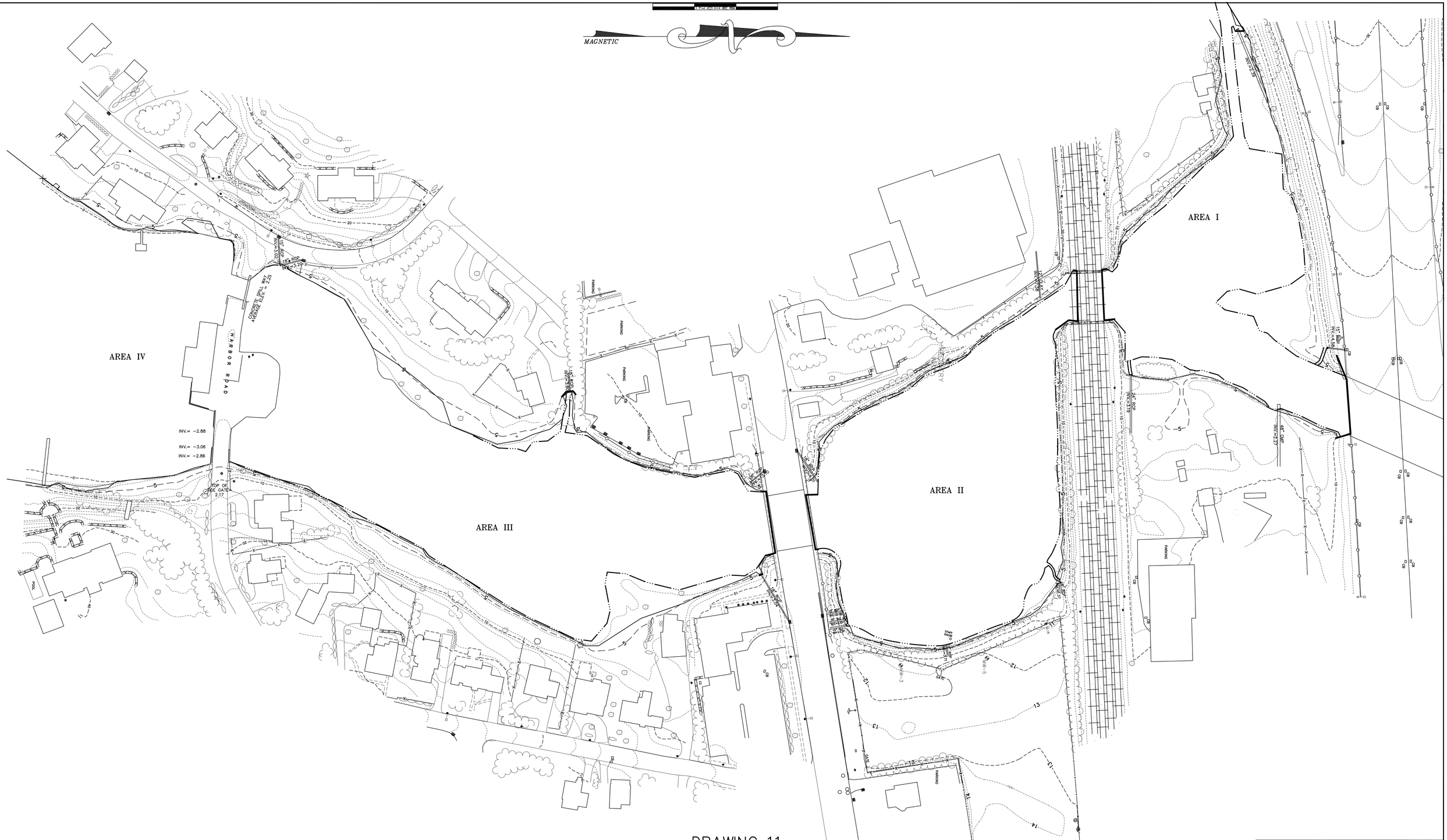

DRAWING 11
EDGE OF MILL RIVER SURVEY
STUDY AREAS I–IV
SHOWING FEDERAL WETLANDS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

NOTES:
– ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003

WETLANDS DELINEATED BY ENVIRONMENTAL PLANNING SERVICES, MARCH 2009

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

EXISTING CONTOURS 8

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AREA V

NOTES:
- ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003

WETLANDS DELINEATED BY ENVIRONMENTAL PLANNING SERVICES, MARCH 2009

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

EXISTING CONTOURS 8

DRAWING 12
EDGE OF MILL RIVER SURVEY
STUDY AREA V
SHOWING FEDERAL WETLANDS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

Date:	5-18-09
Scale:	1"=60'
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NOTE:

THE ISOPLETHS DEPICTED IN-RIVER WERE CREATED THUSLY:

THE DAY, PER RIVER REACH, WHERE THE LOWEST WATER SURFACE ELEVATION DATA WAS MEASURED VIA GPS IN THE SAMPLING BOAT (DURING THE 2008-2009 SEDQAPP SAMPLING EFFORT) WAS SELECTED AS REPRESENTATIVE OF LOW WATER ELEVATION (SEE TABLE). THIS NUMBER (TIED TO NVGD29 DATUM) WAS THEN USED TO CALCULATE THE MINIMUM WATER THICKNESS AT EACH POINT IN THE REACH BY SUBTRACTING THE MANUALLY (FIELD) MEASURED WATER COLUMN THICKNESS AND ADJUSTING THE LOW WATER ELEVATION NUMBER TO THE ACTUAL ELEVATION NUMBER AT EACH POINT. THE ISOPLETHS WERE THEN DRAWN AROUND THESE DATA POINTS.

THE VALUES PRESENTED THEREFORE ARE REPRESENTATIVE OF MINIMUM WATER COLUMN THICKNESS FOR THE DATES NOTED AND ARE NOT TO BE CONSTRUED AS BOTTOM CONTOURS. THE PURPOSE OF THIS DRAWING IS TO SHOW LIKELY MINIMUM WATER SCENARIOS AS THEY APPLY TO ANADROMOUS FISH PASSAGE AND MINIMUM DRAFT REQUIREMENTS OF DREDGING EQUIPMENT.

LOW WATER ELEVATION OBSERVED		
AREA	DATE	ELEVATION (NVGD 29)
I	12/4/08	2.016
II	11/24/08	1.805
III	11/19/08	2.092
V	12/18/08	1.890

LEAD (mg/kg) 220 – 400

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

WATER COLUMN THICKNESS CALCULATED BASED ON OBSERVED LOW SURFACE WATER ELEVATION DURING 2008-2009 SEDIMENT QAPP IMPLEMENTATION

TURBIDITY CURTAIN ORIENTATION

NOTE: ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003 AND BASED ON NVGD 29

DRAWING 13
POTENTIAL DREDGE CELL LAYOUT
NON-RESTRICTIVE OF ANADROMOUS FISH RUNS
MILL RIVER STUDY AREAS I-IV
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

Date:	12-20-2010
Scale:	1"=60'
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NORTH

MAGNETIC

CELL #1

NO DREDGING REQUIRED

CELL #2

CELL #3

AREA V

CELL #4

NO DREDGING REQUIRED

CELL #5

CELL #6

NO DREDGING REQUIRED

CELL #7

NOTE:

THE ISOPLETHS DEPICTED IN-RIVER WERE CREATED THUSLY:

THE DAY, PER RIVER REACH, WHERE THE LOWEST WATER SURFACE ELEVATION DATA WAS MEASURED VIA GPS IN THE SAMPLING BOAT (DURING THE 2008-2009 SEDQAPP SAMPLING EFFORT) WAS SELECTED AS REPRESENTATIVE OF LOW WATER ELEVATION (SEE TABLE). THIS NUMBER (TIED TO NVGD29 DATUM) WAS THEN USED TO CALCULATE THE MINIMUM WATER THICKNESS AT EACH POINT IN THE REACH BY SUBTRACTING THE MANUALLY (FIELD) MEASURED WATER COLUMN THICKNESS AND ADJUSTING THE LOW WATER ELEVATION NUMBER TO THE ACTUAL ELEVATION NUMBER AT EACH POINT. THE ISOPLETHS WERE THEN DRAWN AROUND THESE DATA POINTS.

THE VALUES PRESENTED THEREFORE ARE REPRESENTATIVE OF MINIMUM WATER COLUMN THICKNESS FOR THE DATES NOTED AND ARE NOT TO BE CONSTRUED AS BOTTOM CONTOURS. THE PURPOSE OF THIS DRAWING IS TO SHOW LIKELY MINIMUM WATER SCENARIOS AS THEY APPLY TO ANADROMOUS FISH PASSAGE AND MINIMUM DRAFT REQUIREMENTS OF DREDGING EQUIPMENT.

LOW WATER ELEVATION OBSERVED		
AREA	DATE	ELEVATION (NVGD 29)
I	12/4/08	2.016
II	11/24/08	1.805
III	11/19/08	2.092
V	12/18/08	1.890

LEAD (mg/kg) > 400

EDGE OF WATER PER FIELD SURVEY BY CCA LLC JAN, 2009

WATER COLUMN THICKNESS CALCULATED BASED ON OBSERVED LOW SURFACE WATER ELEVATION DURING 2008-2009 SEDIMENT QAPP IMPLEMENTATION — 3

TURBIDITY CURTAIN ORIENTATION

NOTE: ALL EXISTING PHYSICAL FEATURES SHOWN HEREON AS PER GOLDEN AERIAL SURVEYORS DATED APR, 2003 AND BASED ON NVGD 29

DRAWING 14
POTENTIAL DREDGE CELL LAYOUT
NON-RESTRICTIVE OF ANADROMOUS FISH RUNS
MILL RIVER STUDY AREA V
REMEDIAL ACTION PLAN FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

Date:	12-20-10
Scale:	1"=60'
Proj. No.:	98-8014
File No.:	2048
Acad No.:	988014-SURV
Sheet:	14

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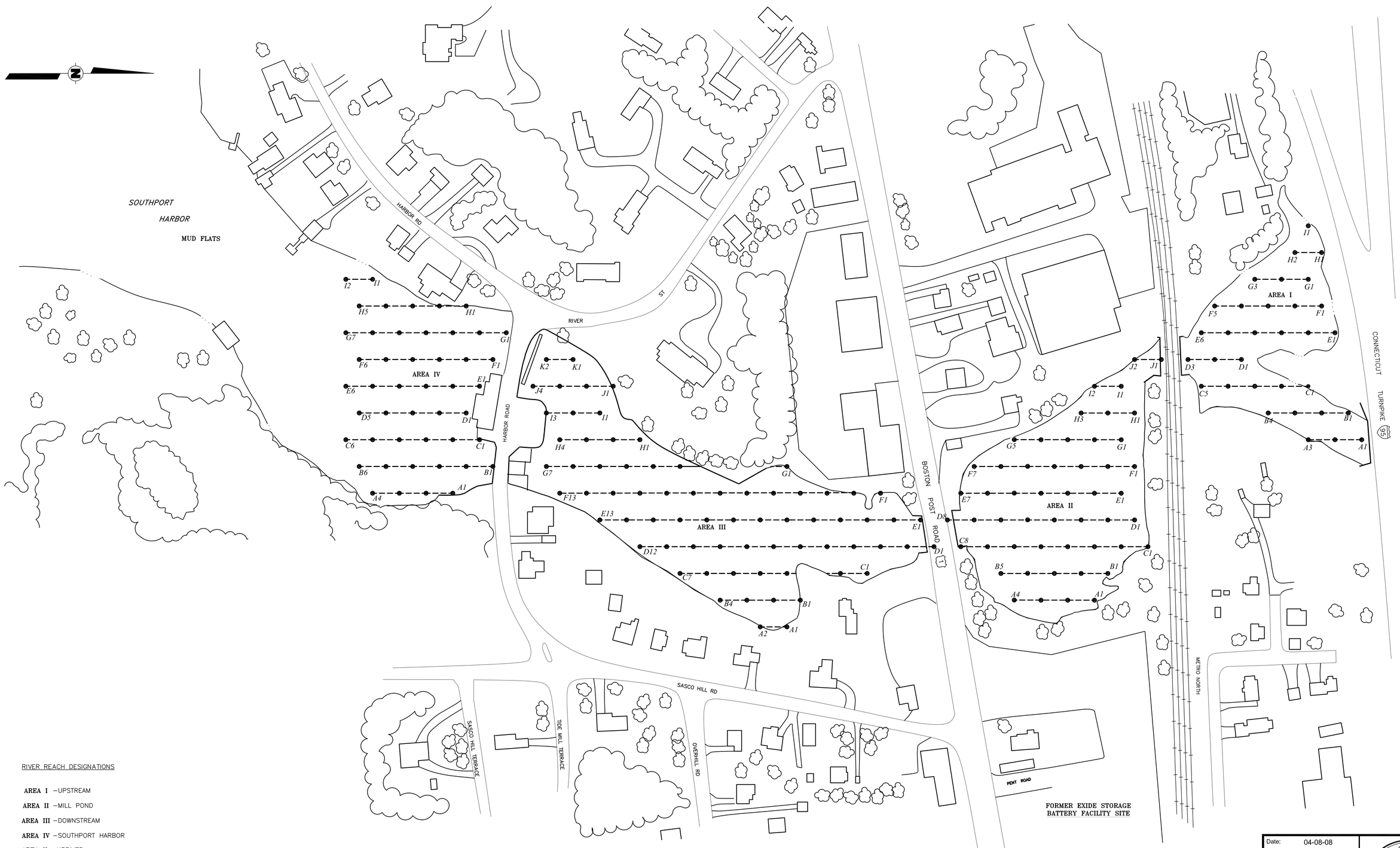

RIVER REACH DESIGNATIONS

AREA I –UPSTREAM

AREA II –MILL POND

AREA III –DOWNSTREAM

AREA IV –SOUTHPORT HARBOR

AREA V –UPRIVER

SOUTHPORT HARBOR MUD FLATS

SOURCES: TOWN PLAN AND ZONING COMMISSION, FAIRFIELD, CONNECTICUT, DATE: 4/12/68, SCALE: 1"= 100'

YWC, INC. FIGURE 4–5 MILL RIVER CHARACTERIZATION PROGRAM DATE: 2/92, SCALE: 1"= 80'

DRAWING 15
PROPOSED POST REMEDIATION CONFIRMATION SEDIMENT SAMPLE LOCATION PLAN
SOUTH OF I–95: AREAS I–IV
REMEDIAL ACTION PLAN
FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

Date	Revision
5-18-09	ADDED DRAWING NUMBER
9-15-08	ADDENDUM 1 SAMPLE LOC. ADDED

Date:	04-08-08
Scale:	1"=80'
Proj. No.:	8014-03
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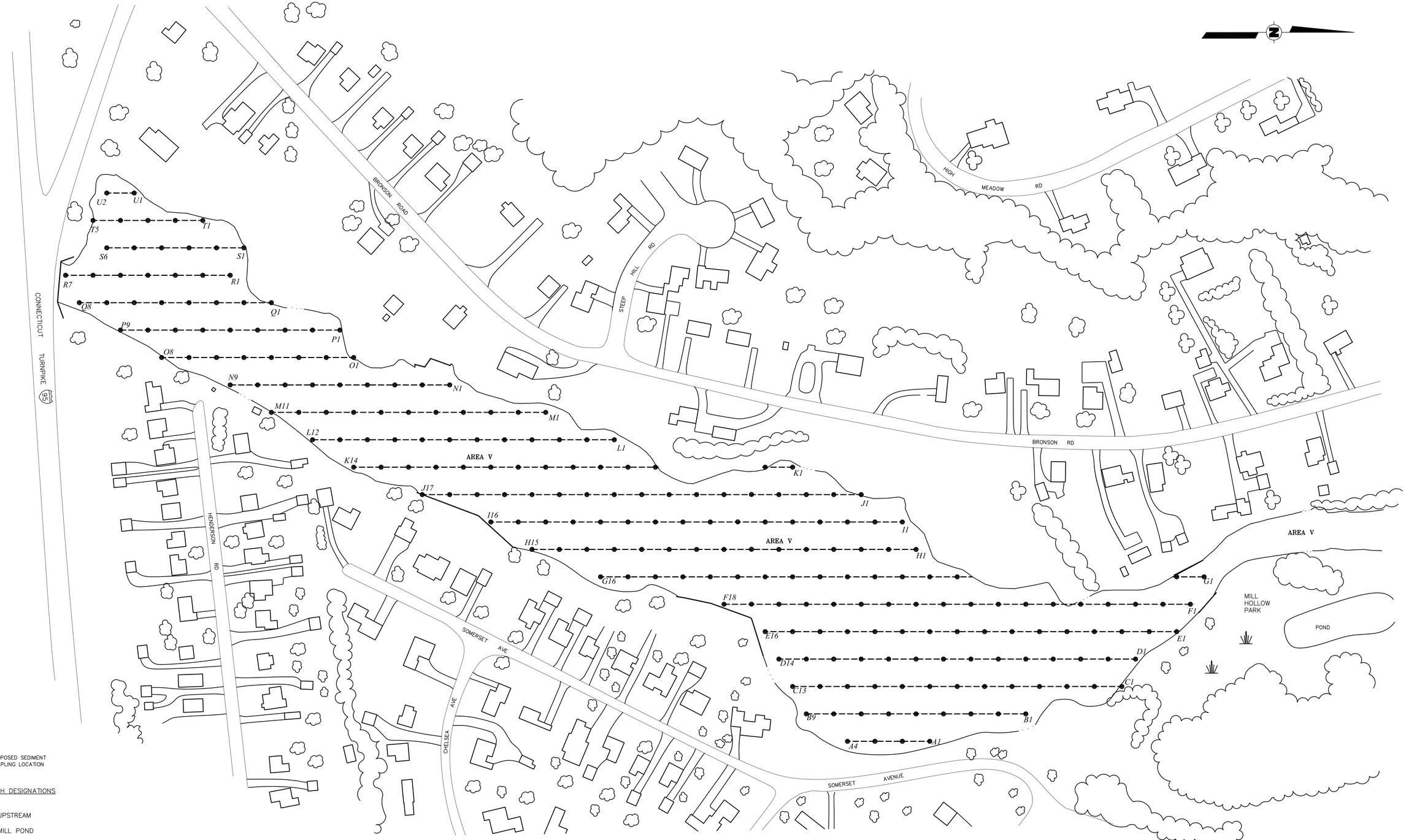

LEGEND

● PROPOSED SEDIMENT SAMPLING LOCATION

RIVER REACH DESIGNATIONS

AREA I –UPSTREAM

AREA II –MILL POND

AREA III –DOWNSTREAM

AREA IV –SOUTHPORT HARBOR

AREA V –UPRIVER

SOURCES: TOWN PLAN AND ZONING COMMISSION, FAIRFIELD, CONNECTICUT, DATE: 4/12/68, SCALE: 1"= 100'

YWC, INC. FIGURE 4–5 MILL RIVER CHARACTERIZATION PROGRAM DATE: 2/92, SCALE: 1"= 80'

DRAWING 16
PROPOSED POST REMEDIATION CONFIRMATION SEDIMENT SAMPLE LOCATION PLAN
NORTH OF I–95: AREA V
REMEDIAL ACTION PLAN
FOR LEAD IMPACTED SEDIMENTS
THE FORMER EXIDE BATTERY FACILITY PROJECT
2190 BOSTON POST ROAD, FAIRFIELD, CONNECTICUT

5-18-09	ADDED DRAWING NUMBER
Date	Revision

Date:	04-08-08
Scale:	1"=80'
Proj. No.:	8014-03
File No.:	2048
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