



US Army Corps of Engineers
St. Louis District

CAGE RECORD	RED ROCK LANDING, MO	BISHOPS LANDING, MO	CHESTER I L	BRUCEY'S LANDING, MO
ZERO N.G.V.D.	328.92	334.11	341.05	357.78
MILE	94.1	100.8	109.9	116.0
LWRP 2014	331.05	335.56	340.65	354.19
06 OCT 2015	Y	Y	Y	Y
03 DEC 2015	33.59/9.00 33.11/13.30	UNRECORDED	UNRECORDED	28.33/9.00 28.38/13.30 28.81/13.30

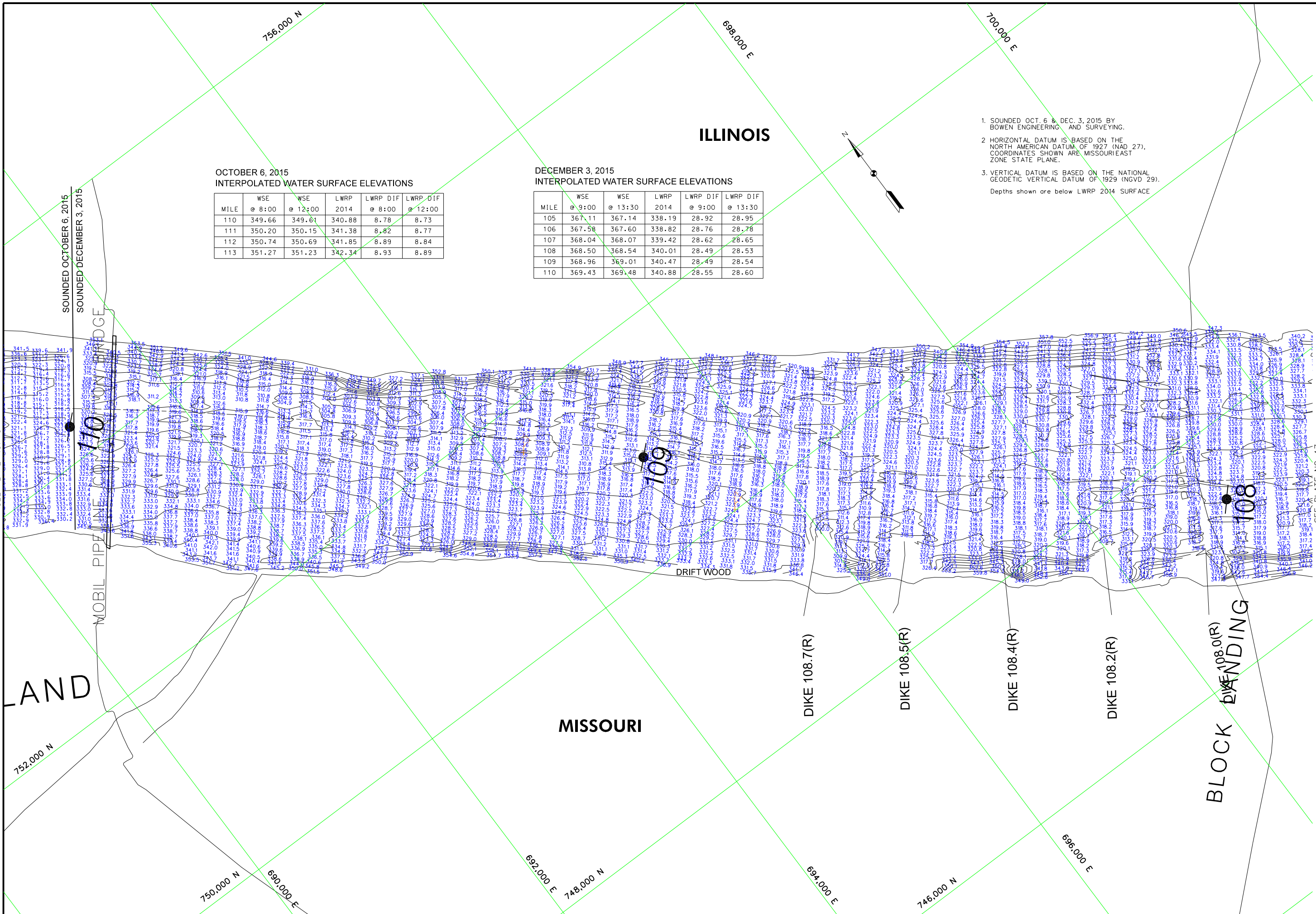
Surveyed by:	BOWEN ENGINEERING	Survey Dates:	OCT 6 & DEC 3, 2015
Drawn by:	X	Reviewed by:	X
Submitted:	X	Approved:	X
Plot date:	10/16/15	File name:	mississippi_river.dwg

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

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER

HYDROGRAPHIC SURVEYS
RIVER MILES 108.0 - 110.0

PLATE NUMBER
46



OCTOBER 6, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 12:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 12:00
110	349.66	349.61	340.88	8.78	8.73
111	350.20	350.15	341.38	8.82	8.77
112	350.74	350.69	341.85	8.89	8.84
113	351.27	351.23	342.34	8.93	8.89

DECEMBER 3, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 13:30	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 13:30
105	367.11	367.14	338.19	28.92	28.95
106	367.58	367.60	338.82	28.76	28.78
107	368.04	368.07	339.42	28.62	28.65
108	368.50	368.54	340.01	28.49	28.53
109	368.96	369.01	340.47	28.49	28.54
110	369.43	369.48	340.88	28.55	28.60

1. SOUNDED OCT. 6 & DEC. 3, 2015 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).
Depths shown are below LWRP 2014 SURFACE

SEE PLATE NO. 45

SEE PLATE NO. 47

LAND

MISSOURI

ILLINOIS

DRIFT WOOD

DIKE 108.7(R)

DIKE 108.5(R)

DIKE 108.4(R)

DIKE 108.2(R)

BLOCK BENDING

750,000 N
690,000 E

692,000 E
748,000 N

694,000 E

746,000 N

696,000 E

756,000 N

688,000 E

700,000 E

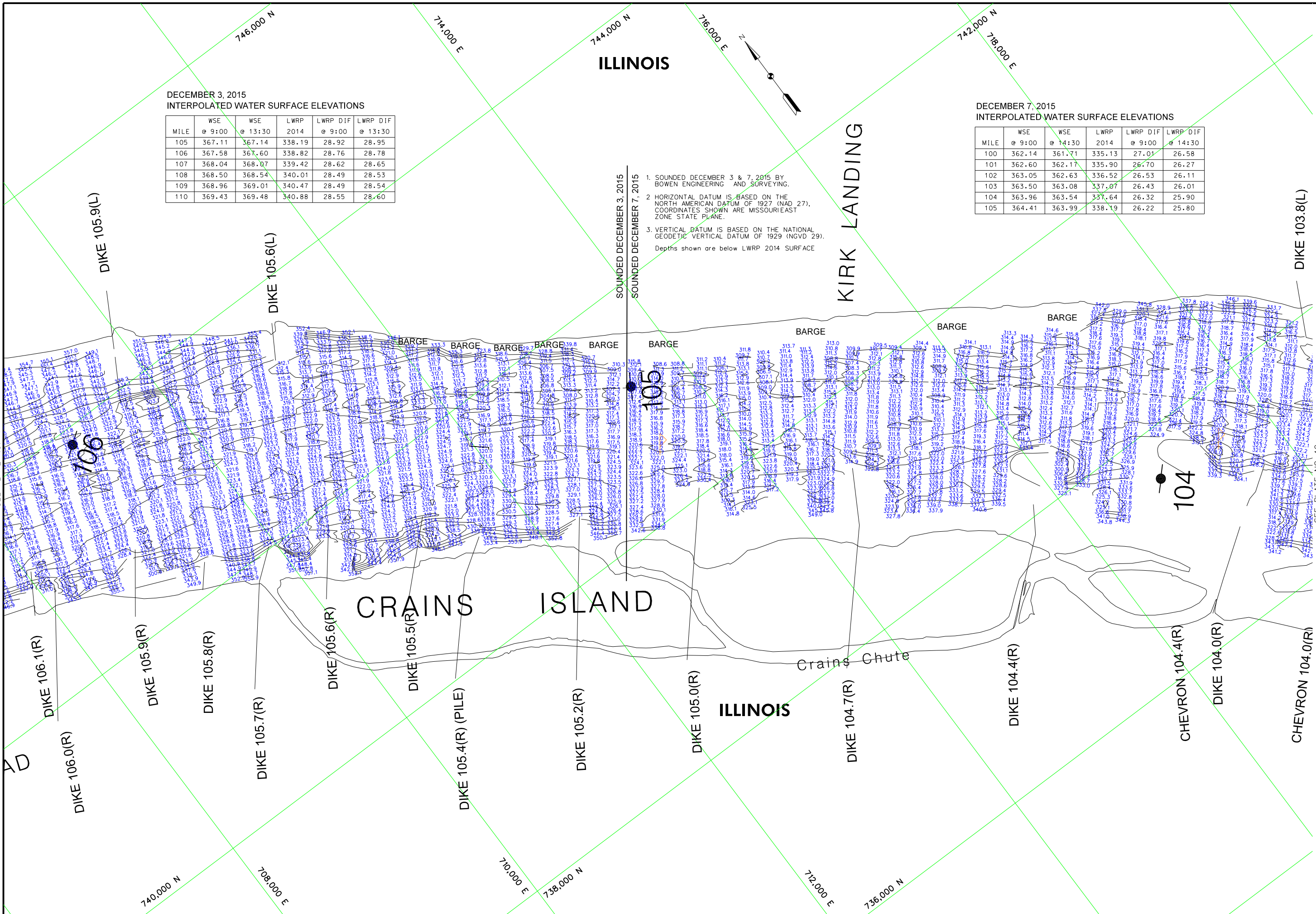
DECEMBER 3, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 13:30	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 13:30
105	367.11	367.14	338.19	28.92	28.95
106	367.58	367.60	338.82	28.76	28.78
107	368.04	368.07	339.42	28.62	28.65
108	368.50	368.54	340.01	28.49	28.53
109	368.96	369.01	340.47	28.49	28.54
110	369.43	369.48	340.88	28.55	28.60

DECEMBER 7, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 14:30	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 14:30
100	362.14	361.71	335.13	27.01	26.58
101	362.60	362.17	335.90	26.70	26.27
102	363.05	362.63	336.52	26.53	26.11
103	363.50	363.08	337.07	26.43	26.01
104	363.96	363.54	337.64	26.32	25.90
105	364.41	363.99	338.19	26.22	25.80

- SOUNDED DECEMBER 3, 2015
SOUNDED DECEMBER 7, 2015
1. SOUNDED DECEMBER 3 & 7, 2015 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).
Depths shown are below LWRP 2014 SURFACE



GAGE RECORD

RED ROCK LANDING, MO	BISHOPS LANDING, MO	CHESTER L	BRUCE'S LANDING, MO
328.92	334.31	341.05	357.78
94.1	100.8	109.9	116.0
331.05	335.56	340.65	354.19
31.58(00) 31.11(13)00	UNRECORDED	28.13(00) 28.81(13)00	25.81(00) 25.81(13)00
07 DEC 2015	30.55(99)00 30.18(14)00	UNRECORDED	25.38(99)00 25.81(13)00

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

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER

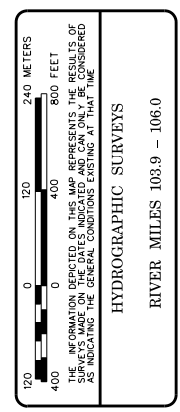
Hydrographic Surveys
RIVER MILES 103.9 - 106.0

Survey Date: DECEMBER 3 & 7, 2015

Drawn by: Bowen Engineering
Checked by: Bowen Engineering
Reviewed by: Bowen Engineering

Submitted: Bowen Engineering
Approved: Bowen Engineering

Plot Date: 12/15/2015
File Name: 151215R1039-1060.dwg





US Army Corps of Engineers
St. Louis District

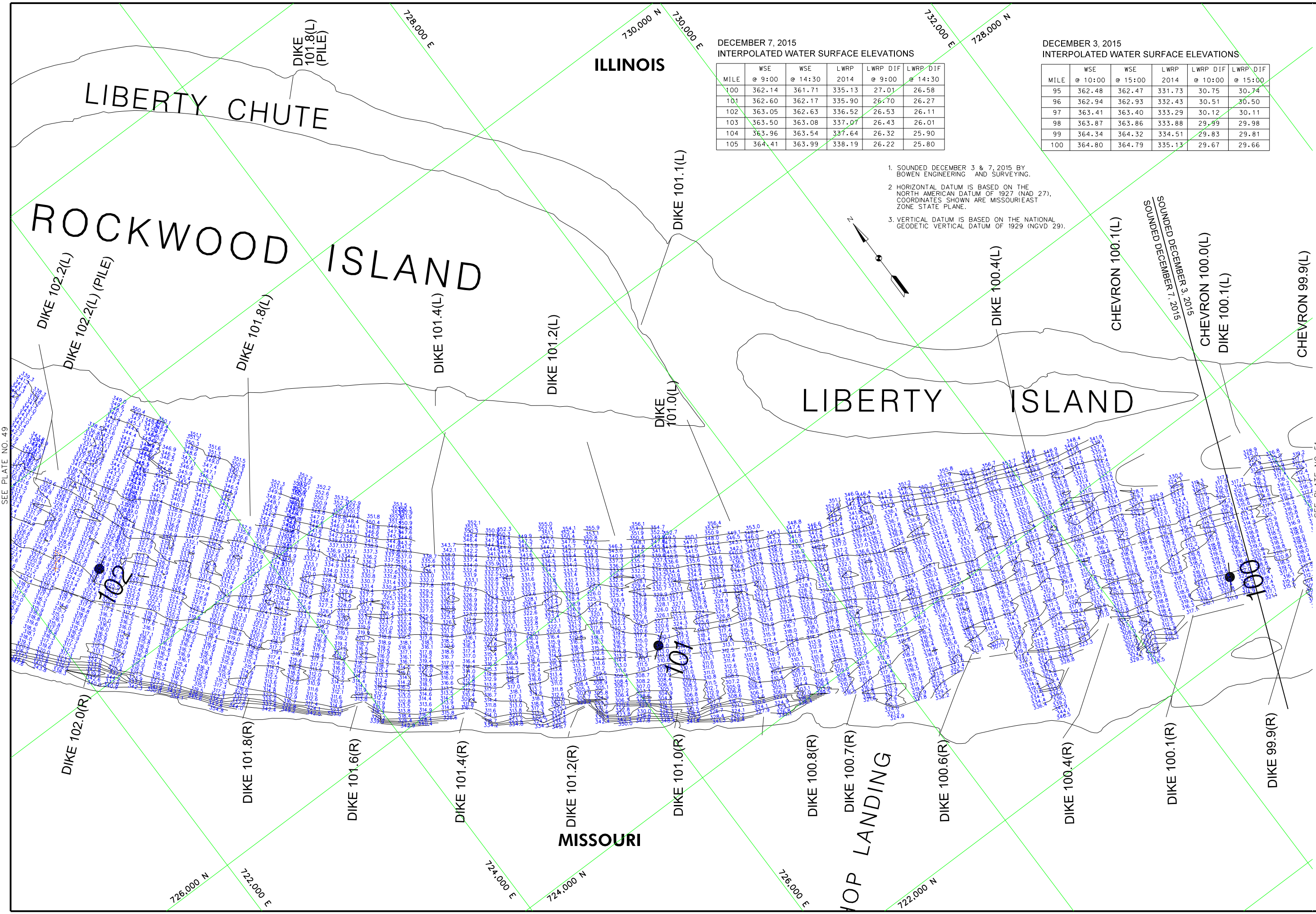
DECEMBER 7, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 14:30	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 14:30
100	362.14	361.71	335.13	27.01	26.58
101	362.60	362.17	335.90	26.70	26.27
102	363.05	362.63	336.52	26.53	26.11
103	363.50	363.08	337.07	26.43	26.01
104	363.96	363.54	337.64	26.32	25.90
105	364.41	363.99	338.19	26.22	25.80

DECEMBER 3, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 15:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 15:00
95	362.48	362.47	331.73	30.75	30.74
96	362.94	362.93	332.43	30.51	30.50
97	363.41	363.40	333.29	30.12	30.11
98	363.87	363.86	333.88	29.99	29.98
99	364.34	364.32	334.51	29.83	29.81
100	364.80	364.79	335.13	29.67	29.66

1. SOUNDED DECEMBER 3 & 7, 2015 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

RED ROCK LANDING, MO	BISHOPS LANDING, MO	CHESTER L	BRUCE'S LANDING, MO
ZERO N.G.V.D.	328.92	341.05	357.78
MILE	94.1	100.8	106.0
LWRP 2014	331.05	335.56	340.65
03 DEC 2015 13:14:00 (11 JUL 20)	UNRECORDED	UNRECORDED	UNRECORDED
07 DEC 2015 10:55:00 (30 JUN 20)	UNRECORDED	UNRECORDED	UNRECORDED

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

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER

Hydrographic Surveys
RIVER MILES 100.0 - 102.0

Survey Data
DECEMBER 3 & 7, 2015

Drawn by:	Checked by:	Reviewed by:
Submitted:	Approved:	

Plot date: 11/18/15
File name: 151215001.dwg

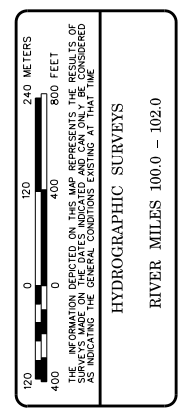


PLATE NUMBER
50

SEE PLATE NO. 49

SEE PLATE NO. 51



US Army Corps of Engineers
St. Louis District

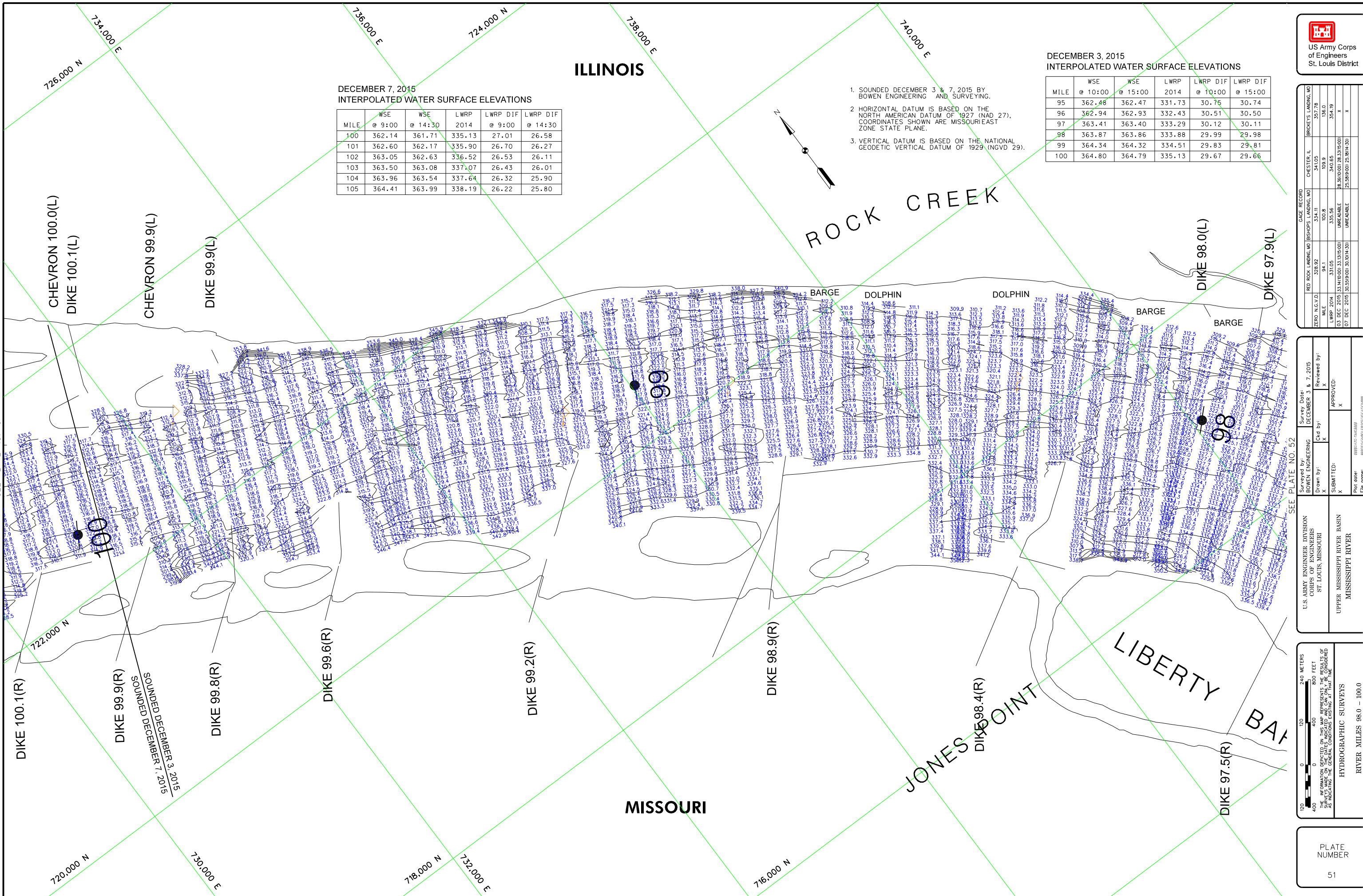
DECEMBER 3, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 15:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 15:00
95	362.48	362.47	331.73	30.75	30.74
96	362.94	362.93	332.43	30.51	30.50
97	363.41	363.40	333.29	30.12	30.11
98	363.87	363.86	333.88	29.99	29.98
99	364.34	364.32	334.51	29.83	29.81
100	364.80	364.79	335.13	29.67	29.66

DECEMBER 7, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 14:30	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 14:30
100	362.14	361.71	335.13	27.01	26.58
101	362.60	362.17	335.90	26.70	26.27
102	363.05	362.63	336.52	26.53	26.11
103	363.50	363.08	337.07	26.43	26.01
104	363.96	363.54	337.64	26.32	25.90
105	364.41	363.99	338.19	26.22	25.80

1. SOUNDED DECEMBER 3 & 7, 2015 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. 49

SEE PLATE NO. 52

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER	Survey Date: DECEMBER 3 & 7, 2015	Reviewed by: X
Drawn by: X	Submitted: X	Checked by: X	Approved: X
HYDROGRAPHIC SURVEYS		Plot Date: 12/03/2015	File Name: 151203001.dwg

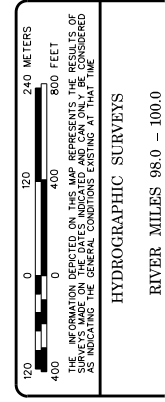


PLATE NUMBER
51



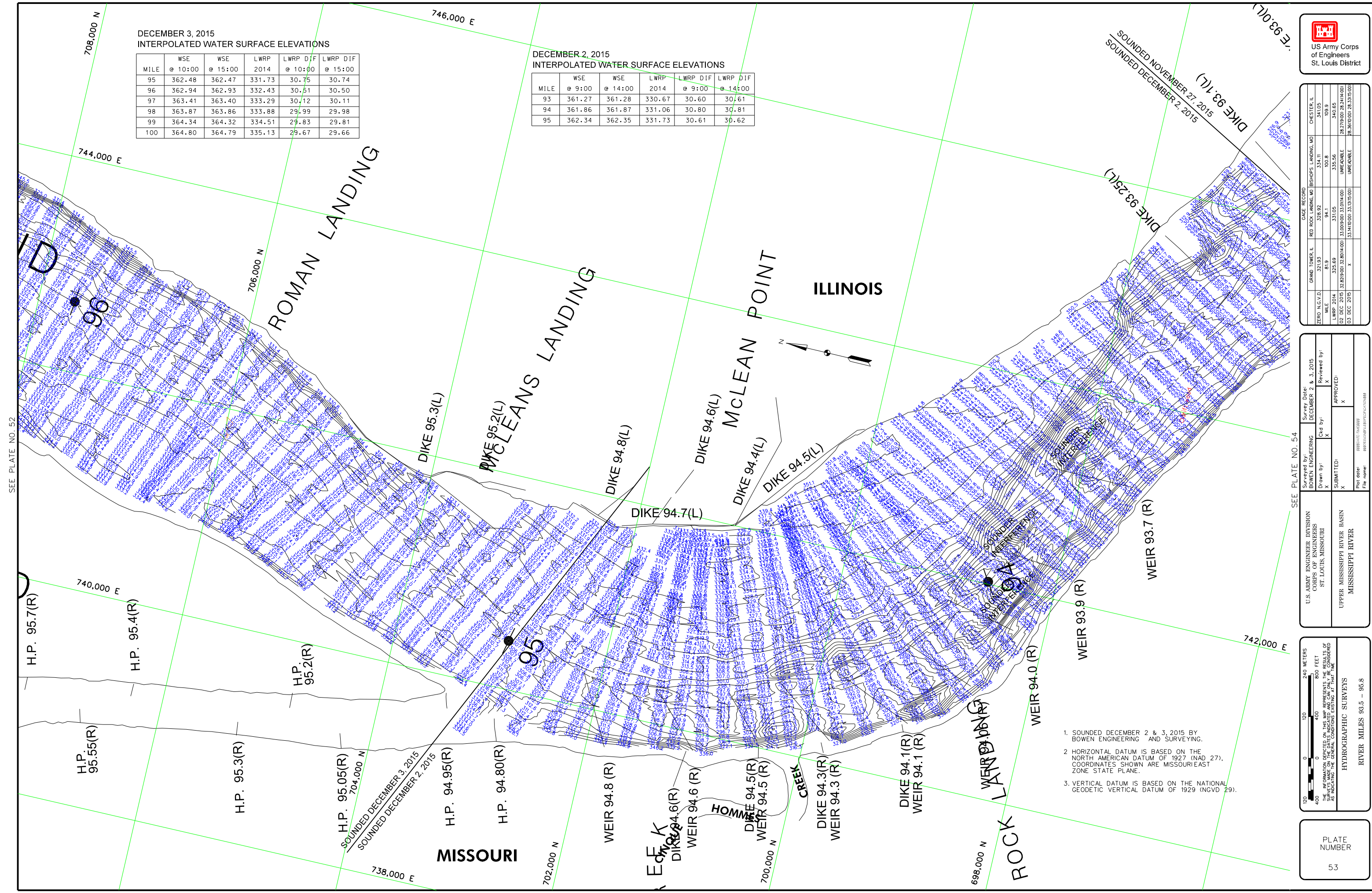
US Army Corps of Engineers
St. Louis District

DECEMBER 3, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 10:00	WSE @ 15:00	LWRP 2014	LWRP DIF @ 10:00	LWRP DIF @ 15:00
95	362.48	362.47	331.73	30.75	30.74
96	362.94	362.93	332.43	30.51	30.50
97	363.41	363.40	333.29	30.12	30.11
98	363.87	363.86	333.88	29.99	29.98
99	364.34	364.32	334.51	29.83	29.81
100	364.80	364.79	335.13	29.67	29.66

DECEMBER 2, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 14:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 14:00
93	361.27	361.28	330.67	30.60	30.61
94	361.86	361.87	331.06	30.80	30.81
95	362.34	362.35	331.73	30.61	30.62



SEE PLATE NO. 52

SEE PLATE NO. 54

CAGE RECORD	CHESTER I.L.	341.05
GRAND TOWER L	321.93	314.11
ZERO N.G.V.D.	819	100.8
MILE	94.1	100.8
LWRP 2014	325.69	331.05
02 DEC 2015	328.89(00) 32.89(14.00)	331.05(00) 31.01(14.00)
03 DEC 2015	331.16(00) 31.15(15.00)	331.16(00) 31.15(15.00)

U.S. ARMY ENGINEER DIVISION	CORPS OF ENGINEERS	ST. LOUIS, MISSOURI
UPPER MISSISSIPPI RIVER BASIN	MISSISSIPPI RIVER	
Surveyed by:	BOWEN ENGINEERING	Survey Dates: DECEMBER 2 & 3, 2015
Drawn by:	X	Reviewed by:
Submitted:	X	APPROVED:
Plot date:	12/03/15	File name:

170 0 100 240 METERS
400 0 800 FEET

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS CONDUCTED UNDER THE GENERAL CONDITIONS LISTED AT THE END OF THIS REPORT.

HYDROGRAPHIC SURVEYS
RIVER MILES 93.5 - 95.8

1. SOUNDED DECEMBER 2 & 3, 2015 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).

PLATE NUMBER
53



US Army Corps of Engineers
St. Louis District

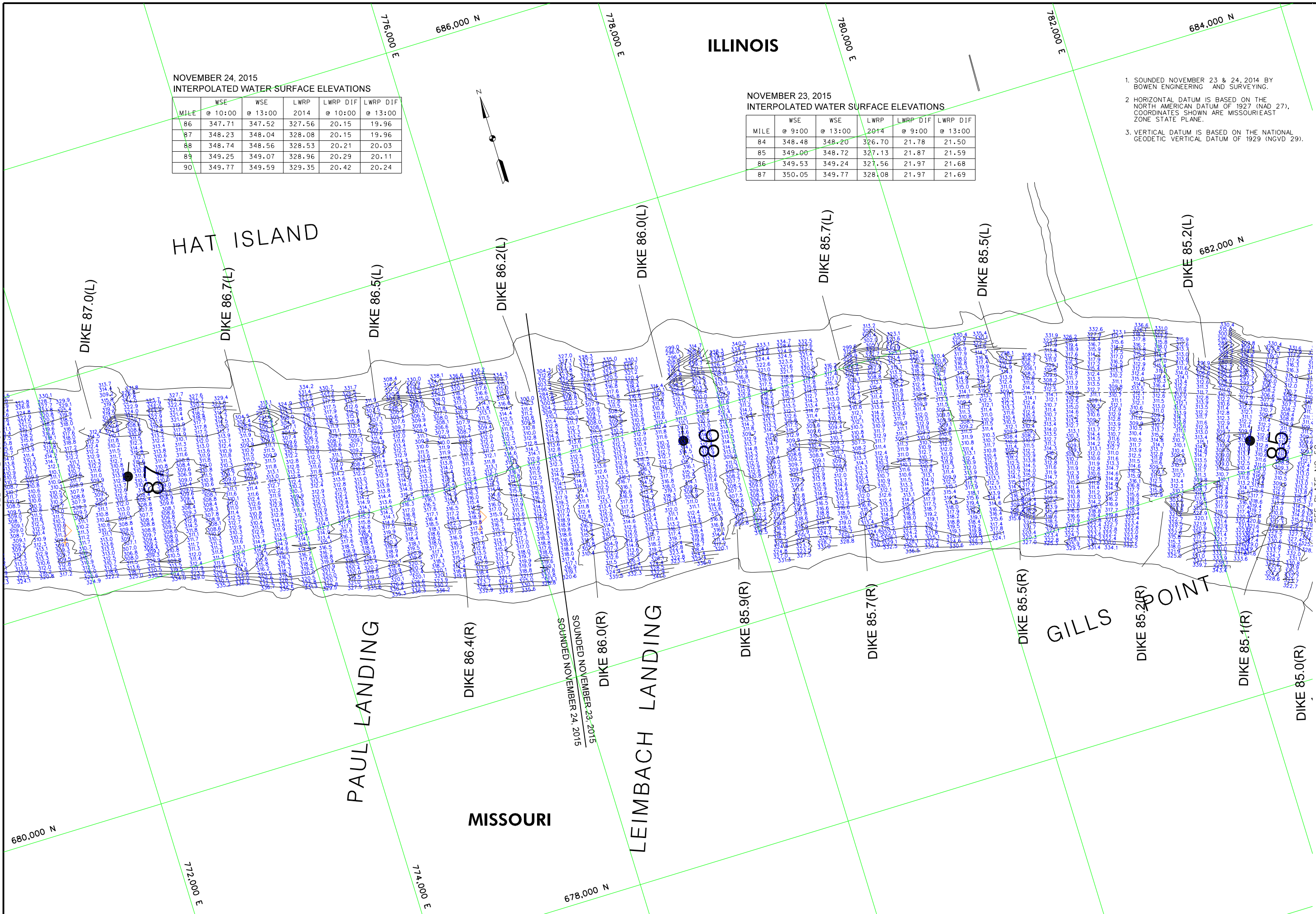
NOVEMBER 24, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE		LWRP 2014	LWRP DIF	
	@ 10:00	@ 13:00		@ 10:00	@ 13:00
86	347.71	347.52	327.56	20.15	19.96
87	348.23	348.04	328.08	20.15	19.96
88	348.74	348.56	328.53	20.21	20.03
89	349.25	349.07	328.96	20.29	20.11
90	349.77	349.59	329.35	20.42	20.24

NOVEMBER 23, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE		LWRP 2014	LWRP DIF	
	@ 9:00	@ 13:00		@ 9:00	@ 13:00
84	348.48	348.20	326.70	21.78	21.50
85	349.00	348.72	327.13	21.87	21.59
86	349.53	349.24	327.56	21.97	21.68
87	350.05	349.77	328.08	21.97	21.69

1. SOUNDED NOVEMBER 23 & 24, 2014 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).



MILE	WSE	LWRP	LWRP DIF	CASE RECORD	
				GRAND TOWER L	RED ROCK LANDINGS, MO
86.3	347.5	327.5	20.0	328.92	334.11
87.5	348.5	328.5	20.0	329.11	335.55
88.5	349.5	329.5	20.0	329.30	337.00
89.5	350.5	330.5	20.0	329.49	338.45

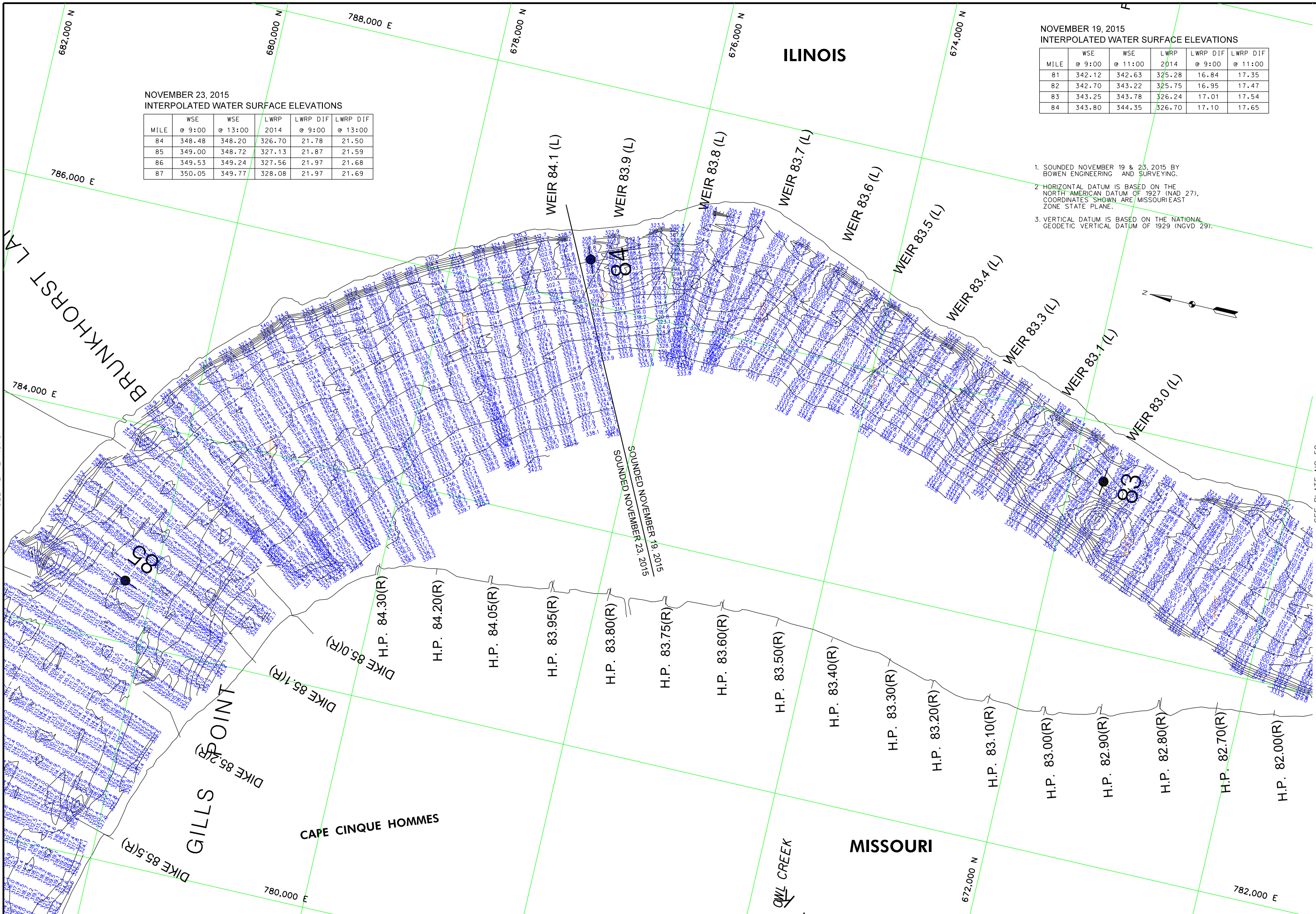
DATE	BY	REVIEWED BY	APPROVED:	
			DATE	NAME
NOV 23 2015	BOWEN ENGINEERING	NOVEMBER 23 & 24, 2015	X	
NOV 24 2015	BOWEN ENGINEERING	NOVEMBER 23 & 24, 2015	X	

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

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER

HYDROGRAPHIC SURVEYS
RIVER MILES 85.0 - 87.1

SEE PLATE NO. 57



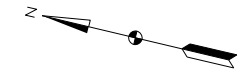
NOVEMBER 23, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 13:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 13:00
84	348.48	348.20	326.70	21.78	21.50
85	349.00	348.72	327.13	21.87	21.59
86	349.53	349.24	327.56	21.97	21.68
87	350.05	349.77	328.08	21.97	21.69

NOVEMBER 19, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 11:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 11:00
81	342.12	342.63	325.28	16.84	17.35
82	342.70	343.22	325.75	16.95	17.47
83	343.25	343.78	326.24	17.01	17.54
84	343.80	344.35	326.70	17.10	17.65

1. SOUNDED NOVEMBER 19 & 23, 2015 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).



US Army Corps of Engineers
St. Louis District

CAGE RECORD	CAPE GRANDE MO	WISSISSIPPI MO	GRAND TOWER L	RED ROCK LAUNING MO
ZERO N.G.V.D.	304.65	313.89	321.93	328.92
MILE	52.1	66.3	81.9	94.1
LWRP 2014	330.01	337.54	335.69	331.05
19 NOV 2015	X	X	X	X
23 NOV 2015	X	X	X	X

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	Survey Date: NOVEMBER 19 & 23, 2015
UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER	Drawn by: X
	Checked by: X
	Reviewed by: X
	APPROVED: X
	Plot date: 11/19/15
	File name: 15111900124185900241859002

170 0 100 240 METERS
400 0 400 800 FEET

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS CONDUCTED BY THE U.S. ARMY CORPS OF ENGINEERS AS INDICATED BY THE GENERAL CONDITIONS APPLICABLE TO THE PROJECT.

HYDROGRAPHIC SURVEYS
RIVER MILES 82.7 - 85.0

PLATE NUMBER
58

SEE PLATE NO. 59

SOUNDED NOVEMBER 19, 2015
SOUNDED NOVEMBER 23, 2015

BRUNNKHORST LA

GILLS POINT
DIKE 85.2(R)
DIKE 85.1(R)
DIKE 85.5(R)

CAPE CINQUE HOMMES

OWL CREEK

ILINOIS

MISSOURI

WEIR 84.1 (L)

WEIR 83.9 (L)

WEIR 83.8 (L)

WEIR 83.7 (L)

WEIR 83.6 (L)

WEIR 83.5 (L)

WEIR 83.4 (L)

WEIR 83.3 (L)

WEIR 83.1 (L)

WEIR 83.0 (L)

85

84

83

DIKE 85.0(R)
H.P. 84.30(R)

H.P. 84.20(R)

H.P. 84.05(R)

H.P. 83.95(R)

H.P. 83.80(R)

H.P. 83.75(R)

H.P. 83.60(R)

H.P. 83.50(R)

H.P. 83.40(R)

H.P. 83.30(R)

H.P. 83.20(R)

H.P. 83.10(R)

H.P. 83.00(R)

H.P. 82.90(R)

H.P. 82.80(R)

H.P. 82.70(R)

H.P. 82.00(R)

NOVEMBER 19, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE		LWRP 2014	LWRP DIF	
	@ 9:00	@ 11:00		@ 9:00	@ 11:00
81	342.12	342.63	325.28	16.84	17.35
82	342.70	343.22	325.75	16.95	17.47
83	343.25	343.78	326.24	17.01	17.54
84	343.80	344.35	326.70	17.10	17.65

NOVEMBER 18, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE		LWRP 2014	LWRP DIF	
	@ 9:00	@ 14:00		@ 9:00	@ 14:00
77	335.25	336.22	323.33	11.92	12.89
78	335.82	336.79	323.68	12.14	13.11
79	336.38	337.36	324.40	11.98	12.96
80	336.95	337.93	324.86	12.09	13.07
81	337.52	338.50	325.28	12.24	13.22
82	338.08	339.07	325.75	12.33	13.32

ILLINOIS



CHEVRON 81.9(L)

DIKE 81.85(L)

DIKE 81.8 (L)

LINE CO. 3-20"

SOUNDED NOVEMBER 19, 2015
SOUNDED NOVEMBER 18, 2015

TUCKER POINT

NATURAL GAS PIPELINE 30" ON BRIDGE

MISSOURI

788,000 E

786,000 E

784,000 E

782,000 E

670,000 N

668,000 N

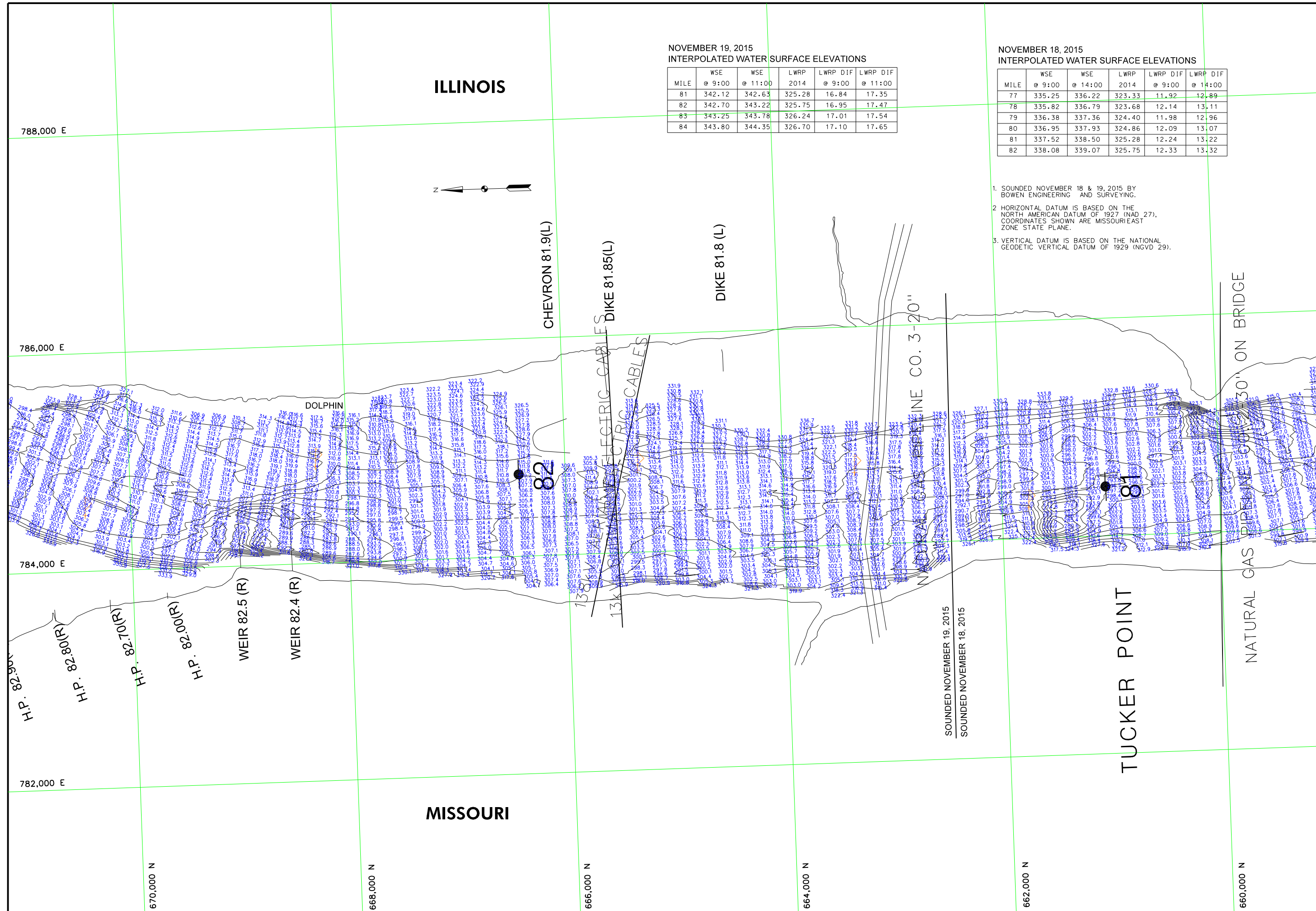
666,000 N

664,000 N

662,000 N

660,000 N

1. SOUNDED NOVEMBER 18 & 19, 2015 BY BOWEN ENGINEERING AND SURVEYING.
2. HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURIEAST ZONE STATE PLANE.
3. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).



CAGE RECORD

ZERO N.G.V.D.	CAPE GRANDE/AL MO	MCCECIN SPRINGS/AL MO	GRAND TOWER L	RED ROCK LAUNING/AL MO
MILE 2014	52.1	30.01	33.89	32.92
18 NOV 2015	X	X	66.3	94.1
19 NOV 2015	X	X	317.54	331.05
			15.298(00) E(2014/00)	15.149(00) E(2014/00)
			20.272(00) T(23/00)	20.419(00) E(14/00)

SEE PLATE NO. 60

Survey Date	Surveyed by	Drawn by	Checked by	Reviewed by
NOVEMBER 18 & 19, 2015	BOWEN ENGINEERING	X	X	X

APPROVED:

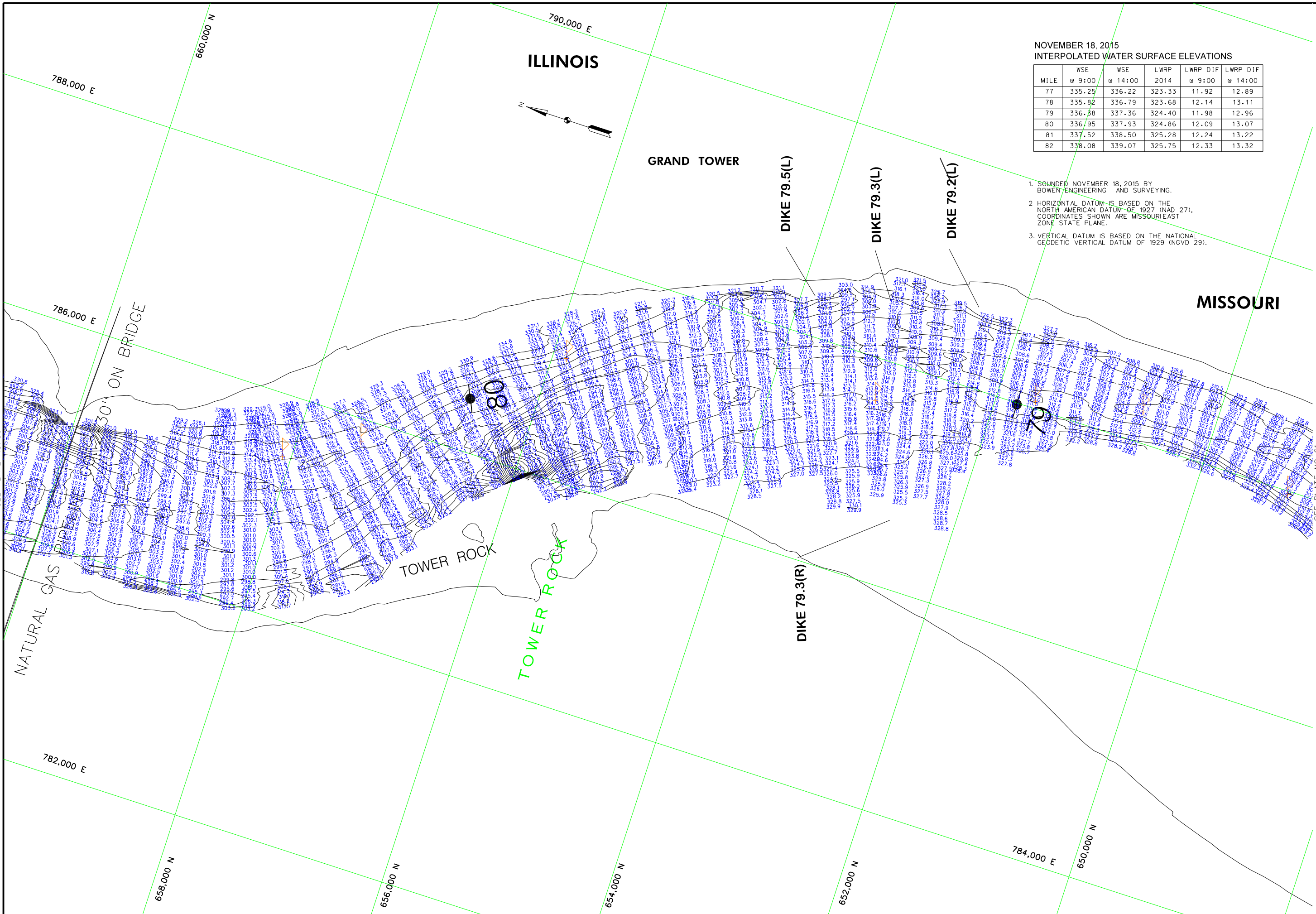
Plot Code: MISSOURI/ILLINOIS

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

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER

HYDROGRAPHIC SURVEYS

RIVER MILES 80.7 - 82.7



NOVEMBER 18, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

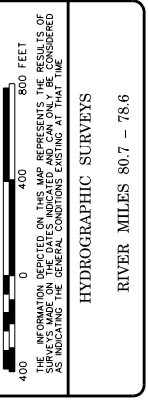
MILE	WSE @ 9:00	WSE @ 14:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 14:00
77	335.25	336.22	323.33	11.92	12.89
78	335.82	336.79	323.68	12.14	13.11
79	336.38	337.36	324.40	11.98	12.96
80	336.95	337.93	324.86	12.09	13.07
81	337.52	338.50	325.28	12.24	13.22
82	338.08	339.07	325.75	12.33	13.32

1. SOUNDED NOVEMBER 18, 2015 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).



CAGE RECORD	CAPE GRANDE, MO	WCCSSIN, MO	GRAND TOWER, L	RED ROCK LANDING, MO
ZERO N.G.V.D.	304.65	313.89	321.93	328.92
MILE	52.1	66.3	81.9	94.1
LWRP 2014	330.01	337.54	335.69	331.05
18 NOV 2015	X	X	X	X

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	Survey Date: NOVEMBER 18, 2015	Reviewed by: X
UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER	Drawn by: X	APPROVED: X
	Submitted: X	Plot date: 11/18/2015
	File name: 11/18/2015/11/18/2015/11/18/2015	



HYDROGRAPHIC SURVEYS
RIVER MILES 80.7 - 78.6
PLATE NUMBER
60



US Army Corps of Engineers
St. Louis District

MISSOURI

GRAND TOWER ISLAND

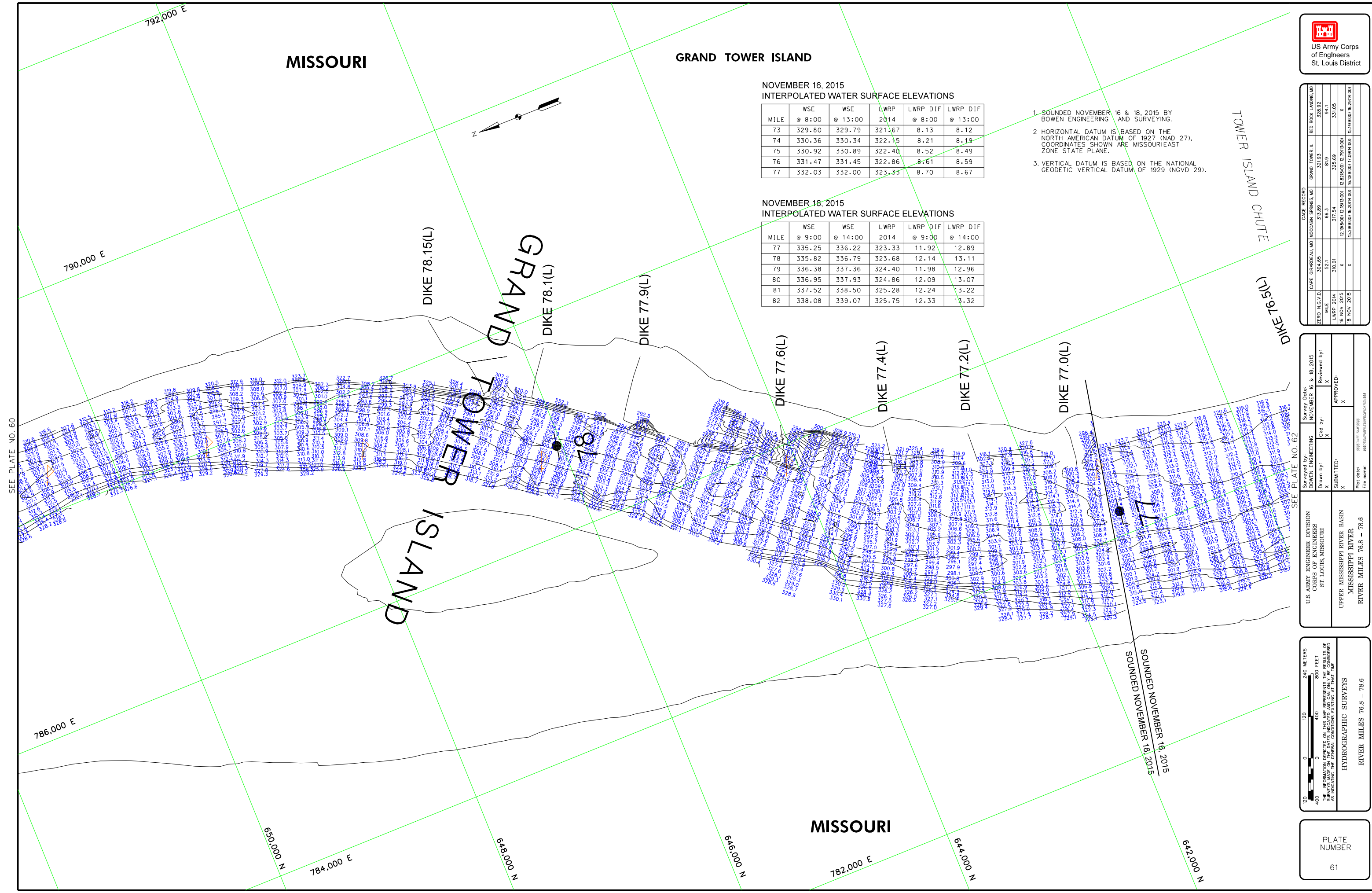
NOVEMBER 16, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE		LWRP 2014	LWRP DIF	
	@ 8:00	@ 13:00		@ 8:00	@ 13:00
73	329.80	329.79	321.67	8.13	8.12
74	330.36	330.34	322.15	8.21	8.19
75	330.92	330.89	322.40	8.52	8.49
76	331.47	331.45	322.86	8.61	8.59
77	332.03	332.00	323.33	8.70	8.67

1. SOUNDED NOVEMBER 16 & 18, 2015 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).

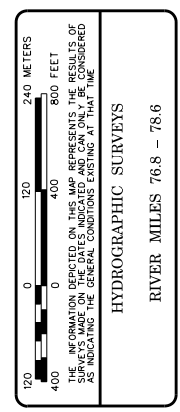
NOVEMBER 18, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE		LWRP 2014	LWRP DIF	
	@ 9:00	@ 14:00		@ 9:00	@ 14:00
77	335.25	336.22	323.33	11.92	12.89
78	335.82	336.79	323.68	12.14	13.11
79	336.38	337.36	324.40	11.98	12.96
80	336.95	337.93	324.86	12.09	13.07
81	337.52	338.50	325.28	12.24	13.22
82	338.08	339.07	325.75	12.33	13.32



CAPE RECORD		RED ROCK LAKE, MO	
CAPE GRANDE, MO	WCCCSN SPRINGS, MO	GRAND TOWER, L	RED ROCK LAKE, MO
304.65	313.89	321.93	328.92
52.1	66.3	81.9	94.1
30.01	37.54	325.69	331.05
X	X	X	X
15 NOV 2015	12.18.00 (E 7811300)	12.18.00 (E 7811300)	15.14.00 (E 291400)
18 NOV 2015	X	X	X
X	X	X	X

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI	Survey Date: NOVEMBER 16 & 18, 2015	Drawn by: X	Reviewed by: X
UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER RIVER MILES 76.8 - 78.6	Submitted: X	Approved: X	File name: #8801616.mxd



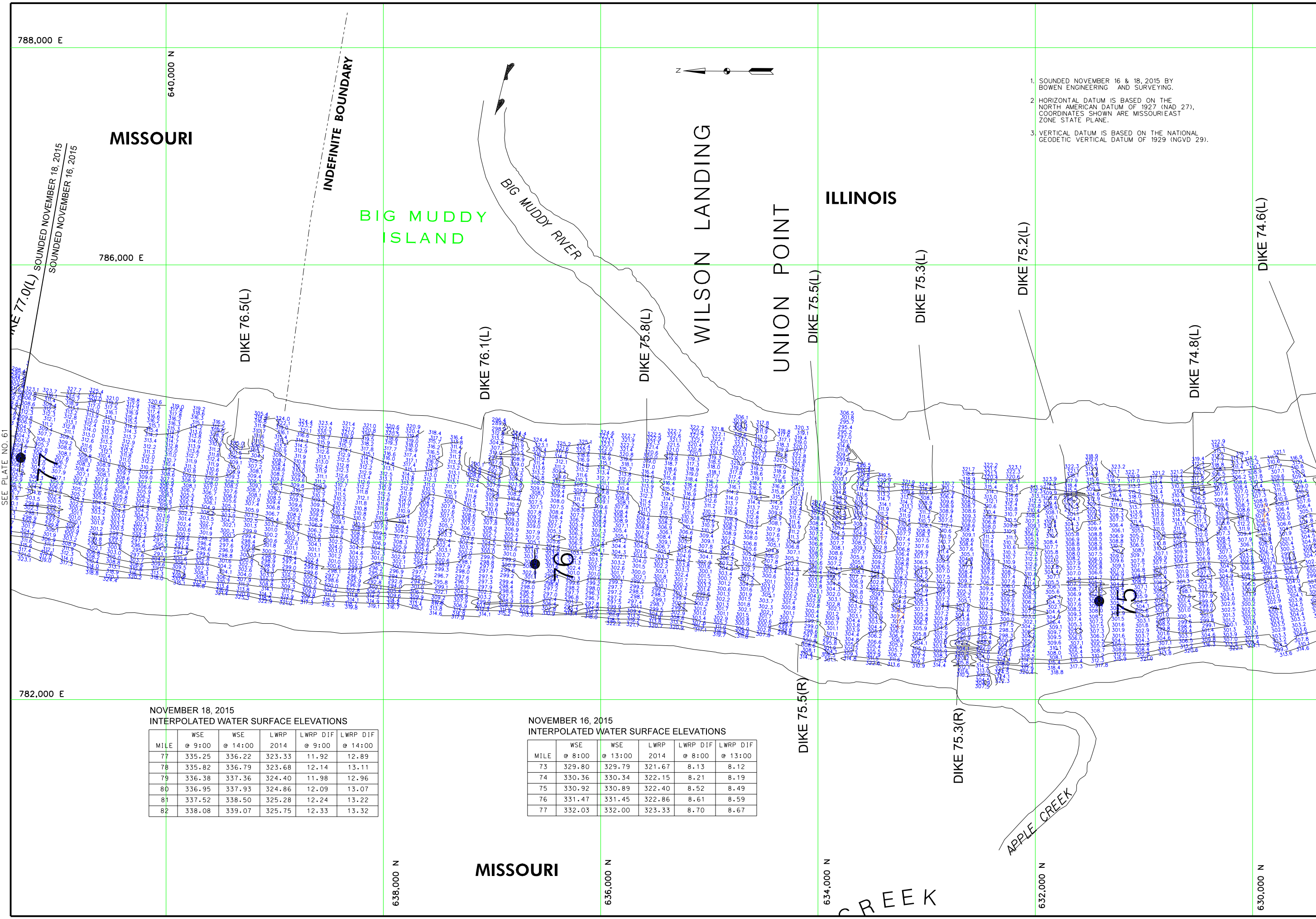
1. SOUNDED NOVEMBER 16 & 18, 2015 BY BOWEN ENGINEERING AND SURVEYING.
2. HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1927 (NAD 27). COORDINATES SHOWN ARE MISSOURI EAST ZONE STATE PLANE.
3. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

CAGE RECORD		CAPE GRANDE, MO		WILSON SPRINGS, MO		RED ROCK LANDING, MO	
ZERO N.G.V.D.	CAPE GRANDE, MO	WILSON SPRINGS, MO	CAPE GRANDE, MO	WILSON SPRINGS, MO	RED ROCK LANDING, MO	CAPE GRANDE, MO	WILSON SPRINGS, MO
304.65	304.65	304.65	304.65	304.65	304.65	304.65	304.65
52.1	52.1	52.1	52.1	52.1	52.1	52.1	52.1
30.01	30.01	30.01	30.01	30.01	30.01	30.01	30.01
X	X	X	X	X	X	X	X
15 NOV 2014	15 NOV 2014	15 NOV 2014	15 NOV 2014	15 NOV 2014	15 NOV 2014	15 NOV 2014	15 NOV 2014
18 NOV 2015	18 NOV 2015	18 NOV 2015	18 NOV 2015	18 NOV 2015	18 NOV 2015	18 NOV 2015	18 NOV 2015

U.S. ARMY ENGINEER DIVISION		CORPS OF ENGINEERS		ST. LOUIS, MISSOURI	
Drawn by:	Checked by:	Reviewed by:	Submitted:	Approved:	Plot date:
X	X	X	X	X	X
UPPER MISSISSIPPI RIVER BASIN					
MISSISSIPPI RIVER					

U.S. ARMY ENGINEER DIVISION		CORPS OF ENGINEERS		ST. LOUIS, MISSOURI	
Drawn by:	Checked by:	Reviewed by:	Submitted:	Approved:	Plot date:
X	X	X	X	X	X
UPPER MISSISSIPPI RIVER BASIN					
MISSISSIPPI RIVER					

HYDROGRAPHIC SURVEYS	
RIVER MILES	74.7 - 76.8
170	0
400	0
800	0
1200	0



NOVEMBER 18, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 14:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 14:00
77	335.25	336.22	323.33	11.92	12.89
78	335.82	336.79	323.68	12.14	13.11
79	336.38	337.36	324.40	11.98	12.96
80	336.95	337.93	324.86	12.09	13.07
81	337.52	338.50	325.28	12.24	13.22
82	338.08	339.07	325.75	12.33	13.32

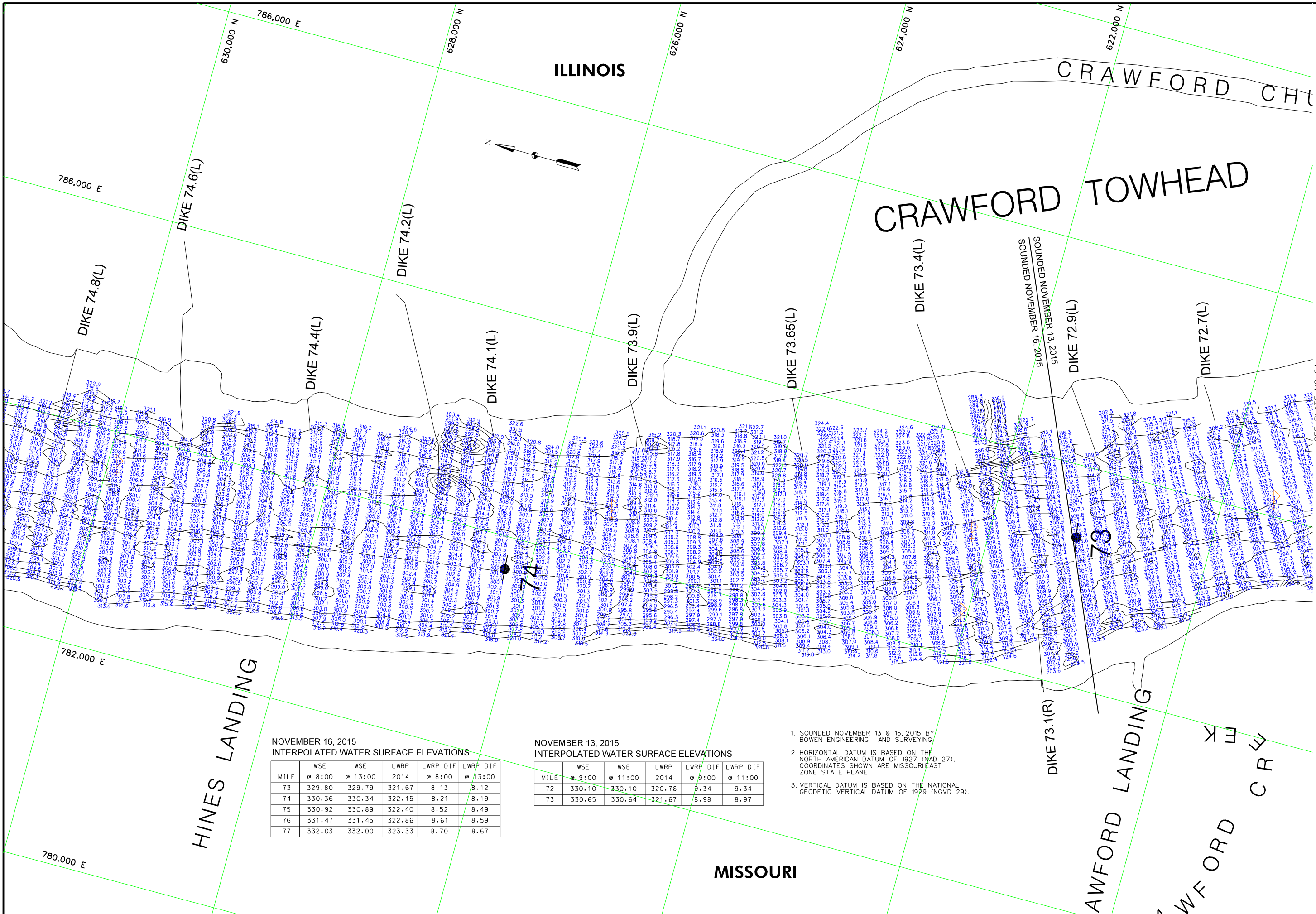
NOVEMBER 16, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 13:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 13:00
73	329.80	329.79	321.67	8.13	8.12
74	330.36	330.34	322.15	8.21	8.19
75	330.92	330.89	322.40	8.52	8.49
76	331.47	331.45	322.86	8.61	8.59
77	332.03	332.00	323.33	8.70	8.67

CAGE RECORD		CAPE GARDEAU, MO		WECHESSA SPRINGS, MO		GRAND TOWER, L		RED ROCK LANDING, MO	
MILE	NOV 2014	MILE	NOV 2014	MILE	NOV 2014	MILE	NOV 2014	MILE	NOV 2014
74	330.01	74	330.01	74	330.01	74	330.01	74	330.01
75	X	75	X	75	X	75	X	75	X
76	X	76	X	76	X	76	X	76	X
77	X	77	X	77	X	77	X	77	X

U.S. ARMY ENGINEER DIVISION		CORPS OF ENGINEERS		ST. LOUIS, MISSOURI		UPPER MISSISSIPPI RIVER BASIN		MISSISSIPPI RIVER	
Drawn by	Checked by	Reviewed by	Approved	Submitted	Plot Date	File Name	Revision	Date	Description
BOWEN ENGINEERING	NOVEMBER 13 & 16, 2015	NOVEMBER 13 & 16, 2015	X	X	11/16/2015	11/16/2015	1	11/16/2015	INTERPOLATED WATER SURFACE ELEVATIONS

HYDROGRAPHIC SURVEYS	
RIVER MILES	72.7 - 74.7



NOVEMBER 16, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 13:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 13:00
73	329.80	329.79	321.67	8.13	8.12
74	330.36	330.34	322.15	8.21	8.19
75	330.92	330.89	322.40	8.52	8.49
76	331.47	331.45	322.86	8.61	8.59
77	332.03	332.00	323.33	8.70	8.67

NOVEMBER 13, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 11:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 11:00
72	330.10	330.10	320.76	9.34	9.34
73	330.65	330.64	321.67	8.98	8.97

- SOUNDED NOVEMBER 13 & 16, 2015 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. 62

SEE PLATE NO. 64

ILLINOIS

MISSOURI

CRAWFORD TOWHEAD

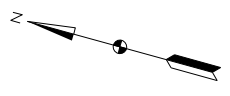
HINES LANDING

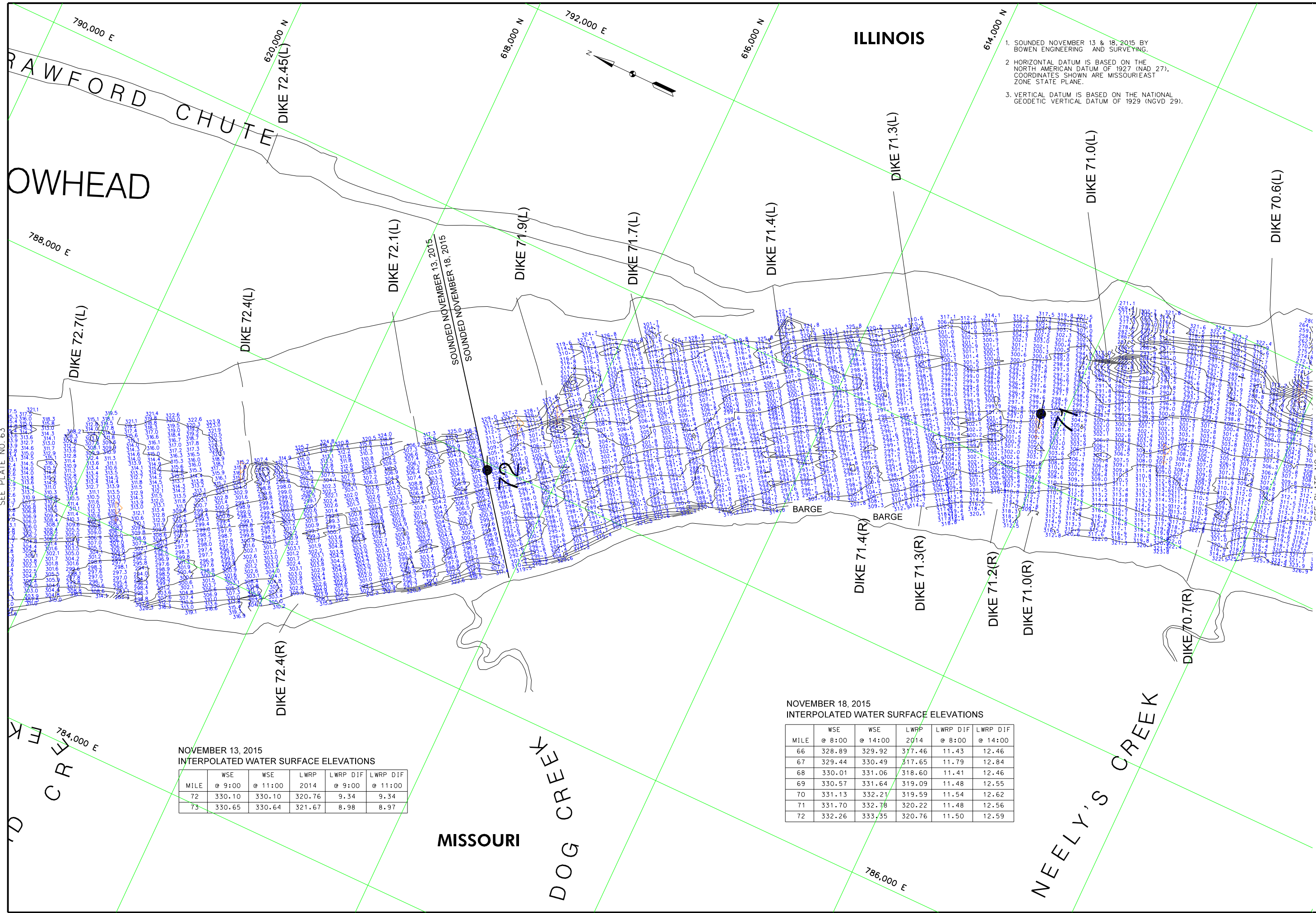
CRAWFORD LANDING

CRAWFORD LANDING

CRAWFORD CHL

SOUNDED NOVEMBER 13, 2015
SOUNDED NOVEMBER 16, 2015





NOVEMBER 13, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 9:00	WSE @ 11:00	LWRP 2014	LWRP DIF @ 9:00	LWRP DIF @ 11:00
72	330.10	330.10	320.76	9.34	9.34
73	330.65	330.64	321.67	8.98	8.97

NOVEMBER 18, 2015
INTERPOLATED WATER SURFACE ELEVATIONS

MILE	WSE @ 8:00	WSE @ 14:00	LWRP 2014	LWRP DIF @ 8:00	LWRP DIF @ 14:00
66	328.89	329.92	317.46	11.43	12.46
67	329.44	330.49	317.65	11.79	12.84
68	330.01	331.06	318.60	11.41	12.46
69	330.57	331.64	319.09	11.48	12.55
70	331.13	332.21	319.59	11.54	12.62
71	331.70	332.78	320.22	11.48	12.56
72	332.26	333.35	320.76	11.50	12.59

1. SOUNDED NOVEMBER 13 & 18, 2015 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		CAPE GARDEAU, MO		WECOSIN SPRINGS, MO		RED ROCK LAUNING, MO	
ZERO N.G.V.D.	304.65	304.65	313.89	321.93	328.92		
MILE	52.1	66.3	81.9	94.1			
LWRP 2014	330.01	337.54	335.69	331.05			
13 NOV 2015	Y	11.98(00) 11.98(00)	11.56(00) 11.54(00)	X			
18 NOV 2015	Y	16.66(00) 17.43(00)	15.91(00) 15.91(00)	X			

Survey Dates		NOVEMBER 13 & 18, 2015	
Drawn by:	X	Reviewed by:	X
Submitted:	X	Approved:	X
Plot code:	MISSOURI	File name:	MISSOURI

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

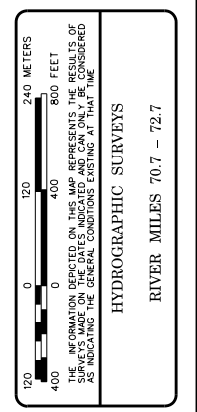


PLATE NUMBER
64