

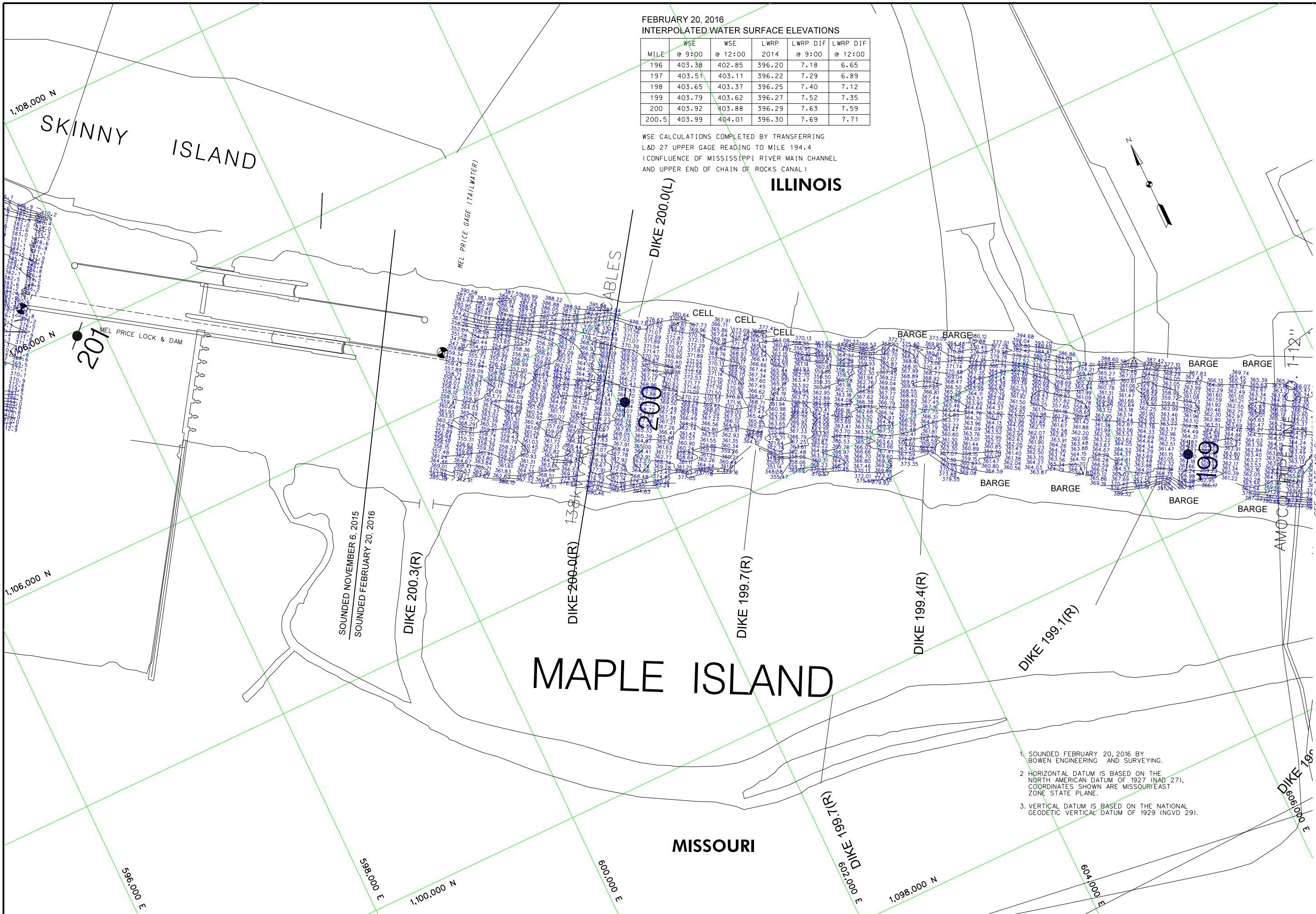


US Army Corps of Engineers  
St. Louis District

FEBRUARY 20, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE		LWRP		LWRP DIF	
	@ 9:00	@ 12:00	2014	@ 9:00	@ 12:00	
196	403.38	402.85	396.20	7.18	6.65	
197	403.51	403.11	396.22	7.29	6.89	
198	403.65	403.37	396.25	7.40	7.12	
199	403.79	403.62	396.27	7.52	7.35	
200	403.92	403.88	396.29	7.63	7.59	
200.5	403.99	404.01	396.30	7.69	7.71	

WSE CALCULATIONS COMPLETED BY TRANSFERRING  
L&D 27 UPPER GAGE READING TO MILE 194.4  
(CONFLUENCE OF MISSISSIPPI RIVER MAIN CHANNEL  
AND UPPER END OF CHAIN OF ROCKS CANAL)



GAGE RECORD	
L&D 27 UPPER	CHAIN OF ROCKS NO
150.00	MEL PRICE LAO TW
194.4	305.48
MILE	200.5
LWRP 2014	190.4
LWRP 2016	190.4
20 FEB 2016	153.88(900) 52.4(10200)
	X
	X
	8.519(900) 8.519(200)

SURVEY DATA	
Survey Date:	FEBRUARY 20, 2016
Drawn by:	BOWEN ENGINEERING
Reviewed by:	X
Checked by:	X
Submitted:	X
Approved:	X
File name:	MISSISSIPPI RIVER

U.S. ARMY ENGINEER DIVISION  
CORPS OF ENGINEERS  
ST. LOUIS, MISSOURI

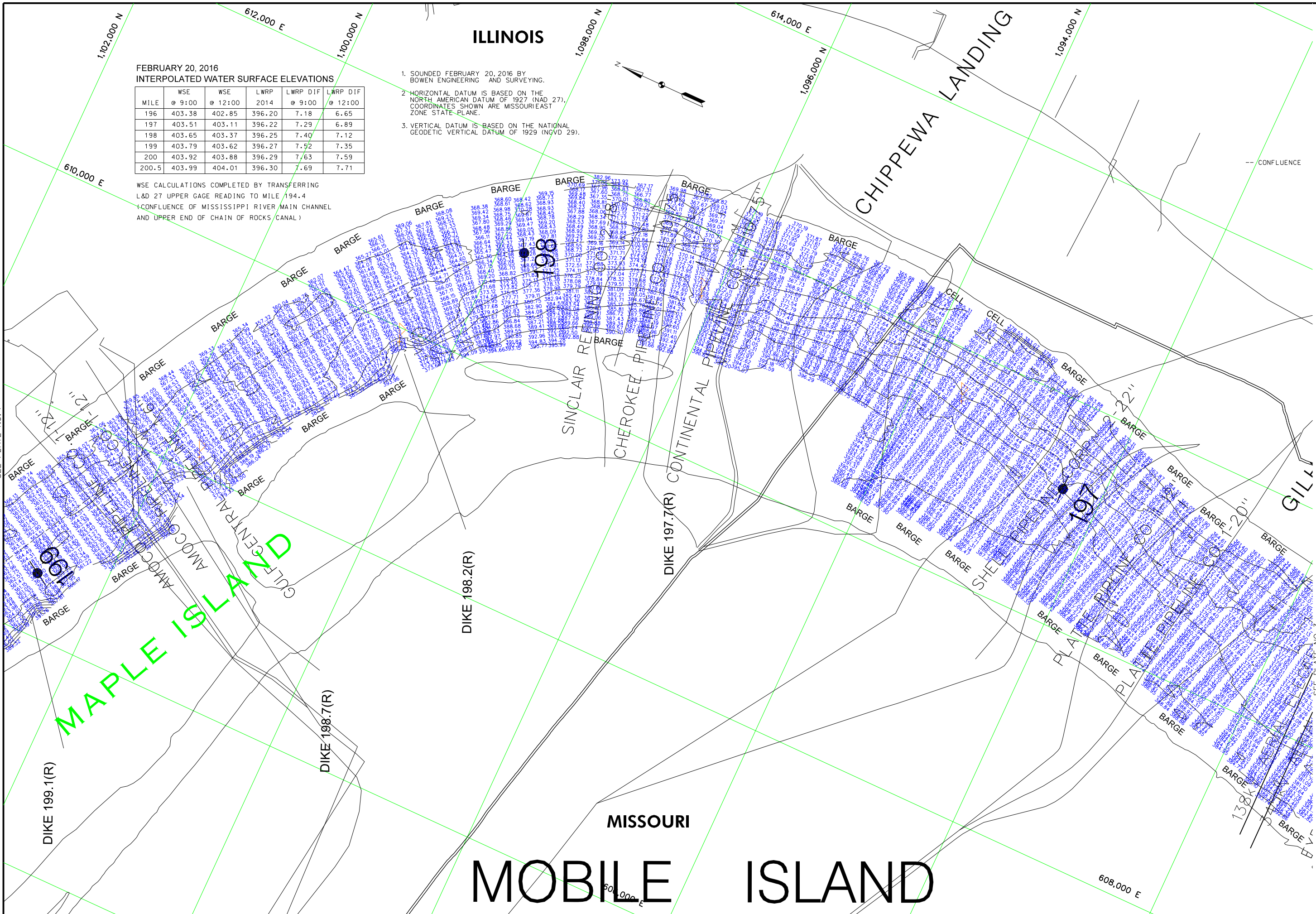
UPPER MISSISSIPPI RIVER BASIN  
MISSISSIPPI RIVER

HYDROGRAPHIC SURVEYS  
RIVER MILES 198.9 - 200.6

PLATE NUMBER  
1

- SOUNDED FEBRUARY 20, 2016 BY BOWEN ENGINEERING AND SURVEYING.
- HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURI/EAST ZONE STATE PLANE.
- VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

SEE PLATE NO. 2



FEBRUARY 20, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 12:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 12:00
196	403.38	402.85	396.20	7.18	6.65
197	403.51	403.11	396.22	7.29	6.89
198	403.65	403.37	396.25	7.40	7.12
199	403.79	403.62	396.27	7.52	7.35
200	403.92	403.88	396.29	7.63	7.59
200.5	403.99	404.01	396.30	7.69	7.71

WSE CALCULATIONS COMPLETED BY TRANSFERRING L&D 27 UPPER GAGE READING TO MILE 194.4 (CONFLUENCE OF MISSISSIPPI RIVER MAIN CHANNEL AND UPPER END OF CHAIN OF ROCKS CANAL)

1. SOUNDED FEBRUARY 20, 2016 BY BOWEN ENGINEERING AND SURVEYING.
2. HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURI EAST ZONE STATE PLANE.
3. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).



GAGE RECORD	
L&D 27 UPPER	CHAIN OF ROCKS NO
MILE	REL. PRICE L&D TW
LWRP 2014	DATE
20 FEB 2016	15:30:00 52.4412(20)
20 FEB 2016	15:30:00 52.4412(20)

SURVEY DATA	
SURVEY DATE	FEBRUARY 20, 2016
Drawn by	Reviewed by
Submitted	Approved
FILE NAME	Plot date

HYDROGRAPHIC SURVEYS	
U.S. ARMY ENGINEER DIVISION	CORPS OF ENGINEERS
ST. LOUIS, MISSOURI	UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER	MISSISSIPPI RIVER

PLATE NUMBER  
2





US Army Corps of Engineers  
St. Louis District

GAGE RECORD	
CHAM. OF ROCKS, MO	REL. PRICE (L&D) TW
185.3	305.48
190.4	200.5
194.4	X
196.0	X
10.85(8:00) (L&D) (20)	X
03 FEB 2016 (5:17:00) (L&D) (20)	X
09 FEB 2016 (5:46:00) (L&D) (20)	X
88.00(8:00)	80.23(8:00) (L&D) (20)

SURVEY DATA	
FEBRUARY 3 & 9, 2016	
Drawn by: BOWEN ENGINEERING	Reviewed by: X
Submitted: X	Approved: X
File name: (blank)	Plot date: (blank)
U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	
UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER	

120	240 METERS
0	0
400	800 FEET
800	1600 FEET
THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS CONDUCTED IN ACCORDANCE WITH THE GENERAL CONDITIONS OF CONTRACT FOR HYDROGRAPHIC SURVEYS	
RIVER MILES 192.6 - 194.5	
PLATE NUMBER	
4	

FEBRUARY 9, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

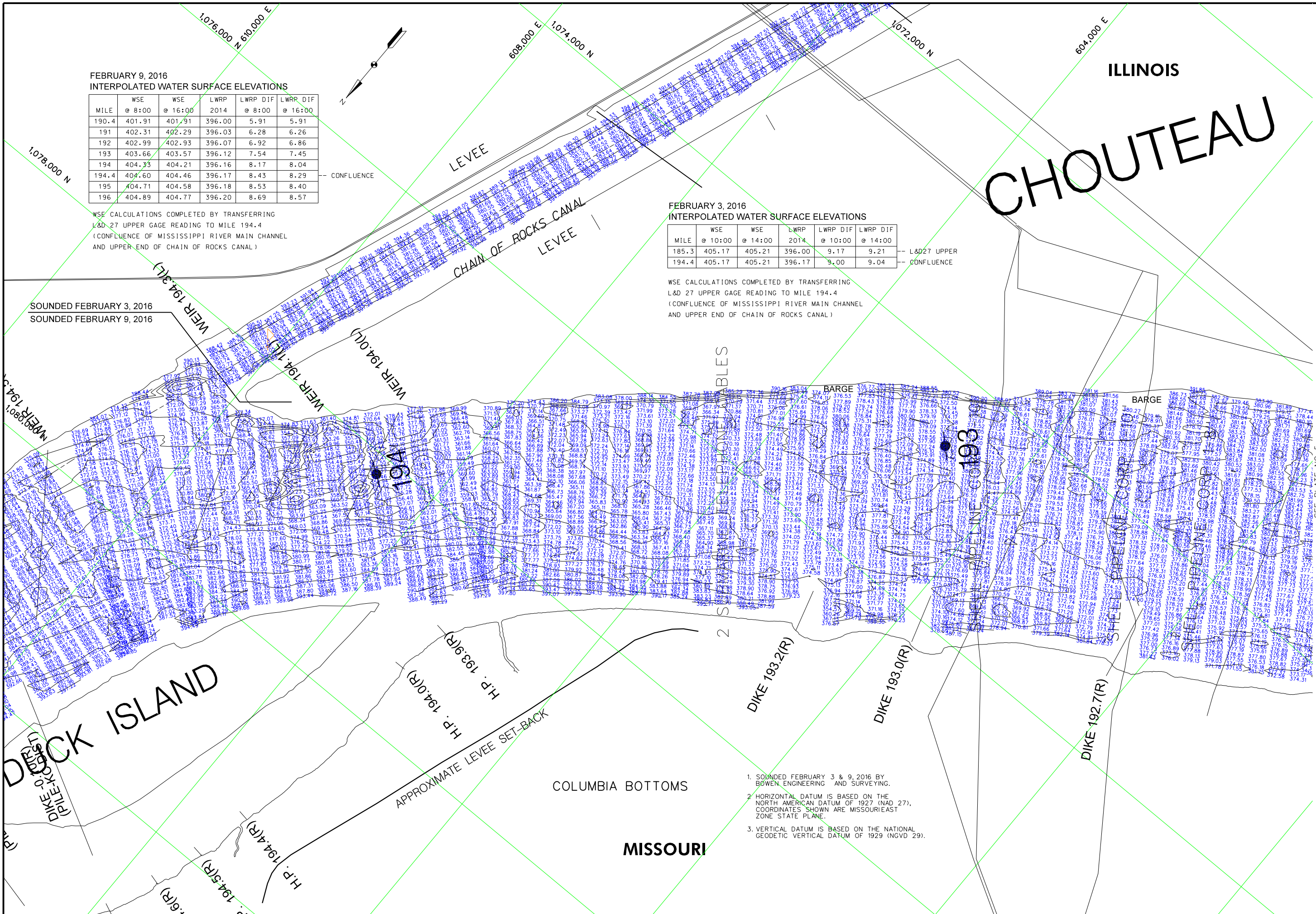
MILE	WSE @ 8:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 16:00
190.4	401.91	401.91	396.00	5.91	5.91
191	402.31	402.29	396.03	6.28	6.26
192	402.99	402.93	396.07	6.92	6.86
193	403.66	403.57	396.12	7.54	7.45
194	404.33	404.21	396.16	8.17	8.04
194.4	404.60	404.46	396.17	8.43	8.29
195	404.71	404.58	396.18	8.53	8.40
196	404.89	404.77	396.20	8.69	8.57

WSE CALCULATIONS COMPLETED BY TRANSFERRING  
L&D 27 UPPER GAGE READING TO MILE 194.4  
(CONFLUENCE OF MISSISSIPPI RIVER MAIN CHANNEL  
AND UPPER END OF CHAIN OF ROCKS CANAL)

FEBRUARY 3, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 14:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 14:00
185.3	405.17	405.21	396.00	9.17	9.21
194.4	405.17	405.21	396.17	9.00	9.04

WSE CALCULATIONS COMPLETED BY TRANSFERRING  
L&D 27 UPPER GAGE READING TO MILE 194.4  
(CONFLUENCE OF MISSISSIPPI RIVER MAIN CHANNEL  
AND UPPER END OF CHAIN OF ROCKS CANAL)



1. SOUNDED FEBRUARY 3 & 9, 2016 BY BOWEN ENGINEERING AND SURVEYING.
2. HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURI EAST ZONE STATE PLANE.
3. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

SEE PLATE NO. 5





FEBRUARY 3, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 14:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 14:00	
185.3	405.17	405.21	396.00	9.17	9.21	-- L&D27 UPPER
194.4	405.17	405.21	396.17	9.00	9.04	-- CONFLUENCE

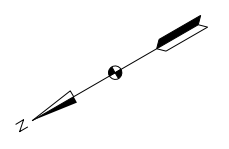
WSE CALCULATIONS COMPLETED BY TRANSFERRING  
L&D 27 UPPER GAGE READING TO MILE 194.4  
(CONFLUENCE OF MISSISSIPPI RIVER MAIN CHANNEL  
AND UPPER END OF CHAIN OF ROCKS CANAL)

1. SOUNDED FEBRUARY 3 & 4, 2016 BY BOWEN ENGINEERING AND SURVEYING.
2. HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURI EAST ZONE STATE PLANE.
3. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

FEBRUARY 4, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 17:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 17:00	
183	396.11	396.55	376.74	19.37	19.81	
183.3	396.19	396.63	376.74	19.45	19.89	-- LOWER CONFLUENCE
184	396.37	396.82	376.74	19.63	20.08	
185.1	396.37	396.82	376.74	19.63	20.08	

WSE CALCULATIONS COMPLETED BY TRANSFERRING  
L&D 27 LOWER GAGE READING TO MILE 184.0



ILLINOIS

ILLINOIS

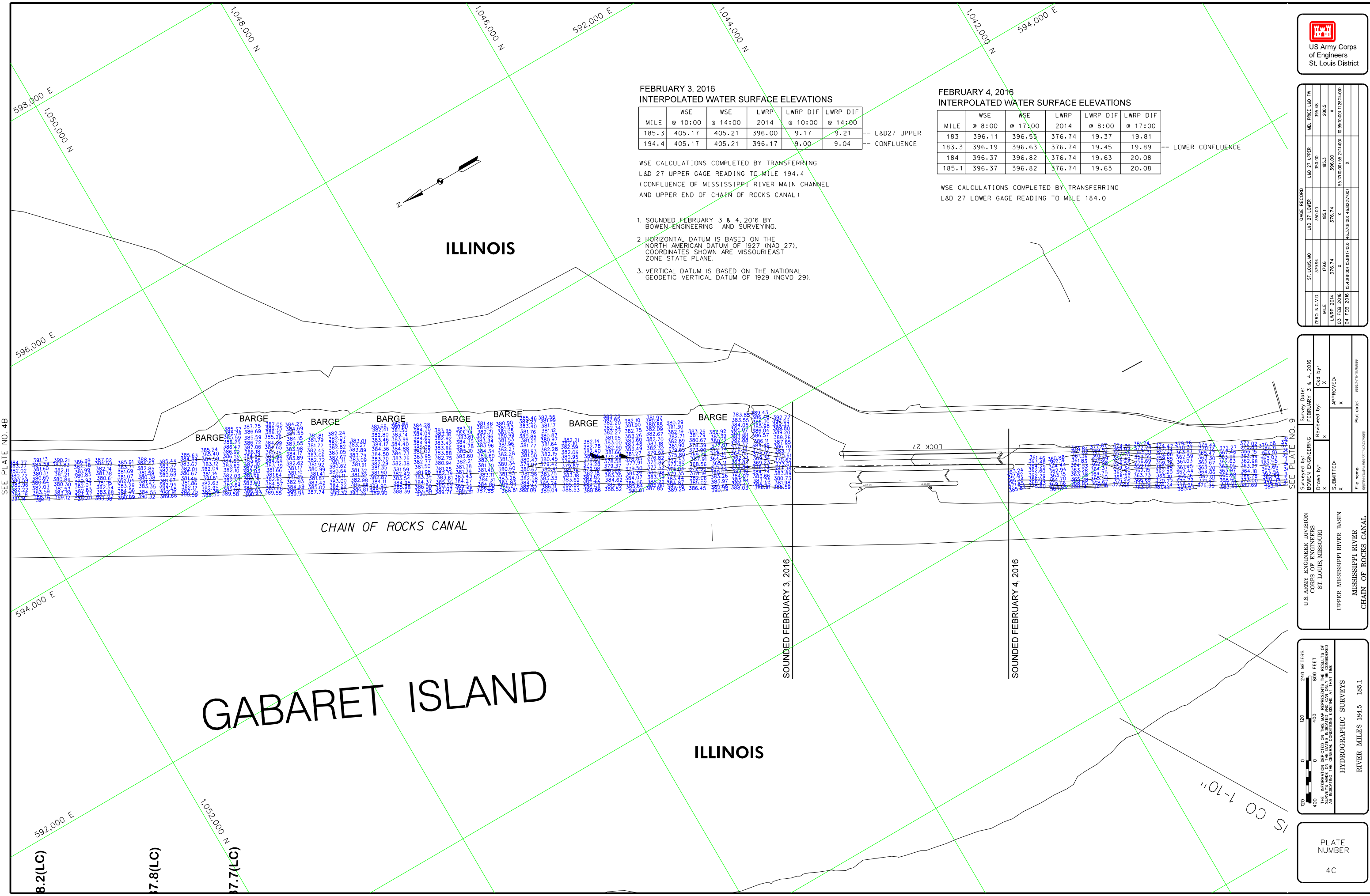
GABARET ISLAND

CHAIN OF ROCKS CANAL

LOCK 27

SEE PLATE NO. 4B

SEE PLATE NO. 9



GAGE RECORD

ST. LOUIS, MO	L&D 27 UPPER	L&D 27 LOWER	ME. PRICE L&D TN
379.94	350.00	350.00	395.48
179.6	98.1	98.1	200.5
376.74	376.74	376.74	X
15.408(00) 15.817(00)	46.378(00) 46.817(00)	X	

U.S. ARMY ENGINEER DIVISION  
CORPS OF ENGINEERS  
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN  
MISSISSIPPI RIVER  
CHAIN OF ROCKS CANAL

Survey Date: FEBRUARY 3 & 4, 2016

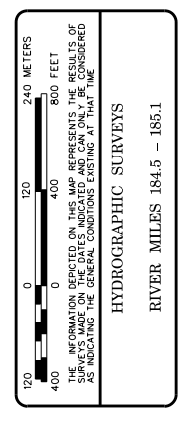
Drawn by: BOWEN ENGINEERING

Reviewed by: [Signature]

Checked by: [Signature]

APPROVED: [Signature]

FILE NAME: [Text]



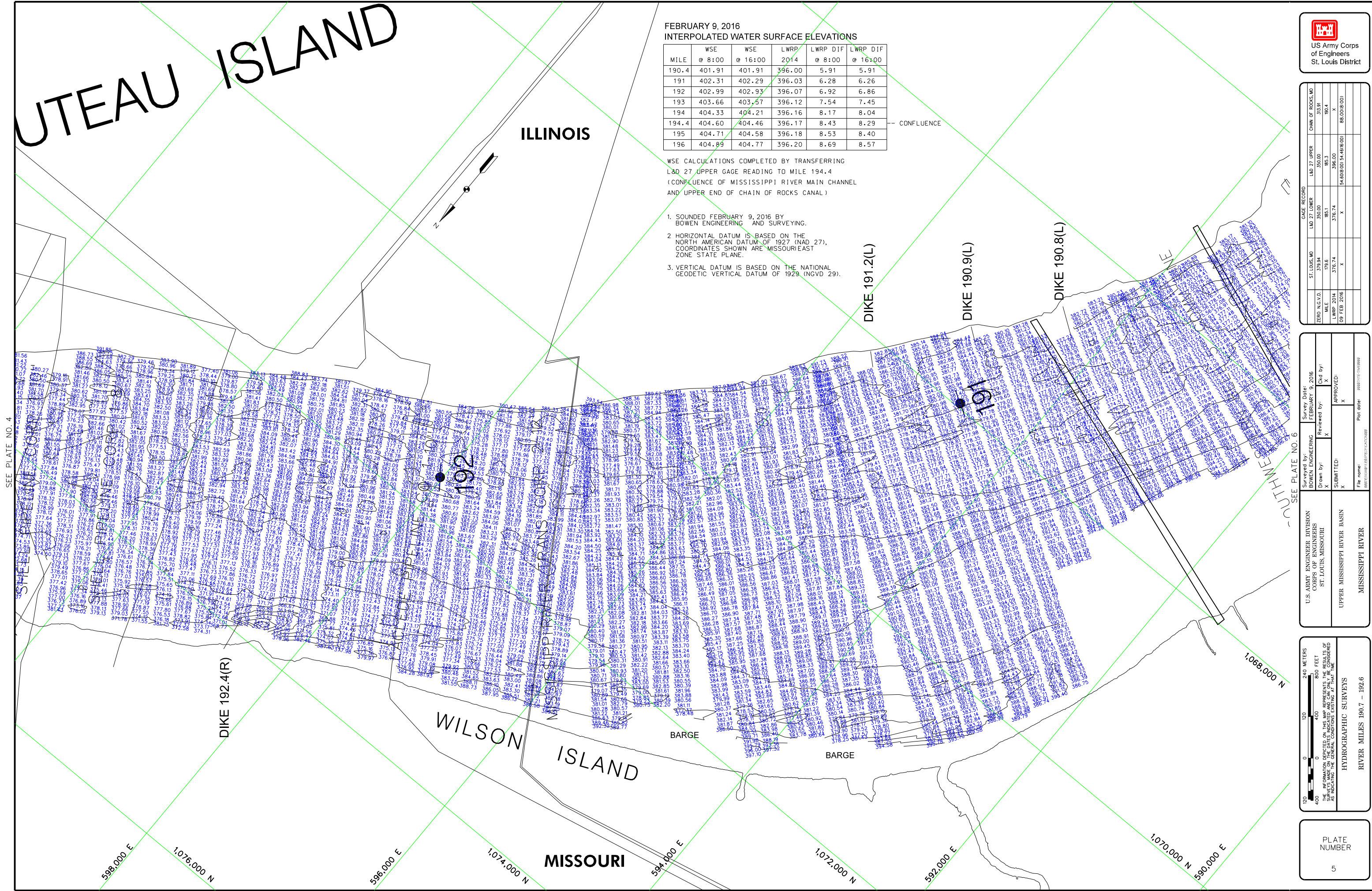
# LAKE UTEAU ISLAND

## FEBRUARY 9, 2016 INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 16:00
190.4	401.91	401.91	396.00	5.91	5.91
191	402.31	402.29	396.03	6.28	6.26
192	402.99	402.93	396.07	6.92	6.86
193	403.66	403.57	396.12	7.54	7.45
194	404.33	404.21	396.16	8.17	8.04
194.4	404.60	404.46	396.17	8.43	8.29
195	404.71	404.58	396.18	8.53	8.40
196	404.89	404.77	396.20	8.69	8.57

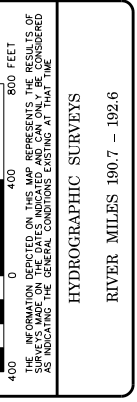
WSE CALCULATIONS COMPLETED BY TRANSFERRING  
L&D 27 UPPER GAGE READING TO MILE 194.4  
(CONFLUENCE OF MISSISSIPPI RIVER MAIN CHANNEL  
AND UPPER END OF CHAIN OF ROCKS CANAL)

1. SOUNDED FEBRUARY 9, 2016 BY BOWEN ENGINEERING AND SURVEYING.
2. HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURI EAST ZONE STATE PLANE.
3. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).



ST. LOUIS, MO	CHAIN OF ROCKS, MO
379.94	33.91
179.6	190.4
376.74	X
54.608(00) 54.40(6300)	88.00(6300)

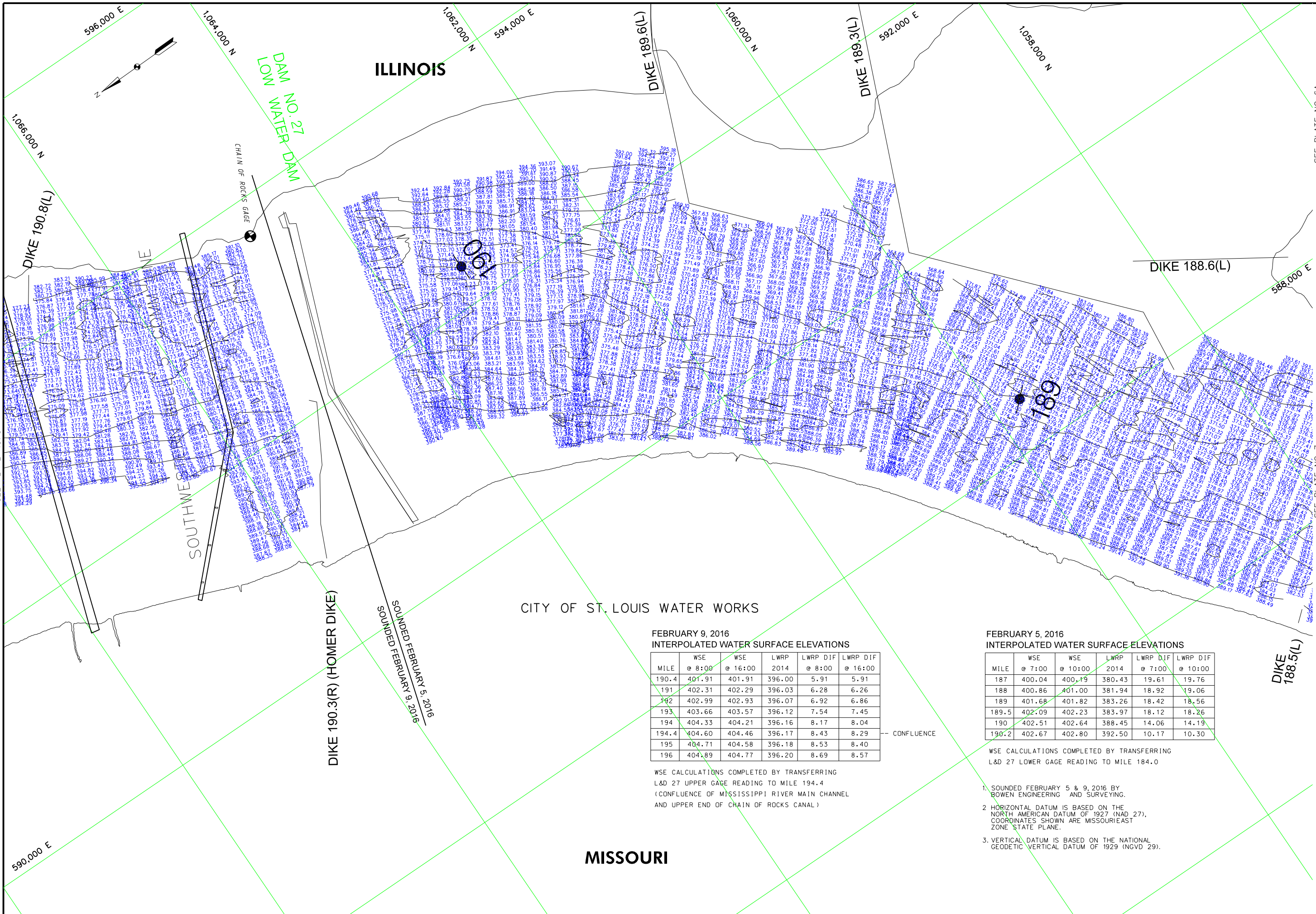
U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	UPPER MISSISSIPPI RIVER BASIN	MISSISSIPPI RIVER
Drawn by: X	Submitted: X	File name: 160209R010010000000
Reviewed by: X	Approved: X	Plot date: 02/09/2016
Checked by: X	Checked by: X	Checked by: X







US Army Corps of Engineers  
St. Louis District



SEE PLATE NO. 5

SEE PLATE NO. 6A

ST. LOUIS, MO	L&D 27 LOWER	L&D 27 UPPER	CHAIN OF ROCKS, MO
ZERO NGVD	379.94	350.00	333.91
MILE	179.6	98.1	190.4
LWRP 2014	376.74	376.74	396.00
05 FEB 2016	8-497.000	8-497.000	47.571.000
09 FEB 2016	X	X	X
			54.608.000
			88.000.000

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	UPPER MISSISSIPPI RIVER BASIN	MISSISSIPPI RIVER
Survey Date: FEBRUARY 5 & 9, 2016	Drawn by: X	Reviewed by: X
Checked by: X	Submitted: X	Approved: X
File name: \\STL\GIS\PROJECTS\2016\20160205\20160205_160205_160205_160205.dwg	Plot date: 2/11/2016	Plot time: 10:00:00 AM

240 METERS	800 FEET
0	0
400	400

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS CONDUCTED IN ACCORDANCE WITH THE GENERAL CONDITIONS OF CONTRACT FOR HYDROGRAPHIC SURVEYS.

PLATE NUMBER  
6

CITY OF ST. LOUIS WATER WORKS

FEBRUARY 9, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 16:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 16:00
190.4	401.91	401.91	396.00	5.91	5.91
191	402.31	402.29	396.03	6.28	6.26
192	402.99	402.93	396.07	6.92	6.86
193	403.66	403.57	396.12	7.54	7.45
194	404.33	404.21	396.16	8.17	8.04
194.4	404.60	404.46	396.17	8.43	8.29
195	404.71	404.58	396.18	8.53	8.40
196	404.89	404.77	396.20	8.69	8.57

WSE CALCULATIONS COMPLETED BY TRANSFERRING L&D 27 UPPER GAGE READING TO MILE 194.4 (CONFLUENCE OF MISSISSIPPI RIVER MAIN CHANNEL AND UPPER END OF CHAIN OF ROCKS CANAL)

FEBRUARY 5, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

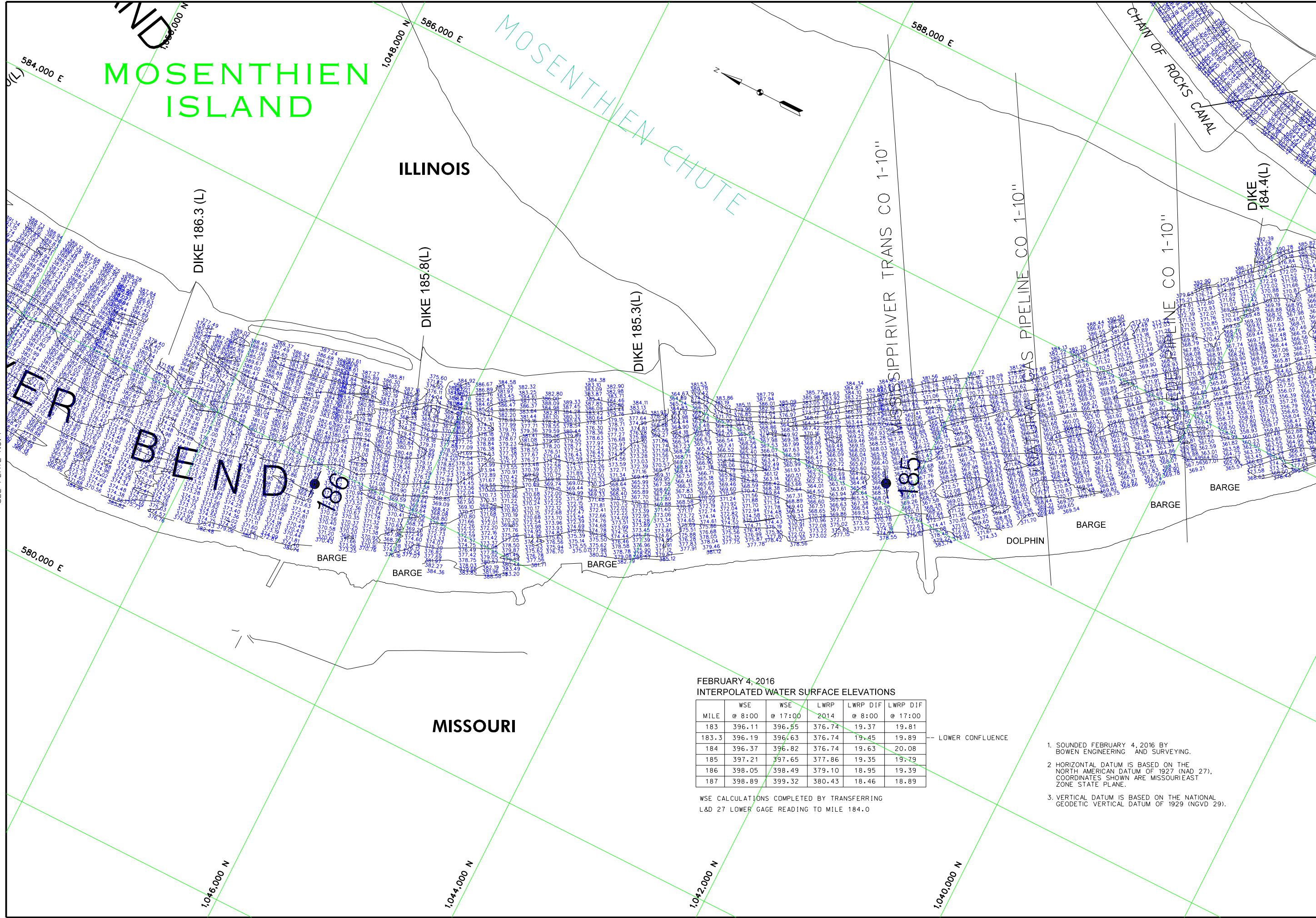
MILE	WSE @ 7:00	WSE @ 10:00	LWRP 2014	LWRP DIF @ 7:00	LWRP DIF @ 10:00
187	400.04	400.19	380.43	19.61	19.76
188	400.86	401.00	381.94	18.92	19.06
189	401.68	401.82	383.26	18.42	18.56
189.5	402.09	402.23	383.97	18.12	18.26
190	402.51	402.64	388.45	14.06	14.19
190.2	402.67	402.80	392.50	10.17	10.30

WSE CALCULATIONS COMPLETED BY TRANSFERRING L&D 27 LOWER GAGE READING TO MILE 184.0

- SOUNDED FEBRUARY 5 & 9, 2016 BY BOWEN ENGINEERING AND SURVEYING.
- HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURIEAST ZONE STATE PLANE.
- VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

SEE PLATE NO. 7





SEE PLATE NO. 7



GAGE RECORD

ST. LOUIS, MO	L&D 27 LOWER	CHAIN OF ROCKS (LOWER)
ZERO NGVD	350.00	333.91
MILE	179.6	184.1
LWRP 2014	376.74	376.74
04 FEB 2016	15.408(20) 16.817(20)	14.378(20) 16.817(20)

SEE PLATE NO. 9

Surveyed by: BOWEN ENGINEERING	Survey Date: FEBRUARY 4, 2016	Drawn by: X	Reviewed by: X	Cad by: X
SUBMITTED: X	APPROVED: X	Plot date: _____		
U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI				
UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER				

FEBRUARY 4, 2016  
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 17:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 17:00
183	396.11	396.55	376.74	19.37	19.81
183.3	396.19	396.63	376.74	19.45	19.89
184	396.37	396.82	376.74	19.63	20.08
185	397.21	397.65	377.86	19.35	19.79
186	398.05	398.49	379.10	18.95	19.39
187	398.89	399.32	380.43	18.46	18.89

WSE CALCULATIONS COMPLETED BY TRANSFERRING L&D 27 LOWER GAGE READING TO MILE 184.0

- SOUNDED FEBRUARY 4, 2016 BY BOWEN ENGINEERING AND SURVEYING.
- HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27), COORDINATES SHOWN ARE MISSOURI EAST ZONE STATE PLANE.
- VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

