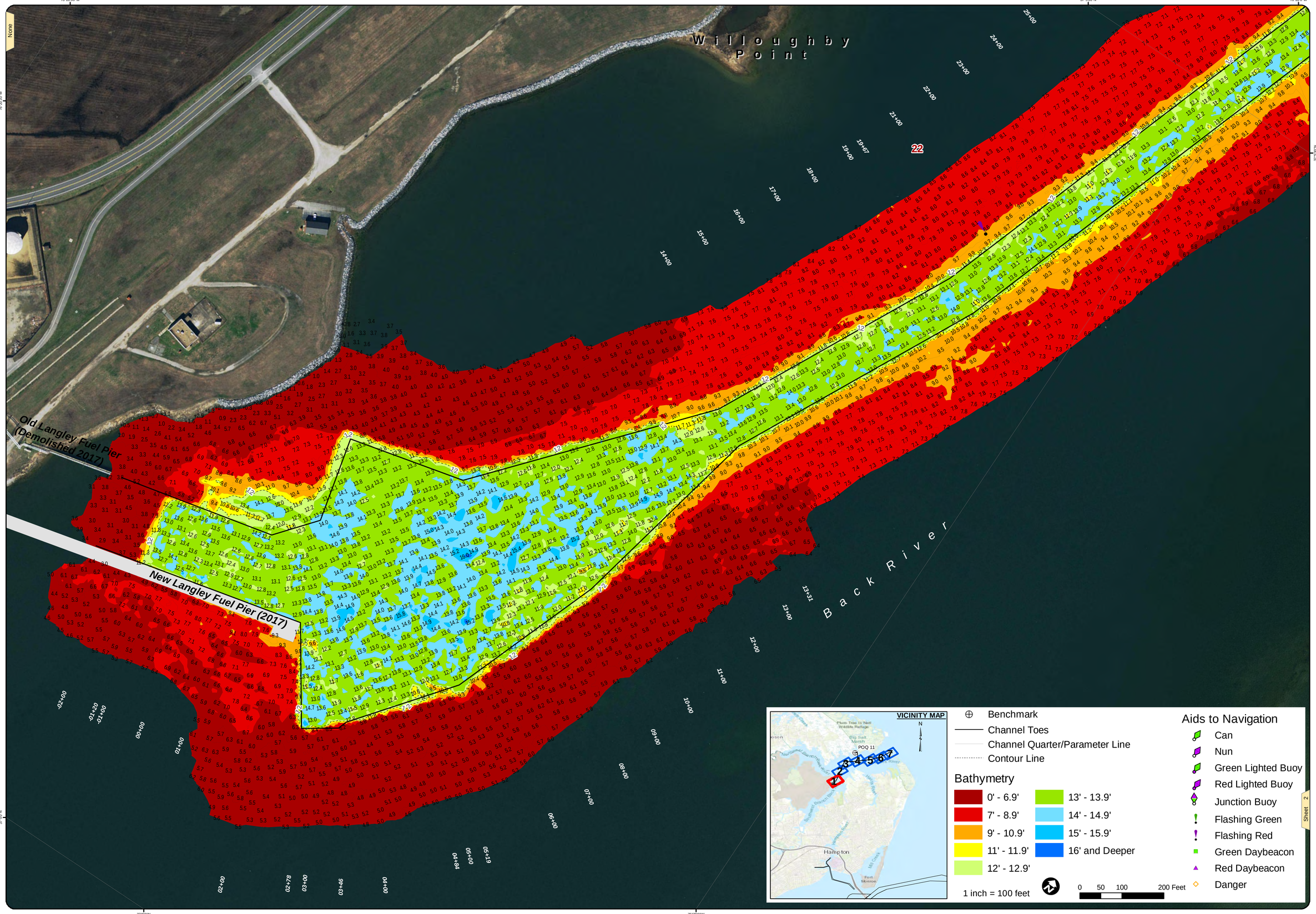

US Army Corps of Engineers
Norfolk District

NOTES:

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2. NOT FOR NAVIGATION USE. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATE(S) INDICATED & CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
3. SOUNDINGS: SHOWN IN FEET CENTERED ON POINT OF SHOALEST DEPTH IN 25 FT RADIUS GENERATED FROM HYDROSURVEY DATA.
4. BACKGROUND: VIRGINIA BASE MAPPING PROGRAM MOST RECENT IMAGERY GIS WEB SERVICE.
5. AIDS TO NAVIGATION LOCATED WITH SURVEY VESSEL +/- 10 FEET.
6. SURVEY XYZ (*.XYZ) AND METADATA (*.MET) FILE NAME REFERENCED BY eHYDRO FILE NAME.

PROJECTED COORDINATE SYSTEM: STATE PLANE
NORTH AMERICAN DATUM: NAD 83
HORIZONTAL ZONE: VIRGINIA SOUTH ZONE
PROJECTED COORDINATE UNITS: US SURVEY FEET
ELLIPSOIDAL HORIZONTAL ACCURACY: +/- 1.5 FEET
HORIZONTAL CONTROL: LEICA SMARTNET

VERTICAL REFERENCE DATUM: NGS NAVD88
TIDAL EPOCH: 1983-2001
IMPLIED VERTICAL ACCURACY: +/- 0.5 FEET
VERTICAL CONTROL: RTK/LEICA SMARTNET
TIDE NOTE: NAVD88 VERTICAL DATUM Model
SYSTEM/METHOD: MULTIBEAM
BIN SIZE: 5x5
BIN SELECTION METHOD: AVERAGE CELL CENTER

GEODETIC CONTROL MONUMENTS

MONUMENT	HALLW	NAVD88	MEAN RANGE OF TIDE	AREA
POO 11	4.91	3.37 (GEOID12B)	2.30	-02+00 to 19+50

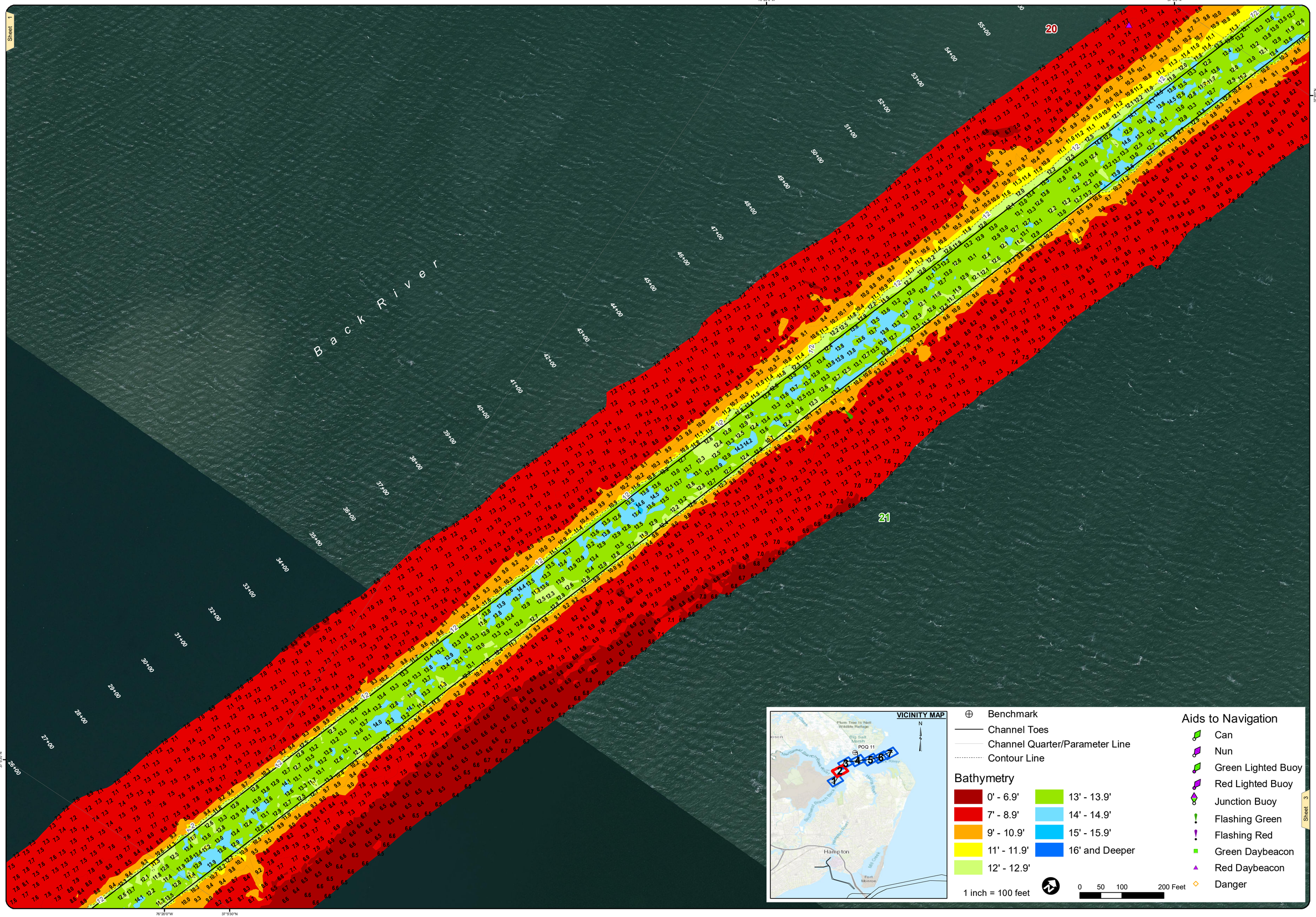
LANGLEY AFB BACK RIVER
PROJECT CONDITION SURVEY (AFTER DREDGING)
SURVEY DATES:
May 7 & June 3 & 6 & July 13 & Aug 7, 2019

SURVEY BY: USACE Team Lead: Dusty Brooke, Joe Moore, Mike Williams.
eHYDRO FILE: LB_01_LBR_20190507_AD

SHEET 1 of 7
Map Produced: 9/4/2019

APPROVED:
Jeff Swallow
Digitally signed by Jeff Swallow
Date: 2019.09.13 15:05:28 -04'00'
Chief, Navigation Analysis Section

APPROVED:
Digitally signed by LEGASPLERIC.C.1174258275
Date: 2019.09.12 06:18:28 -04'00'
Chief, Navigation Support and Survey Section



US Army Corps of Engineers
Norfolk District

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4. BACKGROUND: VIRGINIA BASE MAPPING PROGRAM MOST RECENT IMAGERY GIS WEB SERVICE.
5. AIDS TO NAVIGATION LOCATED WITH SURVEY VESSEL +/- 10 FEET.
6. SURVEY XYZ (*.XYZ) AND METADATA (*.MET) FILE NAME REFERENCED BY eHYDRO FILE NAME.

VERTICAL REFERENCE DATUM: NOS MLLW
TIDAL DATUM: NOS MLLW
IMPLIED VERTICAL ACCURACY: +/- 0.5 FEET
VERTICAL CONTROL: RTK-LEICA SMARTNET
VERTICAL MODEL: Hydrographic Datum Model
SYSTEM/METHOD: MULTI-BEAM
BIN SIZE: 5x5
BIN SELECTION METHOD: AVERAGE CELL CENTER

PROJECTED COORDINATE SYSTEM: STATE PLANE
DATUM/ELLIPSOID: NAD 83
HORIZONTAL ZONE: VIRGINIA SOUTH ZONE
PROJECTED COORDINATE UNITS: US SURVEY FEET
NATIVE HORIZONTAL ACCURACY: +/- 1.5 FEET
HORIZONTAL CONTROL: LEICA SMARTNET

GEODETIC CONTROL MONUMENTS

MONUMENT	MLLW	NAVD88	AREA
POO 11	4.91	3.37(GEOID12B)	-02+00 to 192+50
		MEAN RANGE OF TIDE	2.39

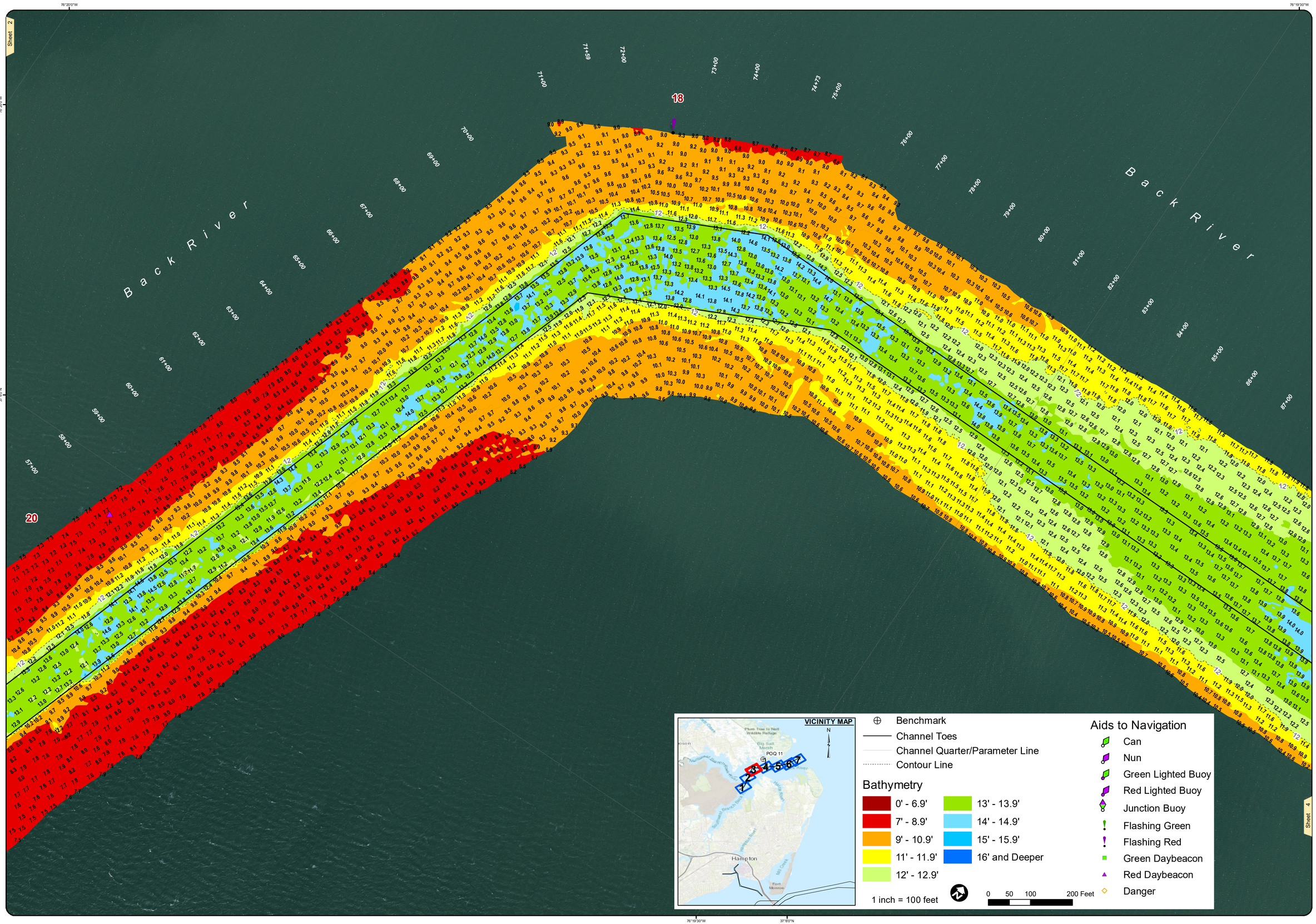
LANGLEY AFB BACK RIVER
PROJECT CONDITION SURVEY (AFTER DREDGING)
SURVEY DATES:
May 7 & June 3 & 6 & July 13 & Aug 7, 2019

SURVEY BY: USACE Team Lead: Dusty Brooks, Joe Moore, Mike Williams.
eHYDRO FILE: LB_cp_LBR_20190907_AD

SHEET 2 of 7
Map Produced: 9/10/2019

APPROVED:
Chief, Navigation Analysis Section

APPROVED:
Chief, Navigation Support and Survey Section



US Army Corps of Engineers
Norfolk District

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4. BACKGROUND: VIRGINIA BASE MAPPING PROGRAM MOST RECENT IMAGERY GIS WEB SERVICE.
5. AIDS TO NAVIGATION LOCATED WITH SURVEY VESSEL +/- 10 FEET.
6. SURVEY XYZ (*.XYZ) AND METADATA (*.MET) FILE NAME REFERENCED BY eHYDRO FILE NAME.

PROJECTED COORDINATE SYSTEM: STATE PLANE
DATUM/ELLIPSOID: NAD83/GRS80
HORIZONTAL ZONE: VIRGINIA SOUTH ZONE
PROJECTED COORDINATE UNITS: US SURVEY FEET
HORIZONTAL CONTROL ACCURACY: +/- 0.5 FEET
HORIZONTAL CONTROL: RTK/LEICA SMARTNET
VERTICAL REFERENCE DATUM: NOS MLLW
VERTICAL CONTROL: NAVD88 Geoid Model
IMPLIED VERTICAL ACCURACY: +/- 0.5 FEET
VERTICAL CONTROL: RTK/LEICA SMARTNET
SYSTEM/METHOD: MULTI-BEAM
BIN SIZE: 5x5
BIN SELECTION METHOD: AVERAGE CELL CENTER

GEODETIC CONTROL MONUMENTS

MONUMENT	MLLW	NAVD88	MEAN RANGE OF TIDE	AREA
POQ 11	4.91'	3.37 (GEOID12B)	2.90'	-02+00 to 192+50

LANGLEY AFB BACK RIVER
PROJECT CONDITION SURVEY (AFTER DREDGING)

SURVEY DATES:
May 7 & June 3 & 6 & July 13 & Aug 7, 2019

SURVEY BY: USACE Team Lead: Dusty Brooks, Joe Moore, Mike Williams.
eHYDRO FILE: LB_01_LBR_20190507_AD

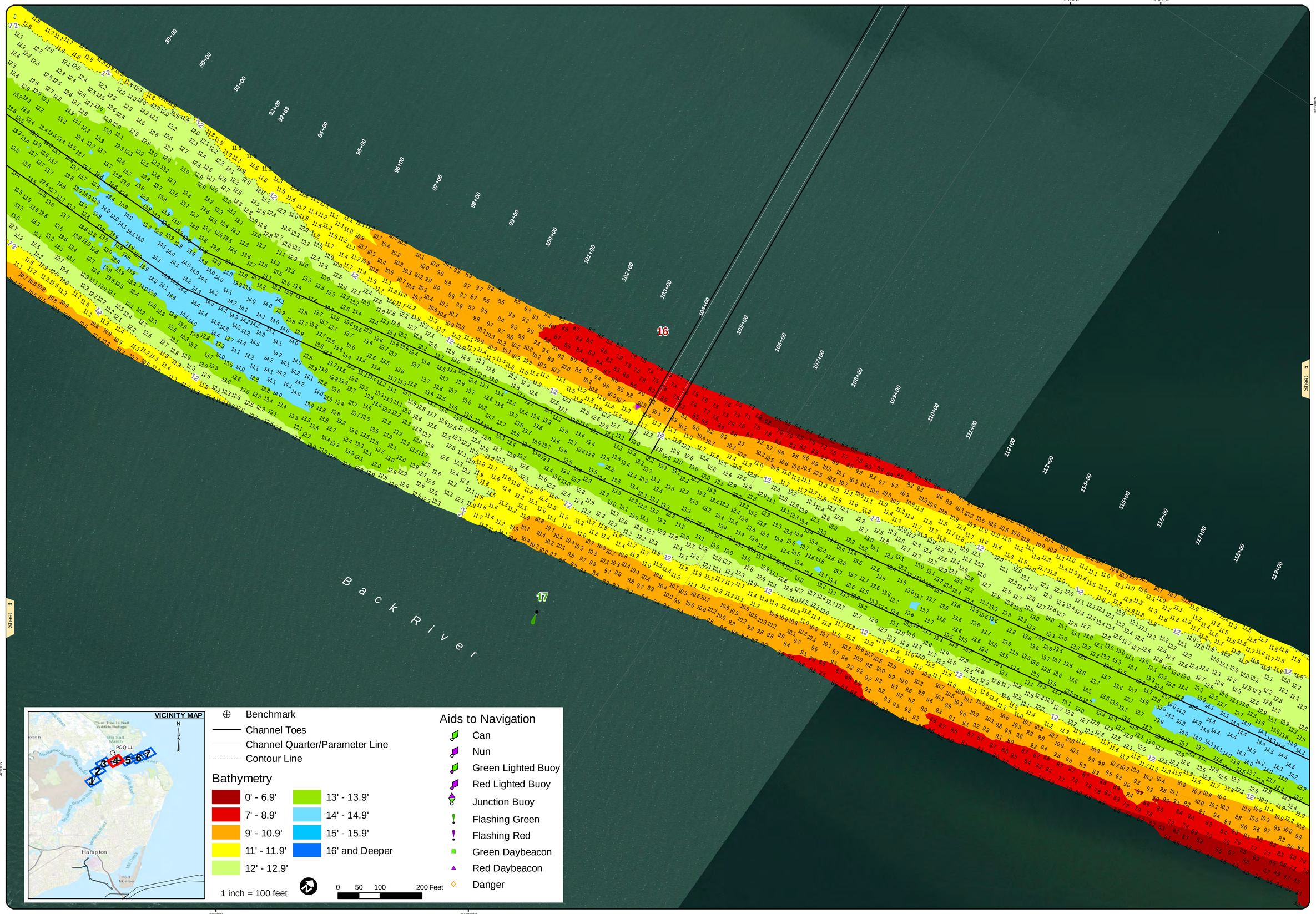
SHEET 3 of 7
Map Produced: 9/10/2019

APPROVED:

Chief, Navigation Analysis Section

APPROVED:

Chief, Navigation Support and Survey Section



US Army Corps of Engineers
Norfolk District

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4. BACKGROUND: VIRGINIA BASE MAPPING PROGRAM MOST RECENT IMAGERY GIS WEB SERVICE.
5. AIDS TO NAVIGATION LOCATED WITH SURVEY VESSEL +/- 10 FEET.
6. SURVEY XYZ (*.XYZ) AND METADATA (*.MET) FILE NAME REFERENCED BY eHYDRO FILE NAME.

VERTICAL REFERENCE DATUM:	NOS MLLW
TIDAL DATUM:	NOS 8638610
IMPLIED VERTICAL ACCURACY:	+/- 0.5 FEET
VERTICAL CONTROL:	RTK/LEICA SMARTNET
VERTICAL METHOD:	+/- 0.5 FEET RTK/LEICA SMARTNET
SYSTEM/METHOD:	MULTIBEAM
BIN SIZE:	5X5
BIN SELECTION METHOD:	AVERAGE CELL CENTER

PROJECTED COORDINATE SYSTEM:	STATE PLANE
TRANSVERSE MERCATOR	NAD83
HORIZONTAL ZONE:	VIRGINIA SOUTH ZONE
PROJECTED COORDINATE UNITS:	US SURVEY FEET
HORIZONTAL DATUM:	NAD83 (2011)
HORIZONTAL CONTROL:	LEICA SMARTNET

GEODETIC CONTROL MONUMENTS

MONUMENT	MLLW	NAVD88	MEAN RANGE OF TIDE	AREA
POQ 11	4.91	3.37 (GEOID12B)	2.30	-02+00 to 192+50

LANGLEY AFB BACK RIVER

PROJECT CONDITION SURVEY (AFTER DREDGING)

SURVEY DATES:
May 7 & June 3 & 6 & July 13 & Aug 7, 2019

SURVEY BY: USACE Team Lead: Dusty Brooke, Joe Moore, Mike Williams.
eHYDRO FILE: LB_01, LBR_20190507, AD

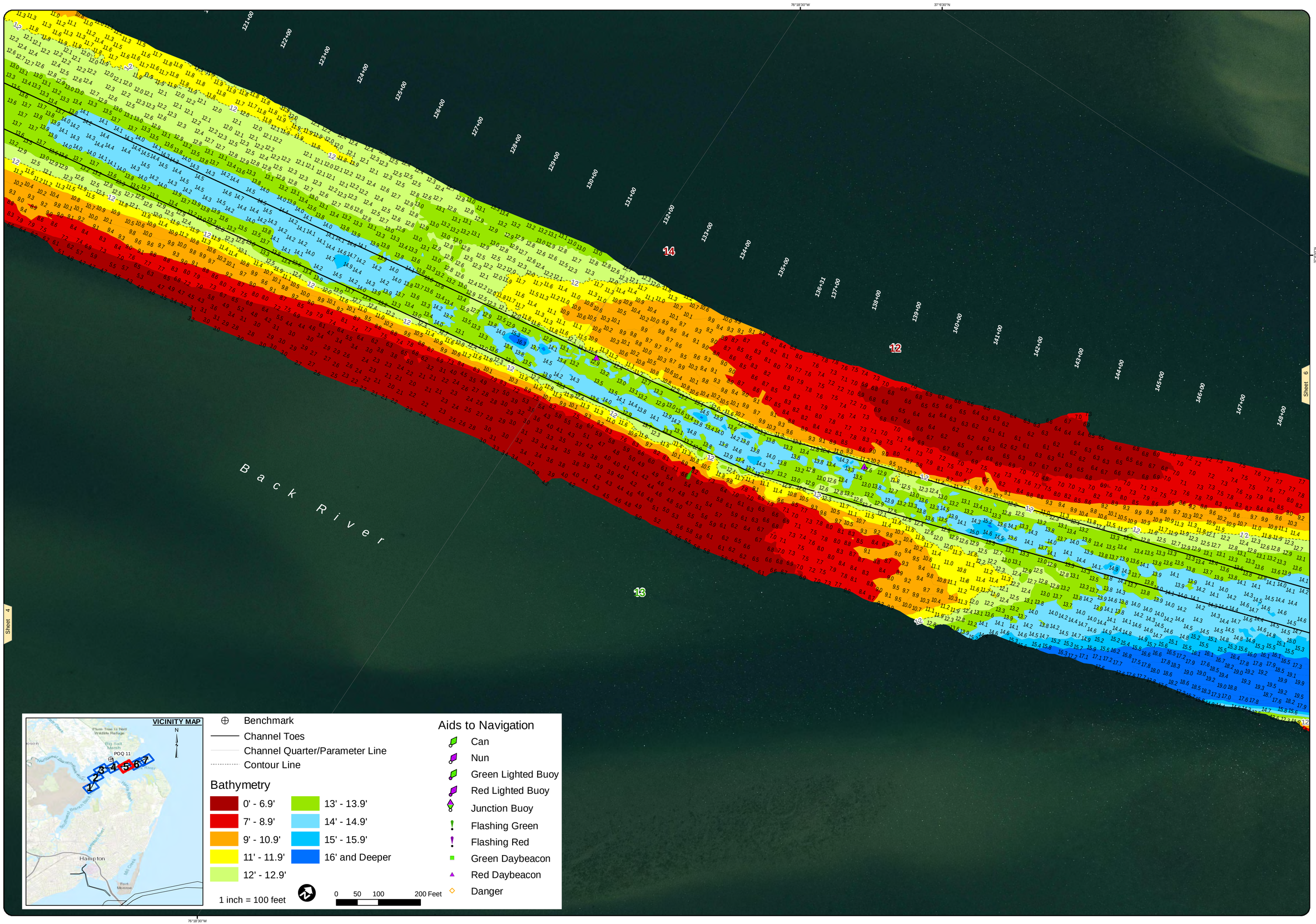
SHEET 4 of 7
Map Produced: 9/4/2019

APPROVED:

Chief, Navigation Analysis Section

APPROVED:

Chief, Navigation Support and Survey Section



US Army Corps of Engineers
Norfolk District

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4. BACKGROUND: VIRGINIA BASE MAPPING PROGRAM MOST RECENT IMAGERY GIS WEB SERVICE.
5. AIDS TO NAVIGATION LOCATED WITH SURVEY VESSEL +/- 10 FEET.
6. SURVEY XYZ (*.XYZ) AND METADATA (*.MET) FILE NAME REFERENCED BY eHYDRO FILE NAME.

VERTICAL REFERENCE DATUM:	NOS MLLW
TIDAL DATUM:	NOS 8638614
IMPLIED VERTICAL ACCURACY:	+/- 0.5 FEET
VERTICAL CONTROL:	RTK/LEICA SMARTNET
VERTICAL METHOD:	TIDE: NOAA Gridded Model
SYSTEM/METHOD:	MULTIBEAM
BIN SIZE:	5x5
BIN SELECTION METHOD:	AVERAGE CELL CENTER

PROJECTED COORDINATE SYSTEM:	STATE PLANE
DATUM/ELLIPSOID:	NAD83/GRS80
HORIZONTAL ZONE:	VIRGINIA SOUTH ZONE
PROJECTED COORDINATE UNITS:	US SURVEY FEET
HORIZONTAL ACCURACY:	+/- 0.25 feet
HORIZONTAL CONTROL:	LEICA SMARTNET

GEODETIC CONTROL MONUMENTS

MONUMENT	MLLW	NAVD88	MEAN RANGE OF TIDE	AREA
POQ 11	4.91'	3.37'(GEOID12B)	2.30'	-02+00 to 192+50

LANGLEY AFB BACK RIVER
PROJECT CONDITION SURVEY (AFTER DREDGING)

SURVEY DATES:
May 7 & June 3 & 6 & July 13 & Aug 7, 2019

SURVEY BY: USACE Team Lead: Dusty Brooke, Joe Moore, Mike Williams.
eHYDRO FILE: LB_01_LBR_20190507_AD

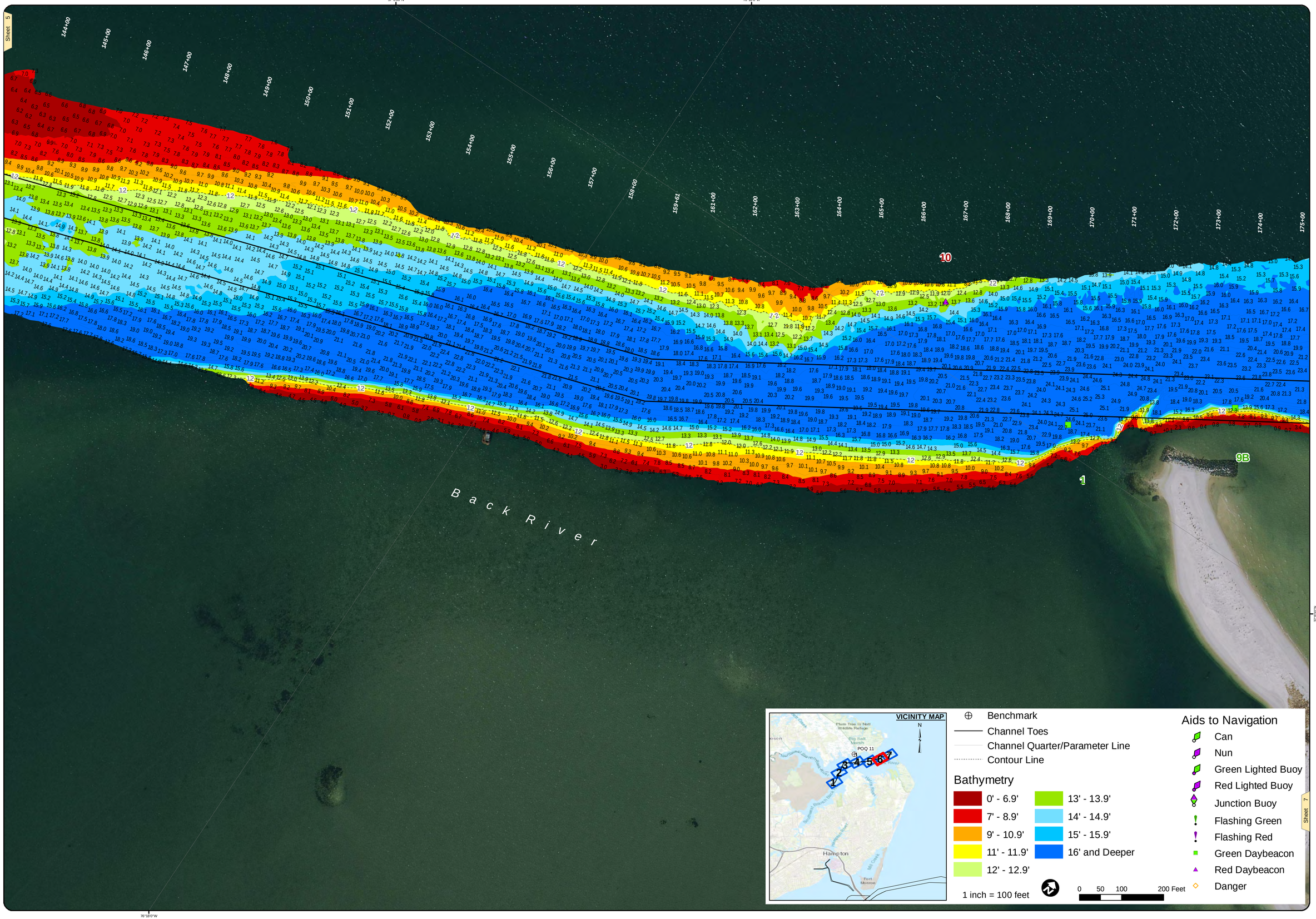
SHEET 5 of 7
Map Produced: 9/4/2019

APPROVED:

Chief, Navigation Analysis Section

APPROVED:

Chief, Navigation Support and Survey Section



US Army Corps of Engineers
Norfolk District

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4. BACKGROUND: VIRGINIA BASE MAPPING PROGRAM MOST RECENT IMAGERY GIS WEB SERVICE.
5. AIDS TO NAVIGATION LOCATED WITH SURVEY VESSEL +/- 10 FEET.
6. SURVEY XYZ (*.XYZ) AND METADATA (*.MET) FILE NAME REFERENCED BY eHYDRO FILE NAME.

PROJECTED COORDINATE SYSTEM: STATE PLANE
DATUM/ELLIPSOID: NAD83
HORIZONTAL ZONE: VIRGINIA SOUTH ZONE
PROJECTED COORDINATE UNITS: US SURVEY FEET
IMPLIED HORIZONTAL ACCURACY: +/- 0.5 feet
HORIZONTAL CONTROL: LEICA SMARTNET

VERTICAL REFERENCE DATUM: NOS MLLW
VERTICAL DATUM: NAVD88
IMPLIED VERTICAL ACCURACY: +/- 0.5 FEET
VERTICAL CONTROL: RTK-LEICA SMARTNET
RESPONSE EQUATION: Reson Seabat Multibeam Model
SYSTEM/METHOD: MULTIBEAM
BIN SIZE: 5x5
BIN SELECTION METHOD: AVERAGE CELL CENTER

GEODETIC CONTROL MONUMENTS

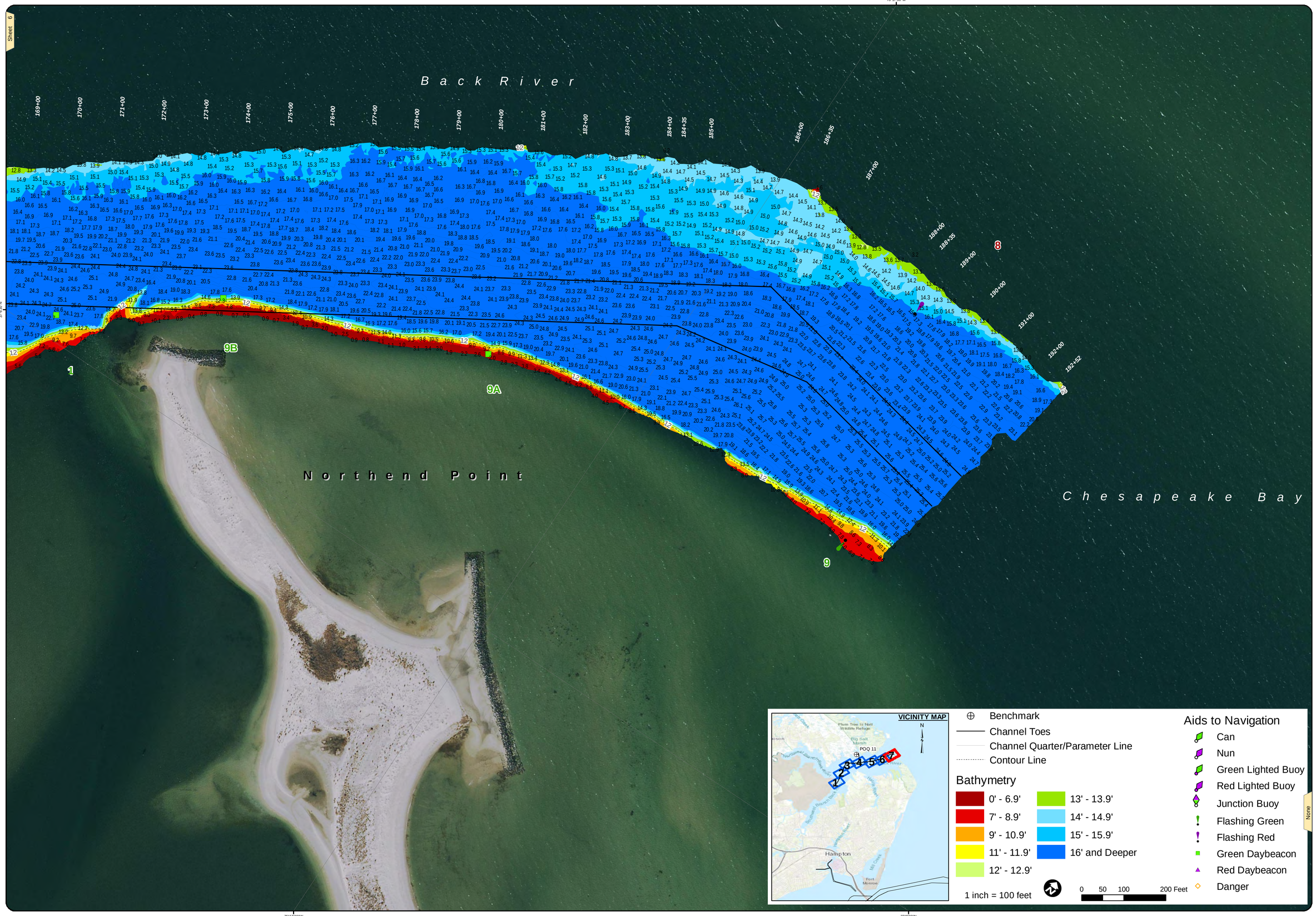
MONUMENT	MLLW	NAVD88	MEAN RANGE OF TIDE:	AREA
POQ 11	4.91'	3.37'(GEOID12B)	2.36'	-02+00 to 192+50

LANGLEY AFB BACK RIVER
PROJECT CONDITION SURVEY (AFTER DREDGING)
SURVEY DATES:
May 7 & June 3 & 6 & July 13 & Aug 7, 2019

SURVEY BY: USACE Team Lead: Dusty Brooke, Joe Moore, Mike Williams.
eHYDRO FILE: LB_01_LBR_20190507_AD

SHEET 6 of 7
Map Produced: 9/4/2019

APPROVED:
Chief, Navigation Analysis Section
APPROVED:
Chief, Navigation Support and Survey Section



Sheet 6

US Army Corps of Engineers
Norfolk District

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4. BACKGROUND: VIRGINIA BASE MAPPING PROGRAM MOST RECENT IMAGERY GIS WEB SERVICE.
5. AIDS TO NAVIGATION LOCATED WITH SURVEY VESSEL +/- 10 FEET.
6. SURVEY XYZ (*.XYZ) AND METADATA (*.MET) FILE NAME REFERENCED BY eHYDRO FILE NAME.

PROJECTED COORDINATE SYSTEM: STATE PLANE
DATUM/ZONE: NAD 83
HORIZONTAL ZONE: VIRGINIA SOUTH ZONE
PROJECTED COORDINATE UNITS: US SURVEY FEET
NATIVE HORIZONTAL ACCURACY: +/- 0.5 Feet
HORIZONTAL CONTROL: LEICA SMARTNET

VERTICAL REFERENCE DATUM: NGS MLLW
TIDE ZONE: 3195 (PORTSMOUTH)
IMPLIED VERTICAL ACCURACY: +/- 0.5 FEET
VERTICAL CONTROL: RTK-LEICA SMARTNET
NATIVE VERTICAL DATUM: NGS Geoid Model GEOID12B
SYSTEM/METHOD: MULTI-BEAM
BIN SIZE: 5X5
BIN SELECTION METHOD: AVERAGE CELL CENTER

GEODETIC CONTROL MONUMENTS

MONUMENT	MLLW	NAVD88	MEAN RANGE OF TIDE	AREA
POQ 11	4.91'	3.37'(GEOID12B)	2.39'	-(02+00 to 192+52)

LANGLEY AFB BACK RIVER
PROJECT CONDITION SURVEY (AFTER DREDGING)
SURVEY DATES:
May 7 & June 3 & 6 & July 13 & Aug 7, 2019

SURVEY BY: USACE Team Lead: Dusty Brooke, Joe Moore, Mike Williams.
eHYDRO FILE: LB_01_LBR_20190607_AD

SHEET 7 of 7
Map Produced: 9/4/2019

APPROVED:
Chief, Navigation Analysis Section

APPROVED:
Chief, Navigation Support and Survey Section