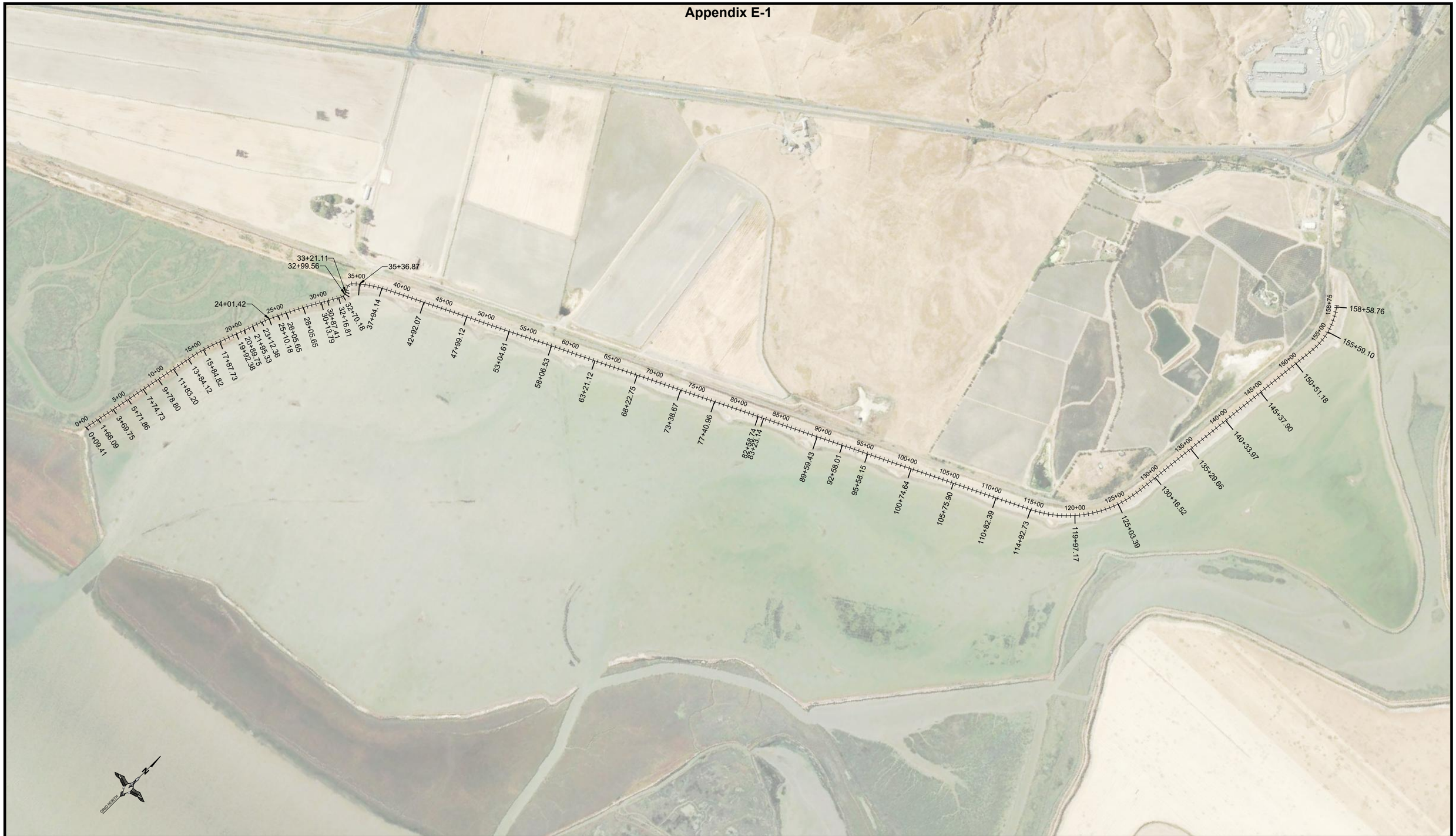
Appendix E. Levee Erosion Data

Appendix E

Levee Erosion Data

Contents

Appendix E-1



0 500 1000 FEET

HORIZONTAL SCALE

Unauthorized Changes & Uses

The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes must be in writing and must be approved by the preparer of these plans.

EXHIBIT

DUCKS UNLIMITED

PROJECT NO. US-CA-461-3 DATE: 5/19/2017		DESIGNED BY: AP
SEARS POINT WETLAND RESTORATION EROSION ANALYSIS		DRAWN BY: JS
		SURVEYED BY: JM
		CHECKED BY:
SITE MAP		SHEET NO. 1 of 4

K:\ACAD\CA\0461-003-BAF\SEXHIBITS\Levee Cross Section Exhibit 2017\EROSION SECTIONS EXHIBIT.dwg, SH01, 5/19/2017 3:09:41 PM

Appendix E-1

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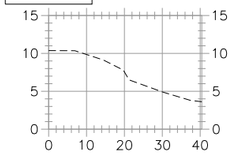

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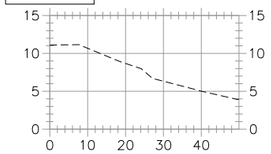

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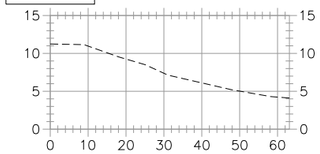

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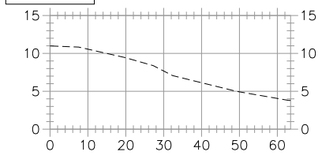

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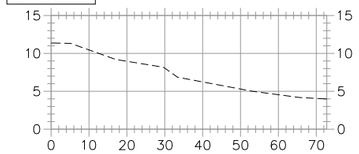

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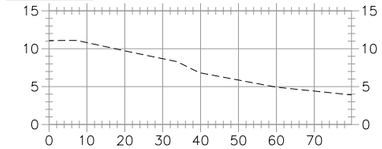

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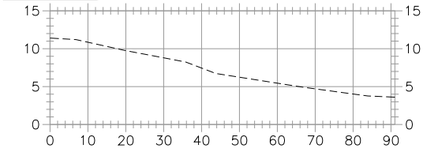

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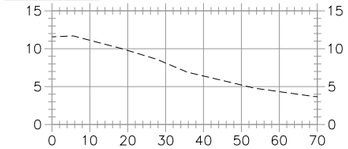

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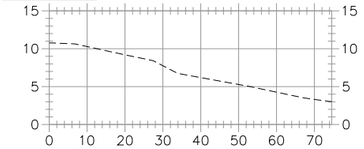

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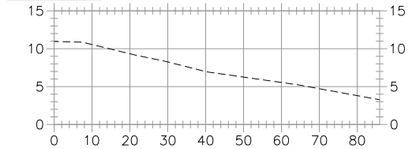

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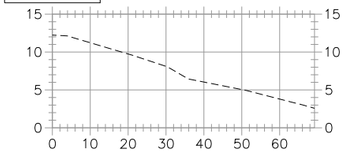

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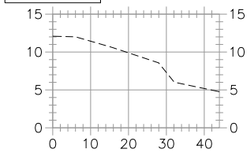

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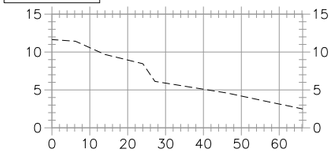

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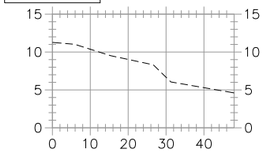

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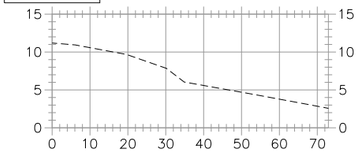

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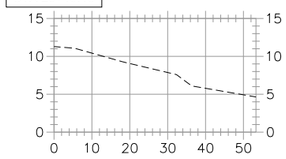

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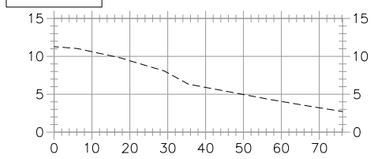

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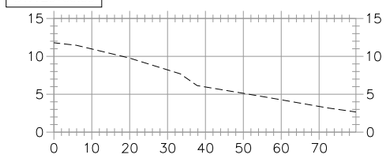

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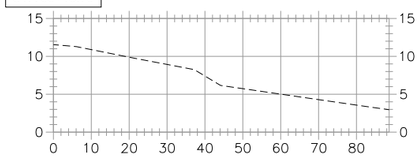

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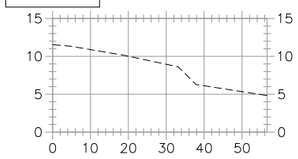

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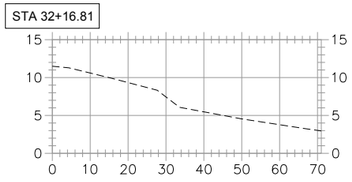

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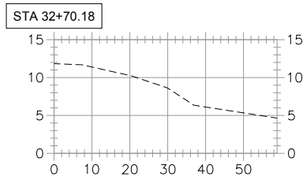

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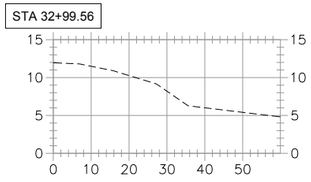

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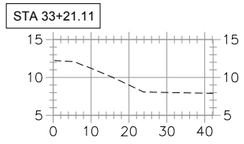

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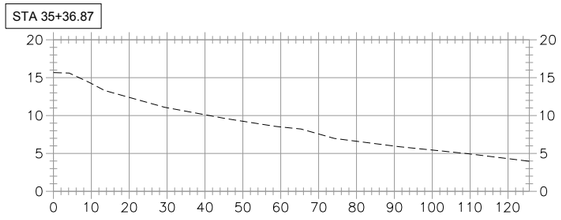

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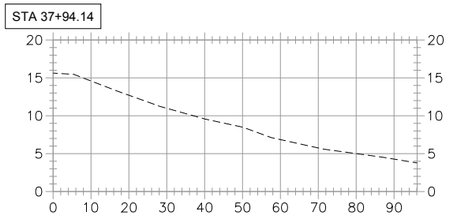

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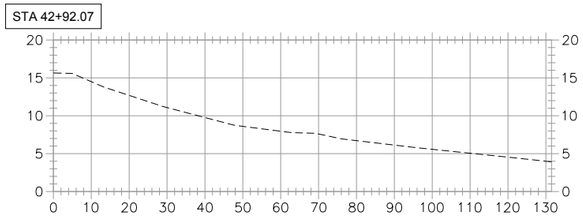

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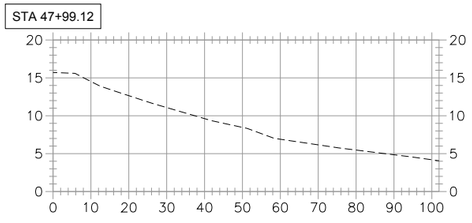

0 20 40 FEET

HORIZONTAL SCALE

0 10 20 FEET

VERTICAL SCALE

Unauthorized Changes & Uses

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EXHIBIT

DUCKS UNLIMITED

PROJECT NO. **US-CA-461-3** DATE: **5/19/2017**

SEARS POINT
WETLAND RESTORATION
EROSION ANALYSIS

SECTIONS

DESIGNED BY:	AP
DRAWN BY:	JS
SURVEYED BY:	JM
CHECKED BY:	
SHEET NO.	**2 of 4**

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Appendix E-1

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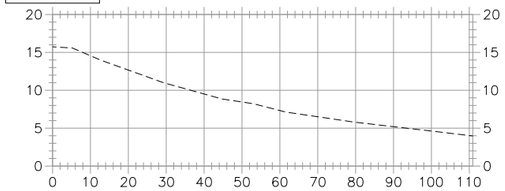

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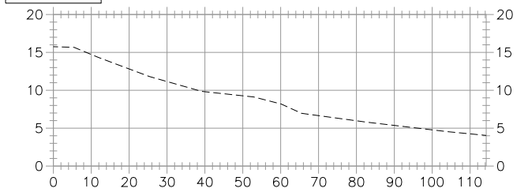

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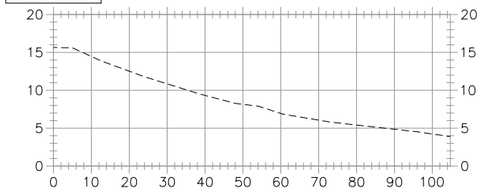

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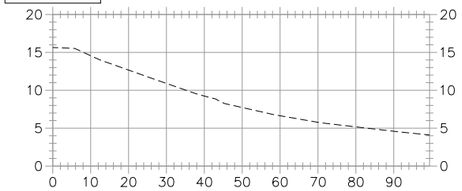

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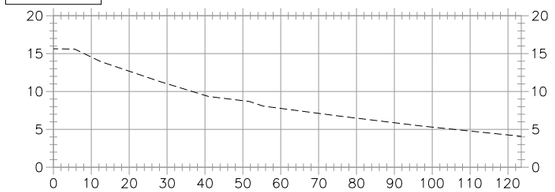

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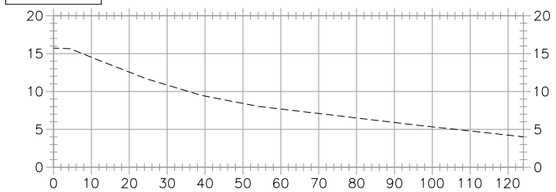

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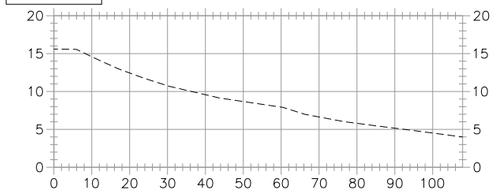

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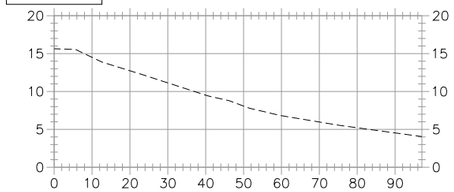

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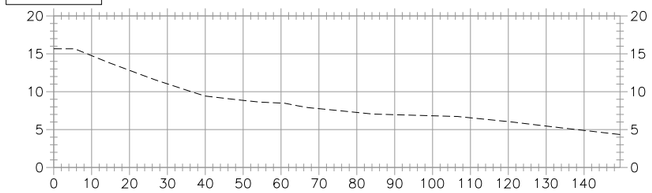

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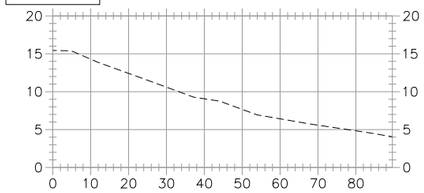

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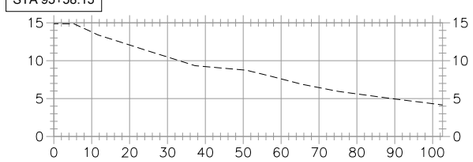

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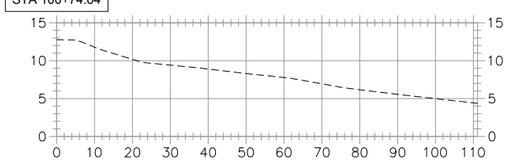

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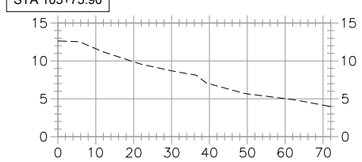

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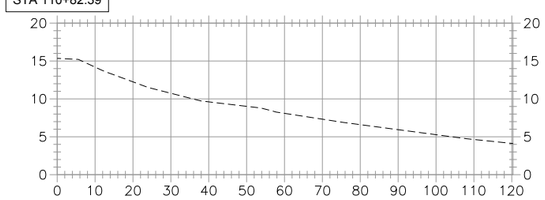

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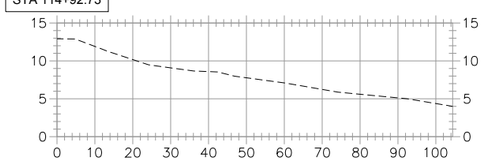

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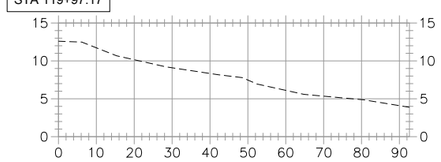

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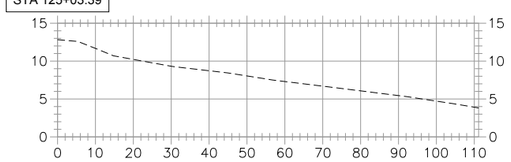

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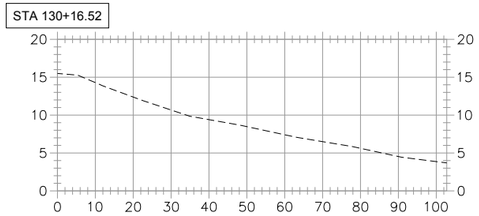

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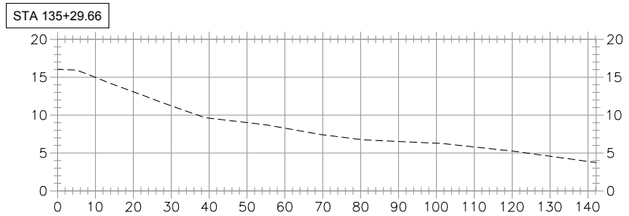

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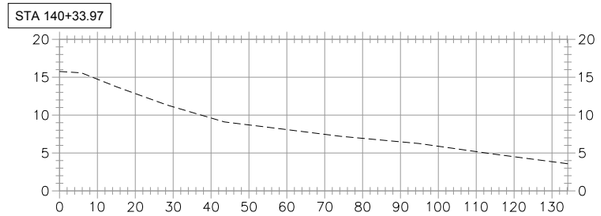

0 20 40 FEET

HORIZONTAL SCALE

0 10 20 FEET

VERTICAL SCALE

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EXHIBIT

DUCKS UNLIMITED

PROJECT NO. **US-CA-461-3** DATE: **5/19/2017**

SEARS POINT
WETLAND RESTORATION
EROSION ANALYSIS

SECTIONS

DESIGNED BY:	AP
DRAWN BY:	JS
SURVEYED BY:	JM
CHECKED BY:	
SHEET NO.	**3 of 4**

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Appendix E-1

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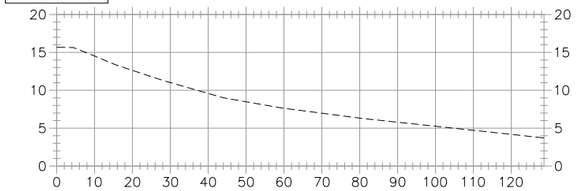

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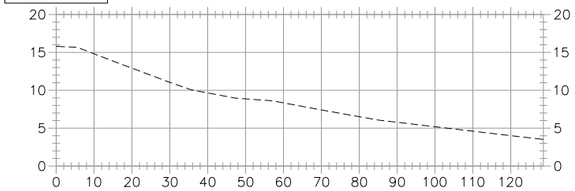

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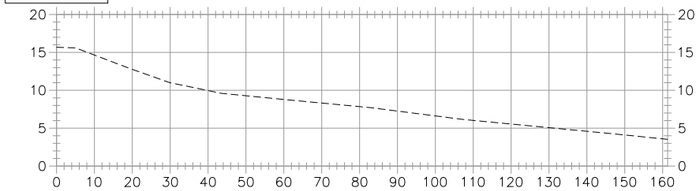

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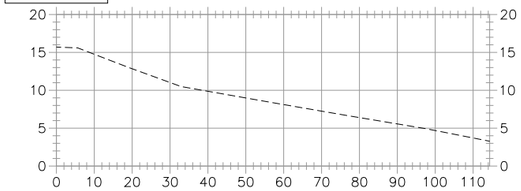

0 20 40 FEET

HORIZONTAL SCALE

0 10 20 FEET

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DUCKS UNLIMITED

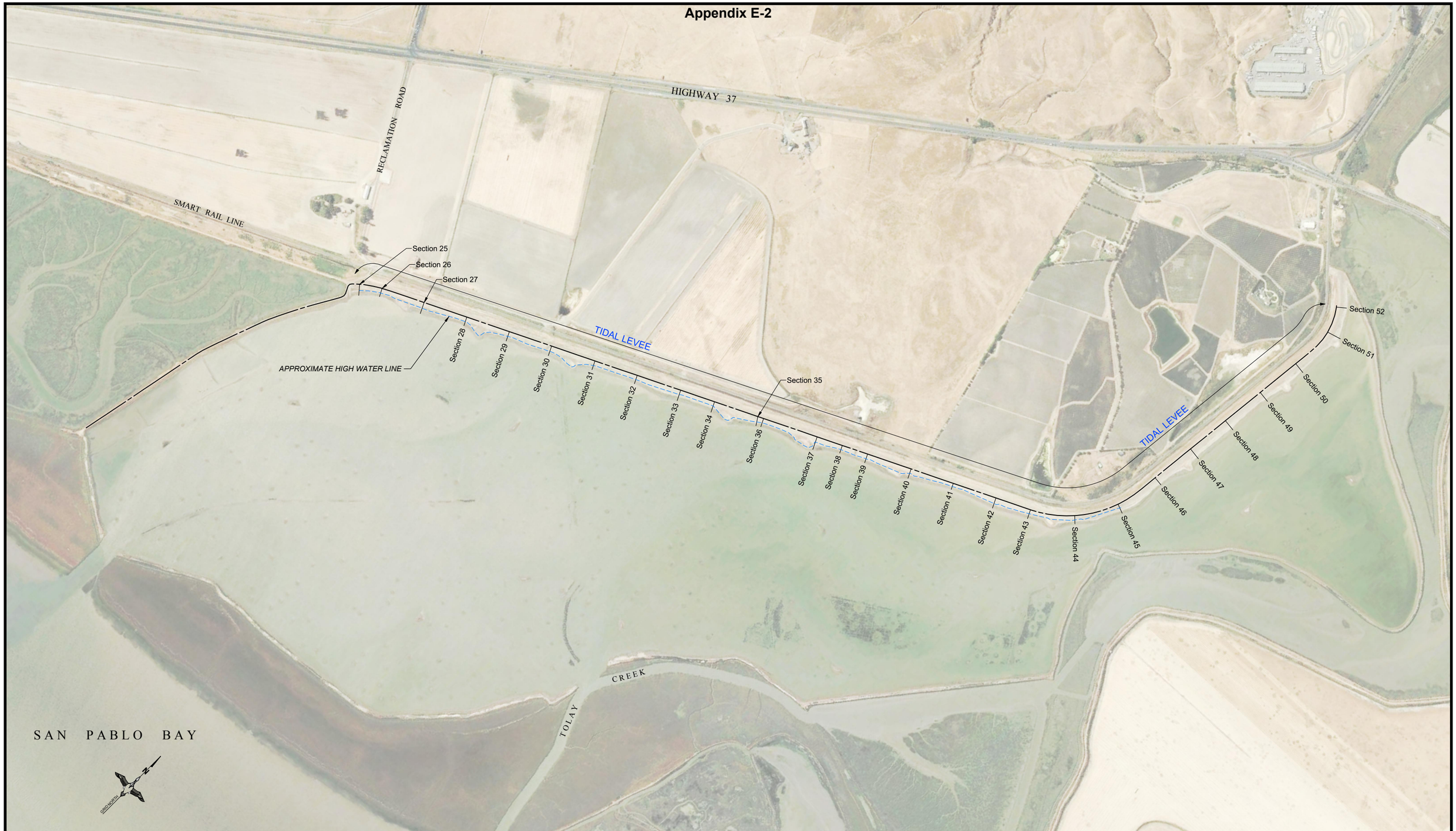
PROJECT NO. US-CA-461-3 DATE: 5/19/2017

SEARS POINT
WETLAND RESTORATION
EROSION ANALYSIS

SECTIONS

DESIGNED BY:	AP
DRAWN BY:	JS
SURVEYED BY:	JM
CHECKED BY:	
SHEET NO.	**4 of 4**

Appendix E-2



0 500 1000 FEET
HORIZONTAL SCALE

Unauthorized Changes & Uses
The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes must be in writing and must be approved by the preparer of these plans.

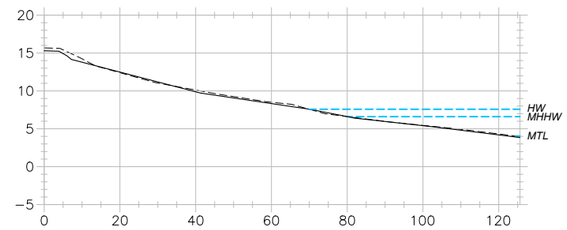
EXHIBIT

DUCKS UNLIMITED

PROJECT NO. US-CA-461-3 DATE: 11/27/2018		DESIGNED BY: AP
SEARS POINT WETLAND RESTORATION EROSION ANALYSIS		DRAWN BY: JS
		SURVEYED BY: JM
		CHECKED BY:
SITE MAP		SHEET NO. 1 of 3

TIDAL LEVEE

SECTION 25



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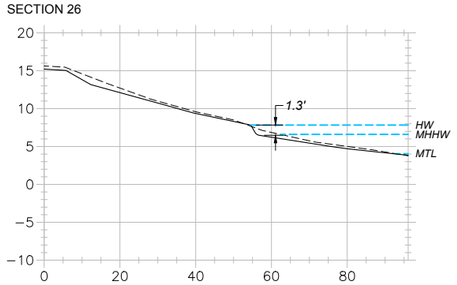

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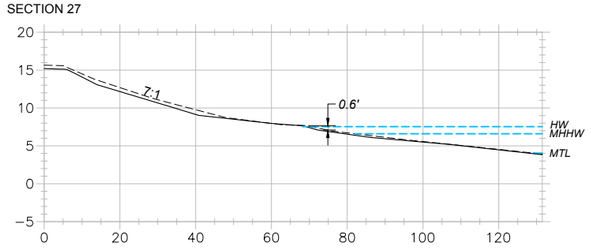

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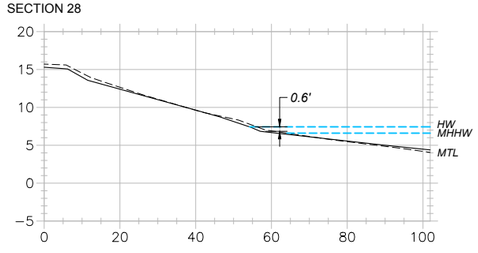

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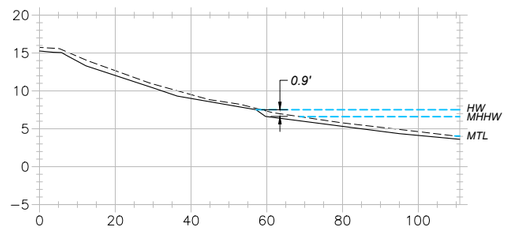

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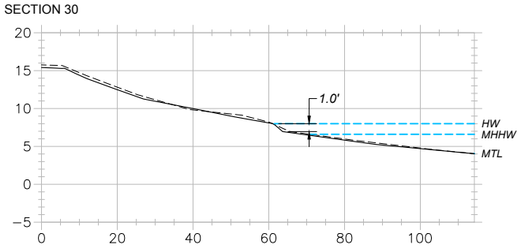

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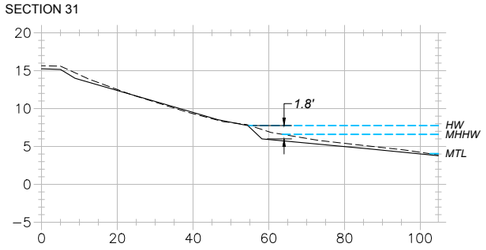

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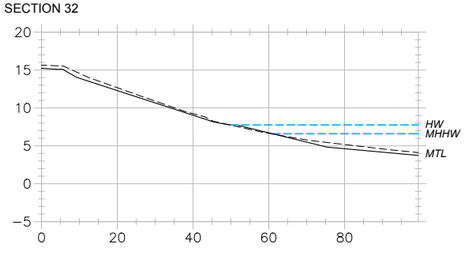

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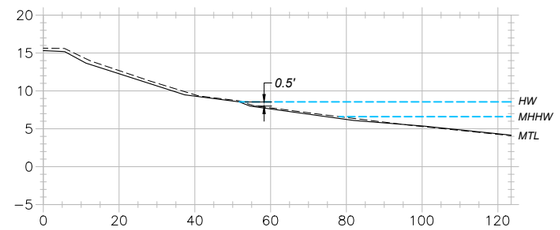

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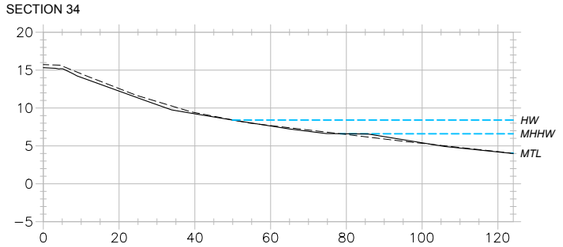

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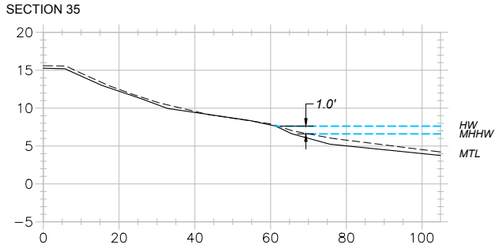

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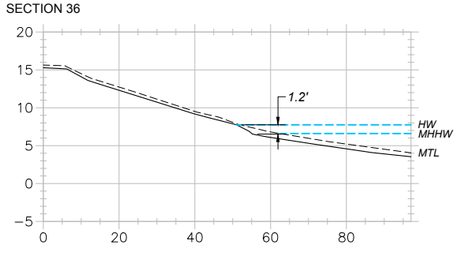

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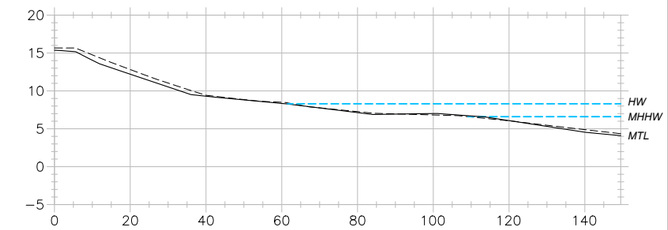

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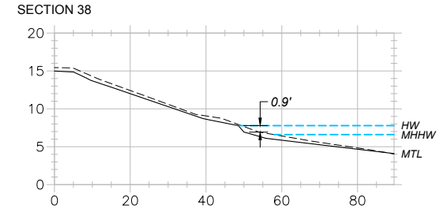

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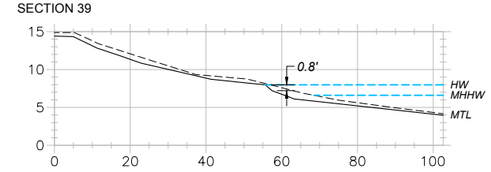

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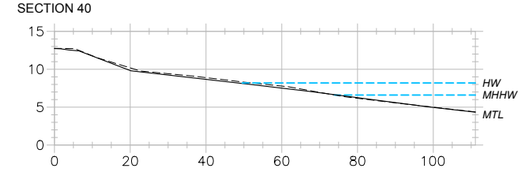

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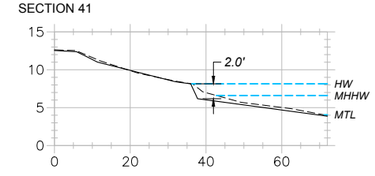

0 20 40 FEET
HORIZONTAL SCALE
0 10 20 FEET
VERTICAL SCALE

Unauthorized Changes & Uses

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LEGEND

NOTE: ALL ELEVATIONS ARE IN FEET, NAVD88.

Inspection survey (October, 2018)	
Post breach survey (May 2017, 18 months after the site was breached)	
Water Surface	
1.5' Approximate height of scarp as dimensioned from the plans	
HW	High Water Mark (Elevation Varies), surveyed from debris line 10/30/2018
MHHW	Mean Higher High Water (6.60ft) for B1-1, as modeled by Moffat and Nichol in their June 30, 2008 Addendum to the Hydrodynamic Modeling Analysis.
MTL	Mean Tide Level (4.05ft) for point B1-1, as calculated by Moffat and Nichol in their June 30, 2008 Addendum to the Hydrodynamic Modeling Analysis.

EXHIBIT

DUCKS UNLIMITED

PROJECT NO. US-CA-461-3 DATE: 11/27/2018

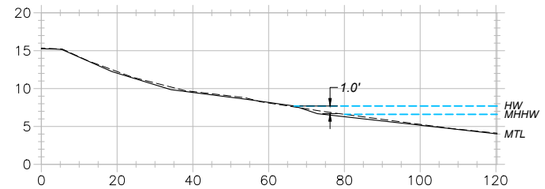
SEARS POINT WETLAND RESTORATION EROSION ANALYSIS

TIDAL LEVEE SECTIONS

DESIGNED BY: AP
DRAWN BY: JS
SURVEYED BY: JM
CHECKED BY:
SHEET NO. **2 of 3**

TIDAL LEVEE

SECTION 42



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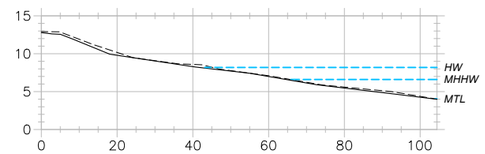

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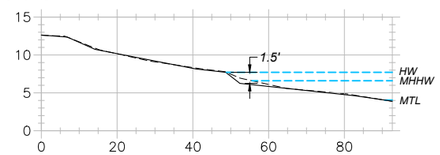

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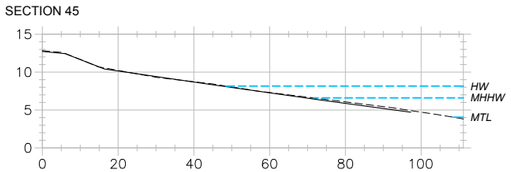

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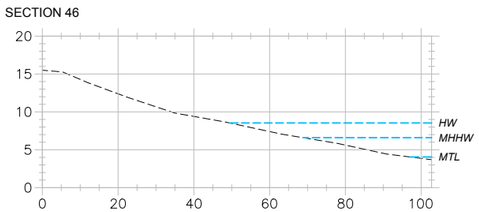

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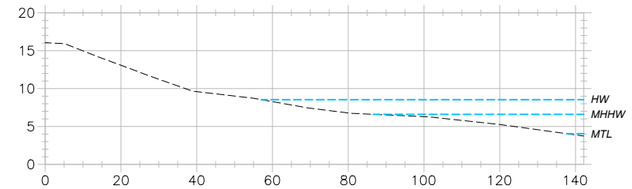

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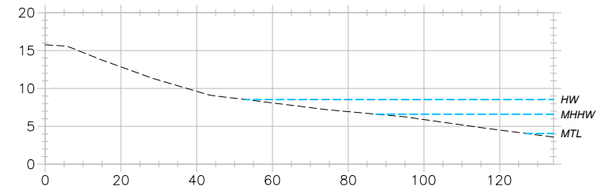

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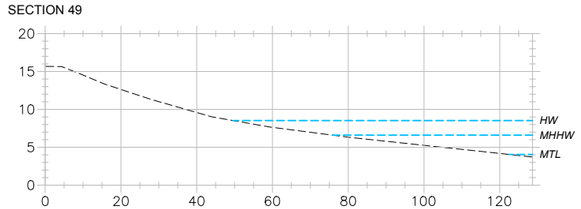

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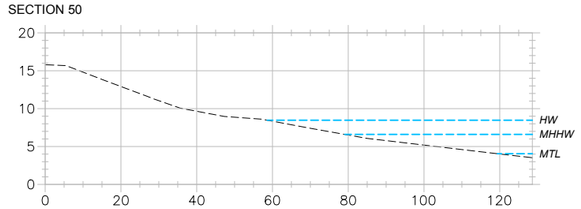

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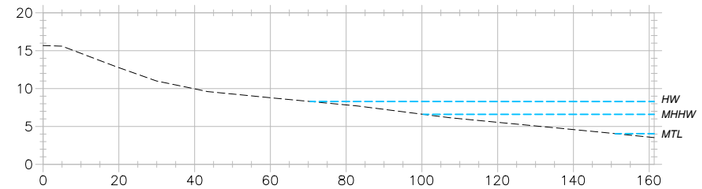

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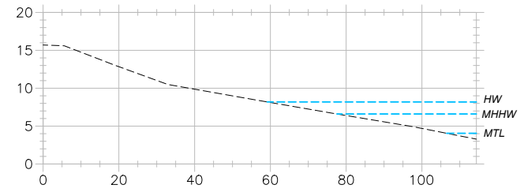

0 20 40 FEET
HORIZONTAL SCALE
0 10 20 FEET
VERTICAL SCALE

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EXHIBIT

DUCKS UNLIMITED

PROJECT NO. US-CA-461-3 DATE: 11/27/2018

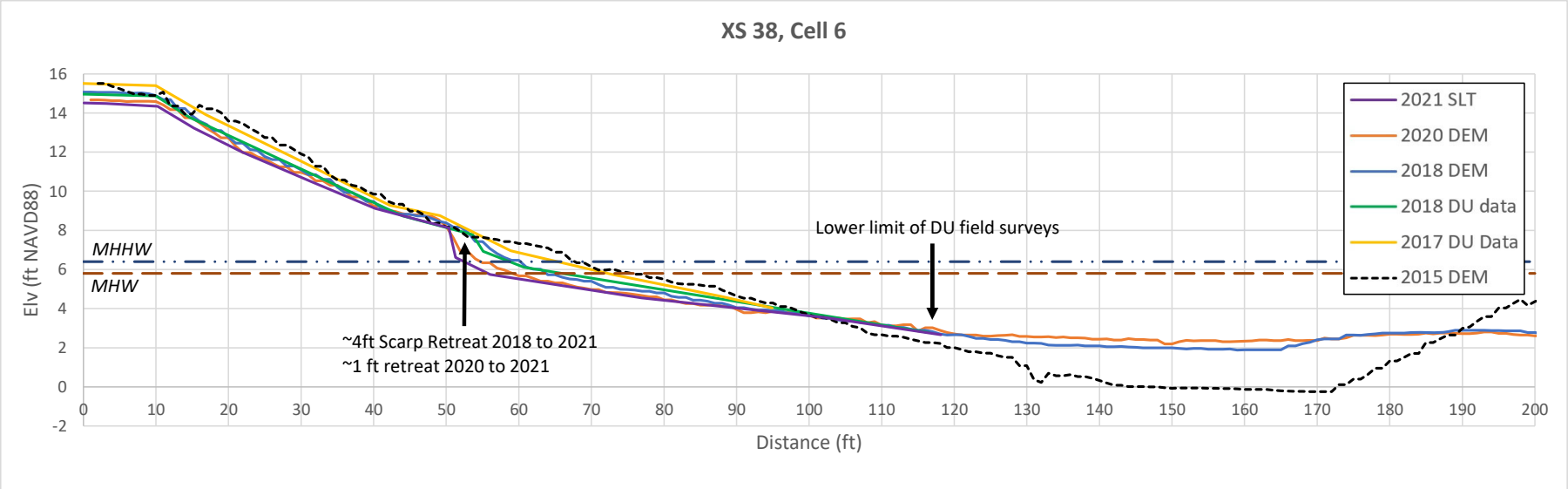
SEARS POINT
WETLAND RESTORATION
EROSION ANALYSIS

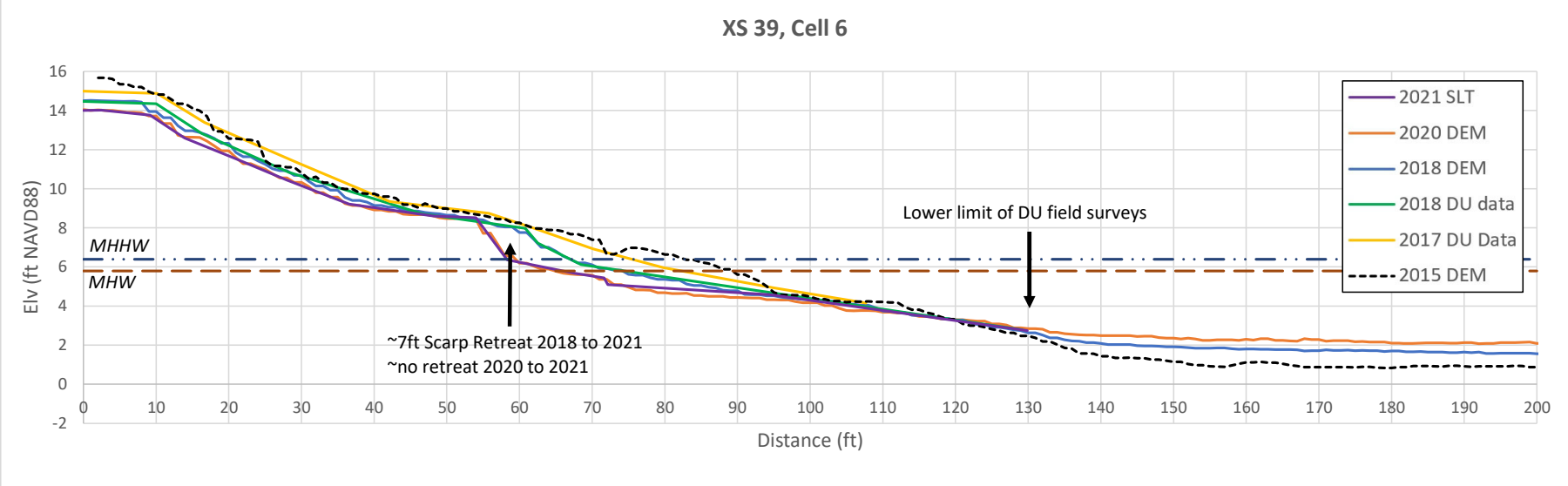
TIDAL LEVEE SECTIONS

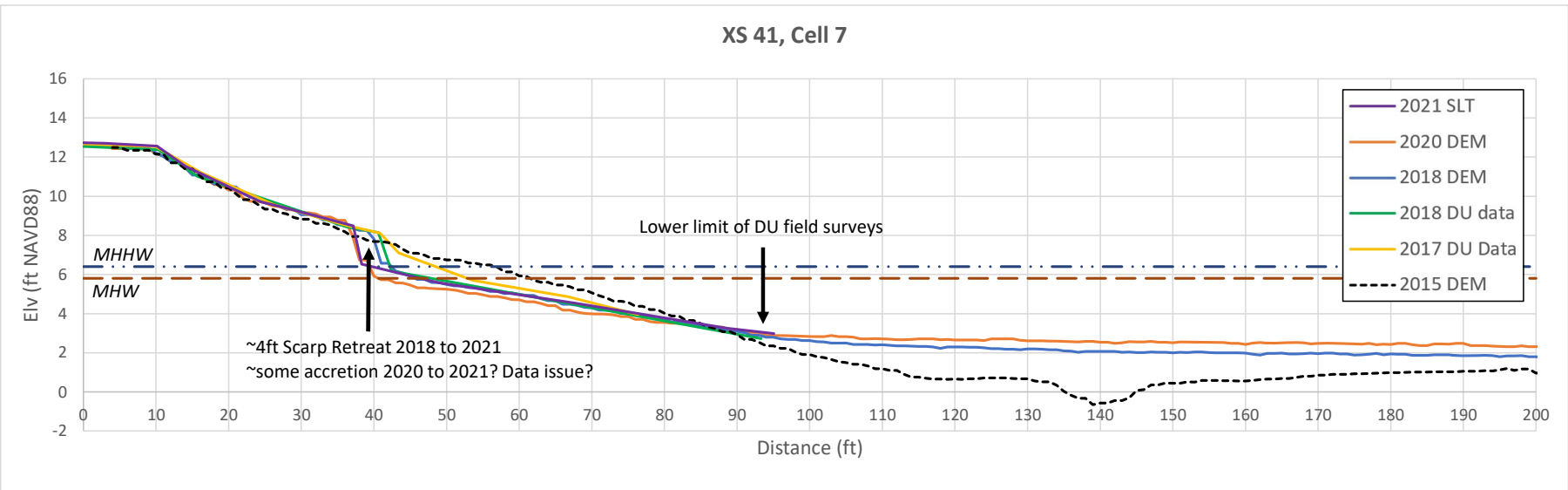
DESIGNED BY: AP
DRAWN BY: JS
SURVEYED BY: JM
CHECKED BY:
SHEET NO. 3 of 3

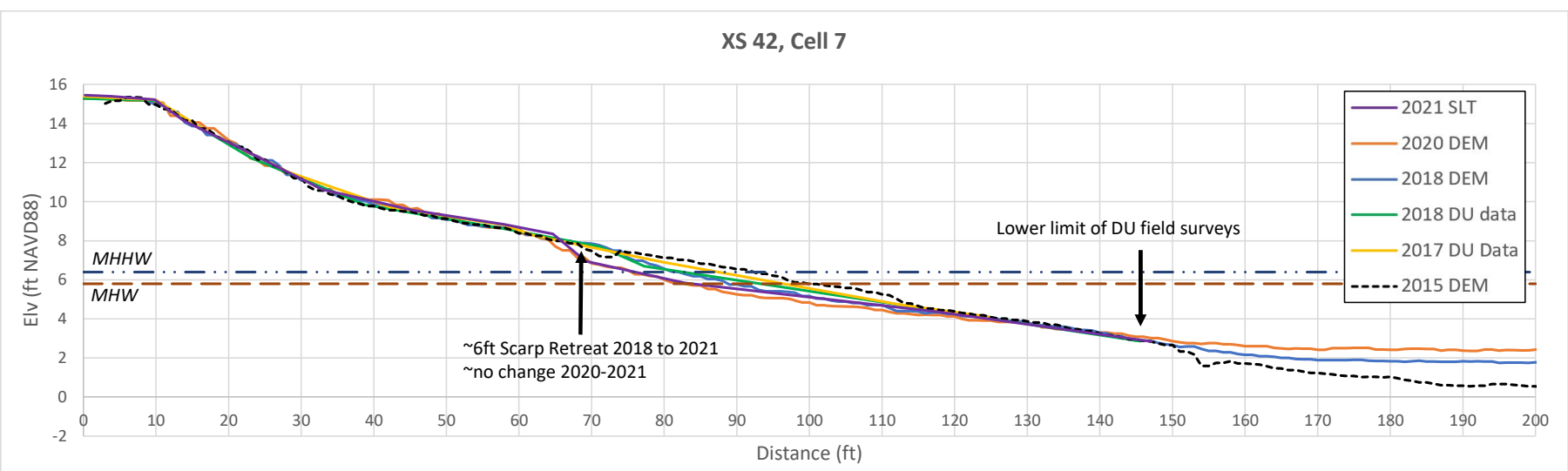
Appendix E-3

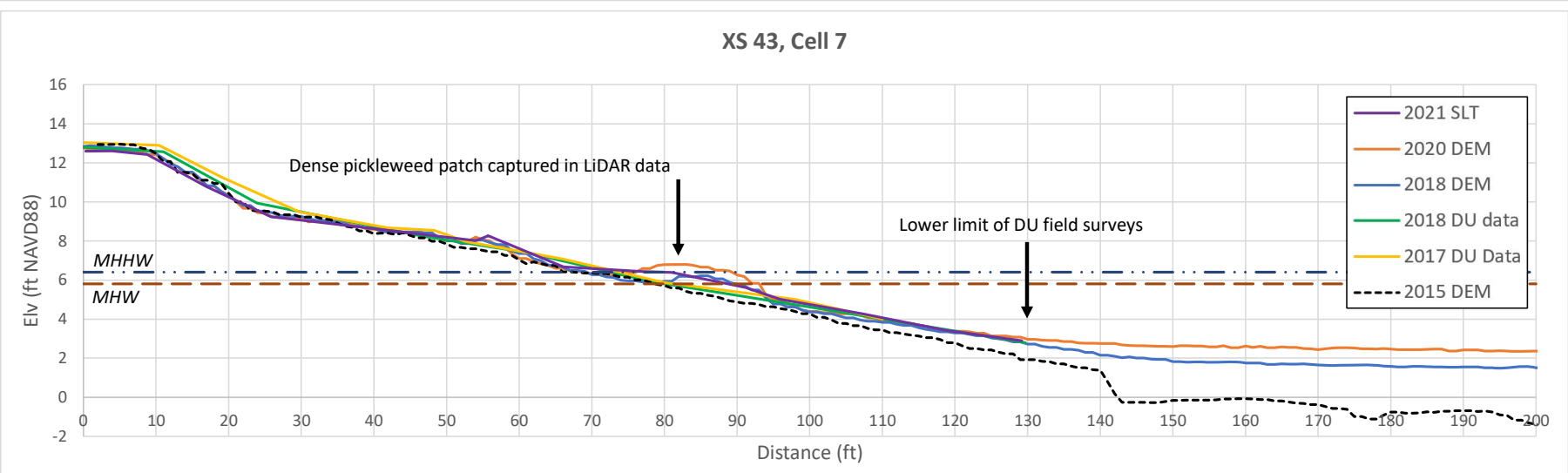
Topographic Transects in Cells 6 and 7: 2015 As-built, 2017 and 2018 DU field data, 2018 and 2020 LiDAR DEM, 2021 SLT field data

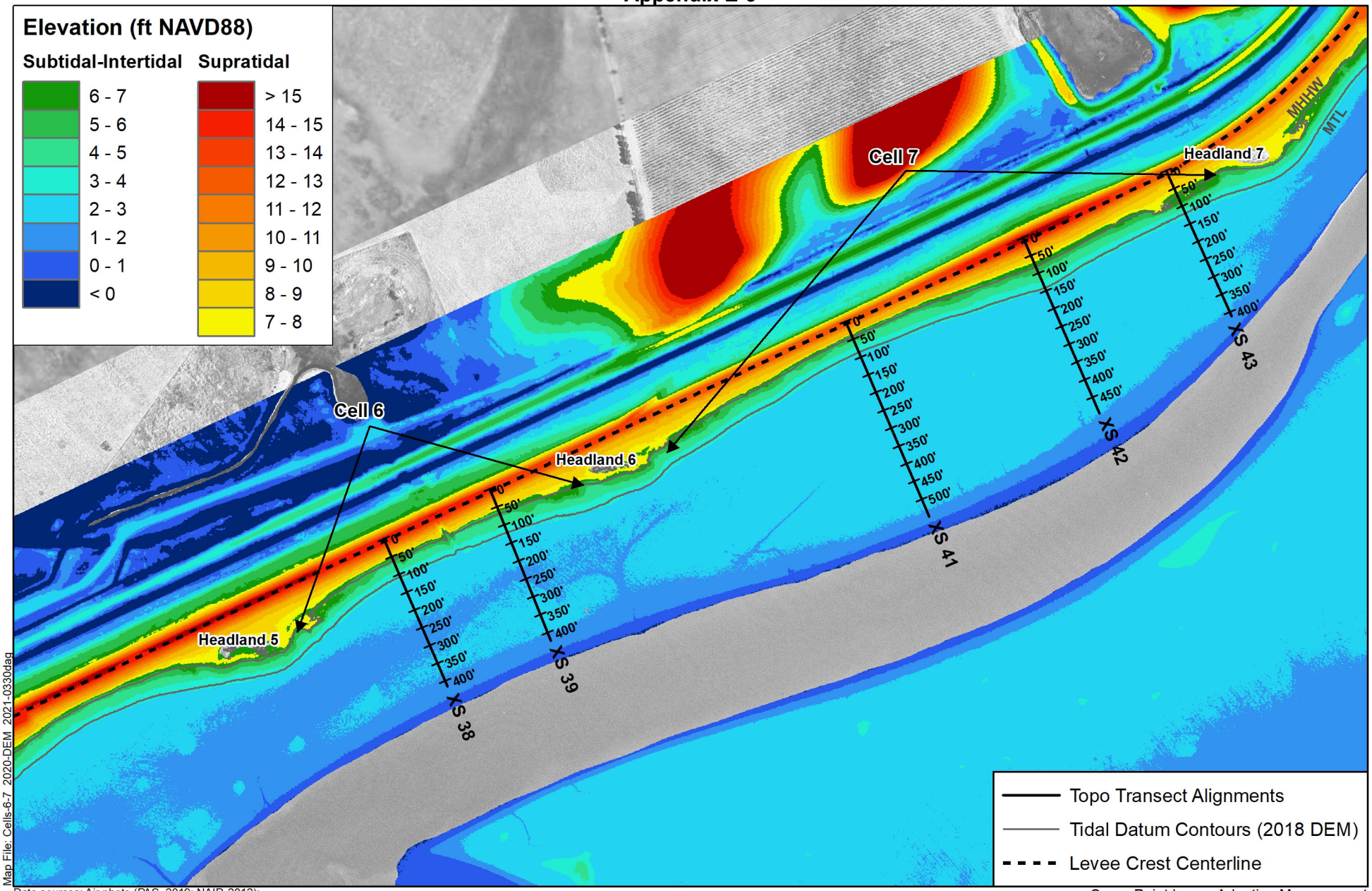












Map File: Cells-6-7_2020-DEM_2021-0330dag

Data sources: Air photo (PAS, 2019; NAIP, 2012);
Elevation (QS, 2020)

1:4,200 (1" = 350' at letter size)
0 175 350 Ft
0 50 100 M

Sears Point Levee Adaptive Management

SIEGEL ENVIRONMENTAL

Figure xx

Cell 6-7 Intertidal Basin Elevation: 2020

Appendix E-4

Map Legend

Design Treatments

Treatment Approach	Scarp Grading	LWD Placement	Mud Placement	Brush Fence	Veneer (lower)
No Color Approach A		NO TREATMENT			
Approach B	■				
Approach C		■			
Approach D			■		
Approach E	■	■			
Approach F		■	■		
Approach G	■	■	■		
Approach H	■	■	■	■	■
Approach I	■		■		

Field Added Treatments

- Mud Placement (above MHHW)
- Gravel Toe Berm (above MHHW)
- Gravel Veneer (above MHHW)
- Topographic Sections

Topographic Section Plot Legend

- Pre-Construction Topography
- Post-Construction Topography

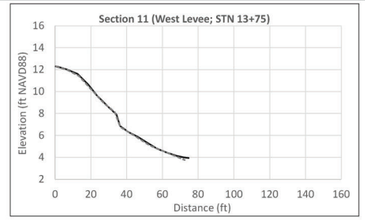
Notes

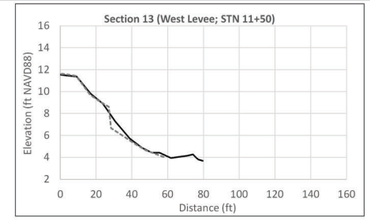
1. Post-construction (as-built) topography surveyed by Dixon Marine Services between November 5 and 26, 2021 using RTK GPS.

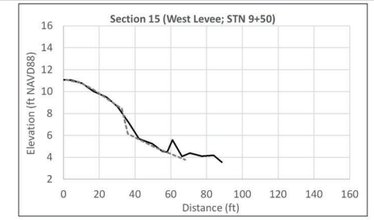
2. Pre-construction topography is from the following sources:
   - Sections 11 - 47: May 6, 2021 topographic survey performed by Daniel Harris of SFSU using RTK GPS.
   - Sections 101 - 121: June 2020 LiDAR digital elevation model (DEM) of Sears Pt Restoration Project site by Quantum Spatial.

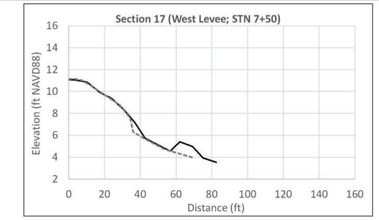
3. Topographic survey data are held to the benchmark network shown on Sheet 2

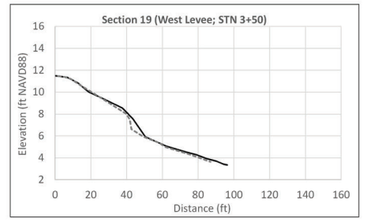
4. Considerations for 2020 LiDAR data:
   - Data gaps along sections are due to the presense of standing water at the time of LiDAR acquisition.
   - Vegetation interference may be present in some locations, resulting in artificially high elevations.

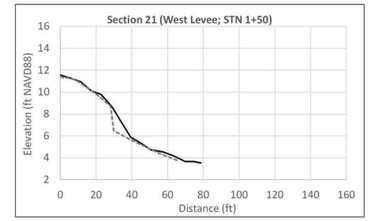


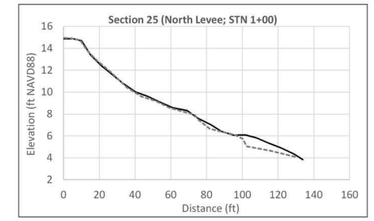


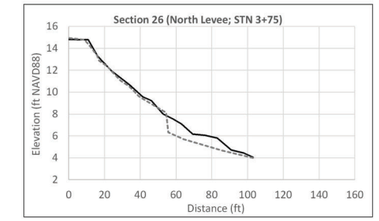


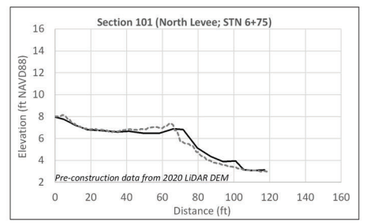


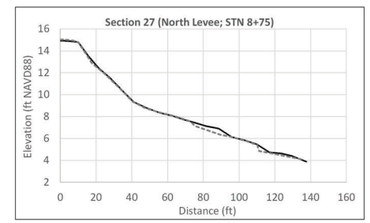


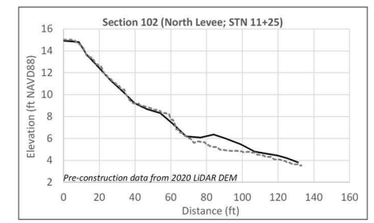


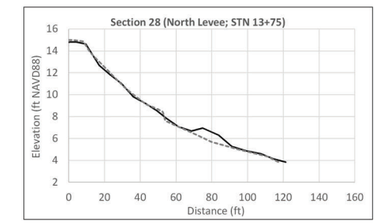


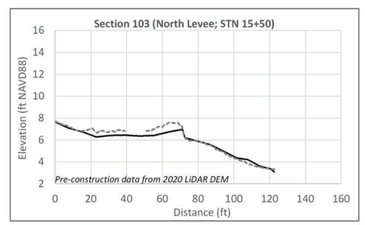


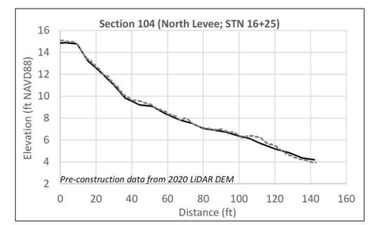


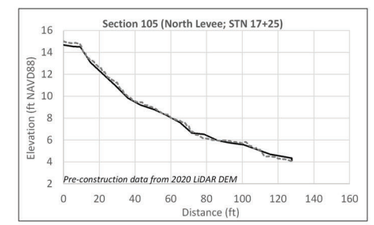


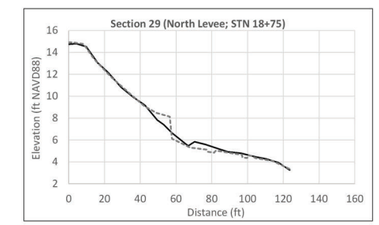


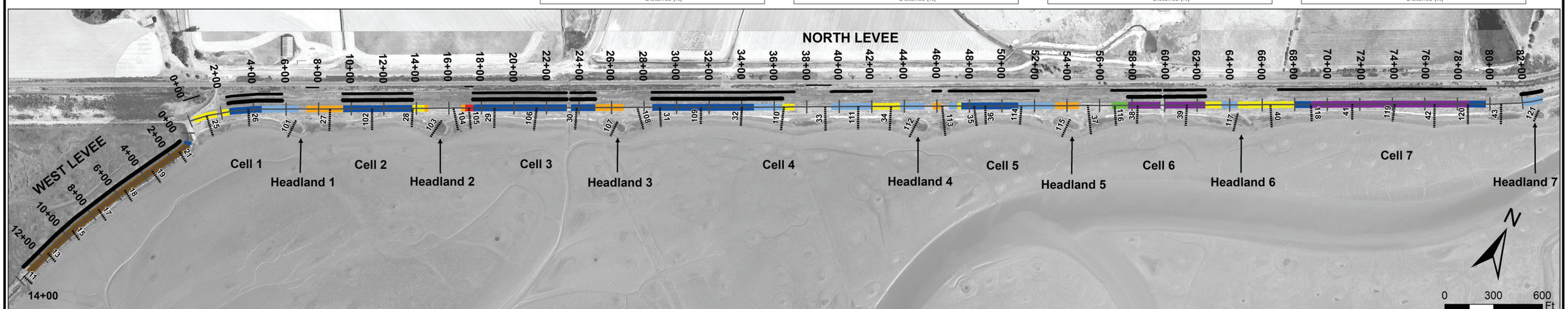












NUMBER	DATE	DESCRIPTION	BY

REVISION BLOCK

DRAWN BY: DAG
DESIGNED BY: PRB, RDL, SWS, DAG
CHECKED BY: RDL
SCALE: 1:3,600

Levee Erosion Adaptive Management Project

Sears Point Tidal Marsh Restoration Project
Sonoma County, CA

Submitted: _____
Principal Civil Engineer
APPROVED BY:
PERMITTEE DATE

SONOMA LAND TRUST
SIEGEL ENVIRONMENTAL
Gillenwater GillenH2O Consulting
FarWest RESTORATION ENGINEERING
Peter Baye, Ph.D.

AS-BUILT TOPOGRAPHIC SECTIONS (1)

DATE: 1/25/2022
SHEET: 9
PROJECT NO. 3021

File name: As-built-XS-Sheet1_DL_Sears-Pt_2022-0126dag

Appendix E-4

Map Legend

Design Treatments

Treatment Approach	Scarp Grading	LWD Placement	Mud Placement	Brush Fence	Veneer (lower)
No Color Approach A		NO TREATMENT			
Approach B	■				
Approach C		■			
Approach D			■		
Approach E	■	■			
Approach F		■	■		
Approach G	■	■	■		
Approach H	■	■	■	■	■
Approach I	■		■		

Field Added Treatments

- Mud Placement (above MHHW)
- Gravel Toe Berm (above MHHW)
- Gravel Veneer (above MHHW)
- Topographic Sections

Topographic Section Plot Legend

- Pre-Construction Topography
- Post-Construction Topography

Notes

1. Post-construction (as-built) topography surveyed by Dixon Marine Services between November 5 and 26, 2021 using RTK GPS.

2. Pre-construction topography is from the following sources:
   - Sections 11 - 47: May 6, 2021 topographic survey performed by Daniel Harris of SFSU using RTK GPS.
   - Sections 101 - 121: June 2020 LiDAR digital elevation model (DEM) of Sears Pt Restoration Project site by Quantum Spatial.

3. Topographic survey data are held to the benchmark network shown on Sheet 2

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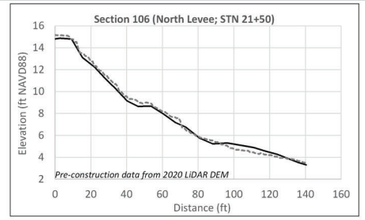
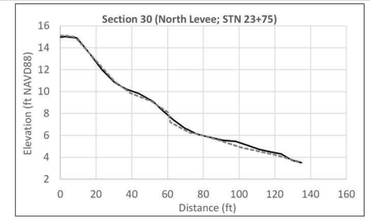
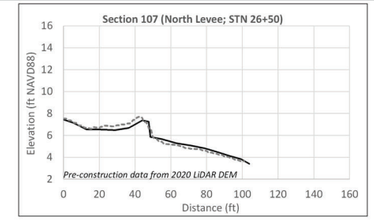
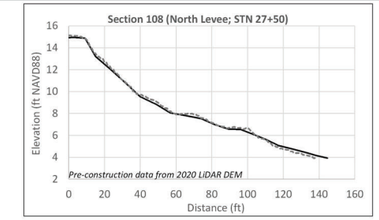
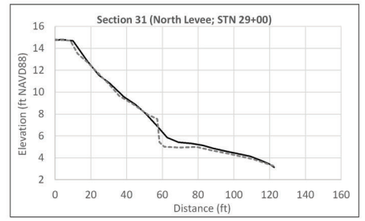
   - Vegetation interference may be present in some locations, resulting in artificially high elevations.

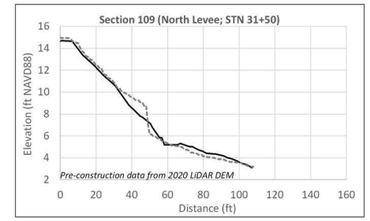


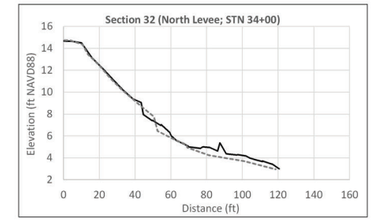


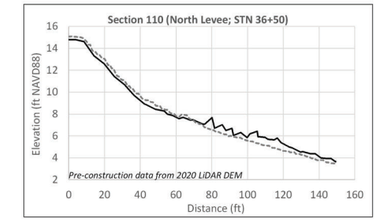


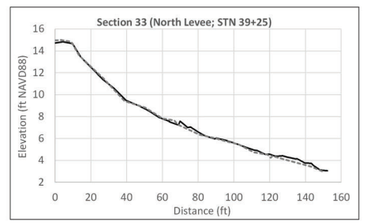


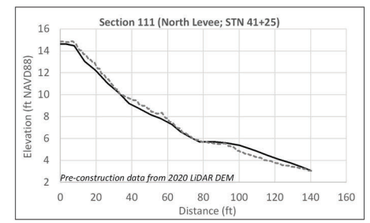


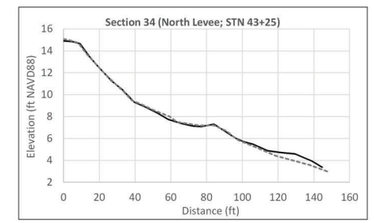


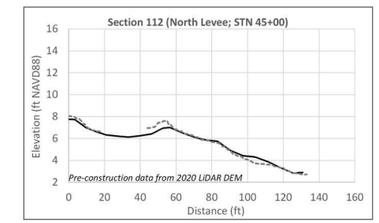


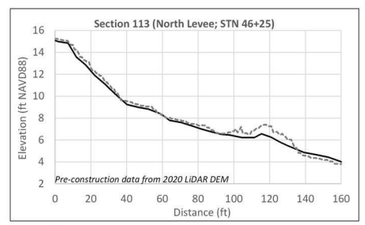


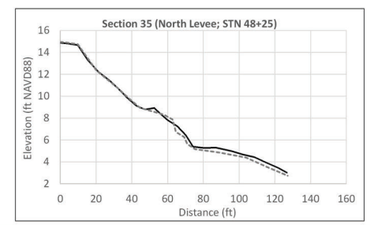


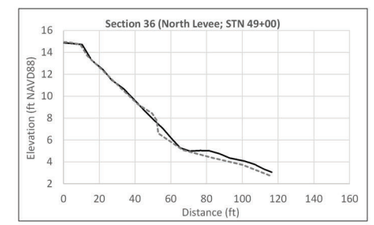


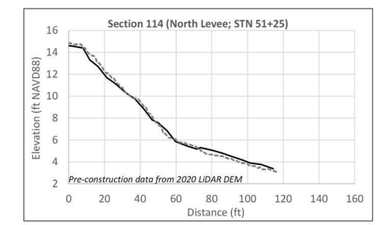


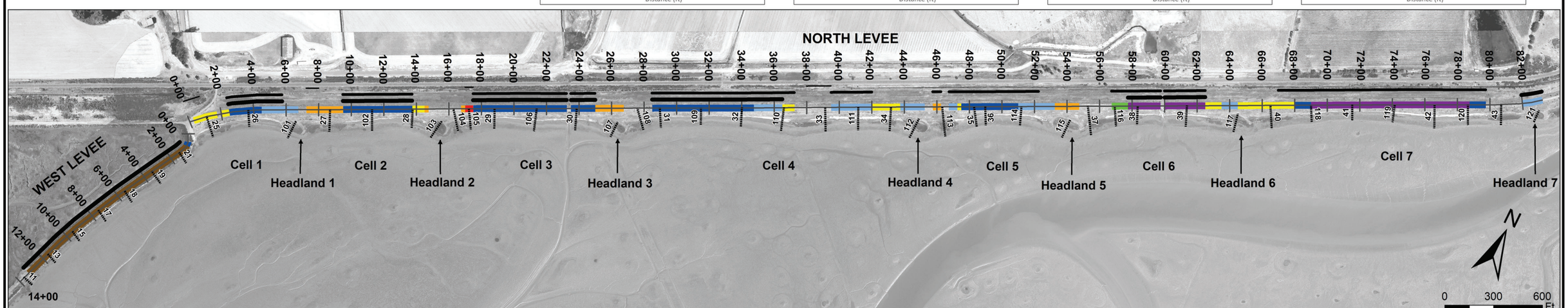












NUMBER	DATE	DESCRIPTION	BY

REVISION BLOCK

DRAWN BY: DAG
DESIGNED BY: PRB, RDL, SWS, DAG
CHECKED BY: RDL
SCALE: 1:3,600

Levee Erosion Adaptive Management Project

Sears Point Tidal Marsh Restoration Project
Sonoma County, CA

Submitted: _____
Principal Civil Engineer
APPROVED BY:
PERMITTEE DATE

SONOMA LAND TRUST
SIEGEL ENVIRONMENTAL
Gillenwater GillenH2O Consulting
FarWest RESTORATION ENGINEERING
Peter Baye, Ph.D.

AS-BUILT TOPOGRAPHIC SECTIONS (2)

DATE: 1/26/2022
SHEET: 10
PROJECT NO. 3021

File name: As-built-XS-Sheet2_DL_Sears-Pt_2022-0126dag

Appendix E-4

Map Legend

Design Treatments

Treatment Approach	Scarp Grading	LWD Placement	Mud Placement	Brush Fence	Veneer (lower)
No Color Approach A			NO TREATMENT		
Approach B	■				
Approach C		■			
Approach D			■		
Approach E	■	■			
Approach F		■	■		
Approach G	■	■	■		
Approach H	■	■	■	■	■
Approach I	■		■		

Field Added Treatments

- Mud Placement (above MHHW)
- Gravel Toe Berm (above MHHW)
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- Topographic Sections

Topographic Section Plot Legend

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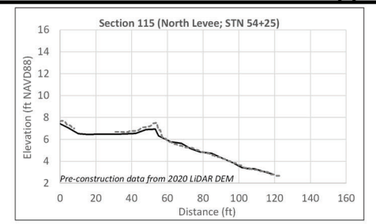

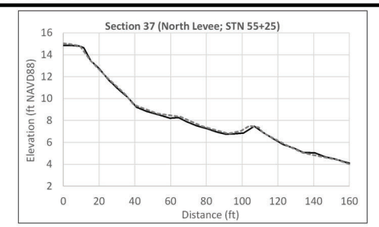

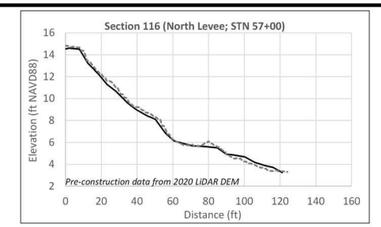

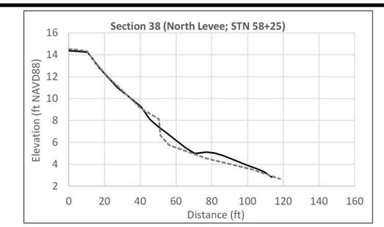

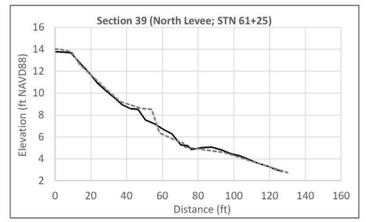

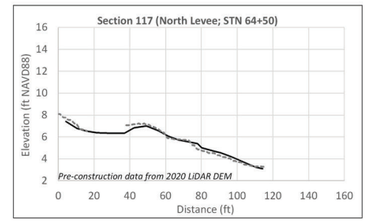

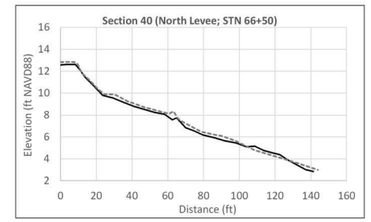

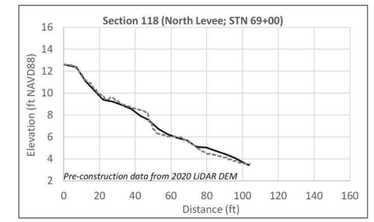

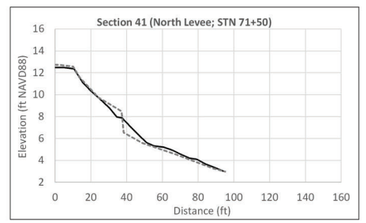

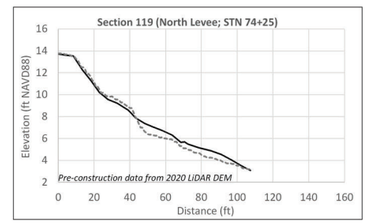

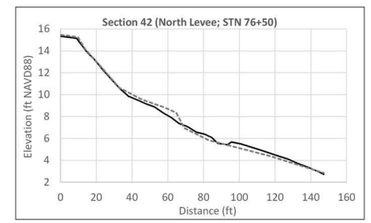

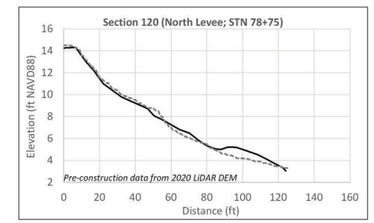

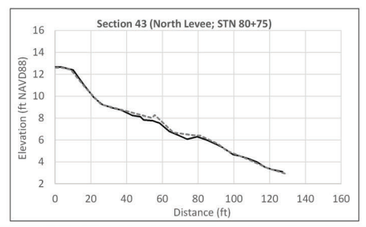

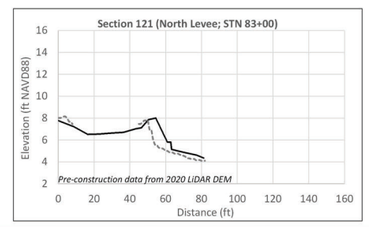

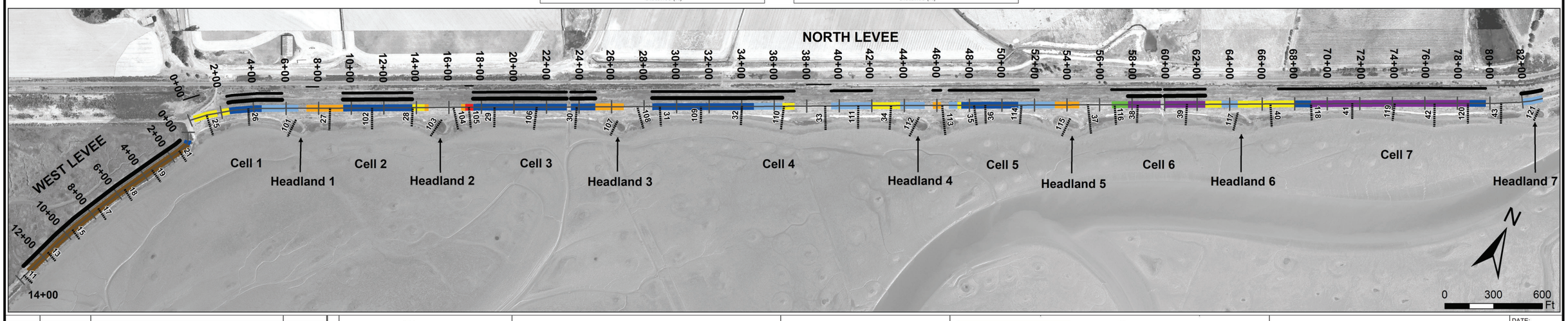

NUMBER	DATE	DESCRIPTION	BY

REVISION BLOCK

DRAWN BY: DAG
DESIGNED BY: PRB, RDL, SWS, DAG
CHECKED BY: RDL
SCALE: 1:3,600

Levee Erosion Adaptive Management Project

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Peter Baye, Ph.D.

AS-BUILT TOPOGRAPHIC SECTIONS (3)

DATE: 1/26/2022
SHEET: 11
PROJECT NO. 3021

File name: As-built-XS-Sheet3_DL_Sears-Pt_2022-0126dag