Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Dike 124.70L

Photograph 2: Dike 124.70R

Photograph 3: Dike 124.50L

Photograph 4: Dike 124.50R

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Dike 124.20L

Photograph 2: Dike 124.20R

Photograph 3: Dike 124.00L

Photograph 4: Dike 123.90L

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
St. Louis, MO Gage = 2.5 Feet LWRP

Photograph 1: Dike 123.00L (Helicopter Photo Taken September 24, 2012)

Photograph 2: Dike 122.90R

Photograph 3: Dike 122.80R

Photograph 4: Dike 122.60R

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Longitudinal Profile Stone Toe Protection (LPSTP)

Moro Chute primary entrance RM 122.70L

Chesler, IL Gage = 34.78 Foot NGS29 Elevation or 1.4 Foot LWDP

Photograph 2: Looking downstream at Pile DiKe 122.00L
Photograph 1: Looking downstream (Moro Chute entrances) at Dike 122.60L
St. Louis, MO Gage = 2.5 Feet LWRP

Photograph 2: Moro Chute primary entrance and Dike 122.60L
St. Louis, MO Gage = 2.5 Feet LWRP

Photograph 3: Dike 122.60L

Photograph 4: Pile Extension from Dike 122.60L

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Dike 122.10L

Photograph 2: Dike 121.90L

Photograph 3: Dike 121.70L

Photograph 4: Dike 121.50L

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Pile Dike X inside Moro Chute
(does not appear on the Master Plan)

Photograph 2: Looking upstream at Pile Dike X inside Moro Chute
(does not appear on the Master Plan)

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP

Photograph 3: Looking at Pile Dike X inside Moro Chute
(does not appear on the Master Plan)

Photograph 4: Looking downstream at Pile Dike 121.60L inside Moro Chute
Photograph 1: Dike 121.45R, 121.35R, 121.20R, and Revetment

Photograph 2: Dike 120.50R (Helicopter Photo take Sept. 20, 2012)
STL Gage = 2.5 feet LWRP

Photograph 3: Dike 121.00L

Photograph 4: Dike 120.70L

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Looking upstream into Moro Chute and Dike 120.20L (Helicopter Photo Taken Sept. 20, 2012)

Photograph 2: Dike 120.20L

Photograph 3: Dike 119.50L

Photograph 4: Dike 119.50R

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Dike 118.70R

Photograph 2: Dike 118.60R

Photograph 3: Dike 118.40R

Photograph 4: Dike 118.30R

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Dike 118.10R

Photograph 2: Dike 117.90R

Photograph 3: Dike 117.60R

Photograph 4: Dike 117.50R

Chester, IL Gage = 341.78 Feet NGVD29 Elevation or 1.4 Feet LWRP
Photograph 1: Kaskaskia and Mississippi River confluence (Helicopter Photo Taken Sept. 20, 2012)

Photograph 2: Dike 117.10R (Helicopter Photo Taken Sept. 20, 2012)

Photograph 3: Looking downstream at Beaver Island side channel (Helicopter Photo Taken Sept. 20, 2012)

Photograph 4: Looking upstream at Dike 116.60R and Dike 116.30R (Helicopter Photo Taken Sept. 20, 2012)

St. Louis, MO Gage = 2.5 Feet LWRP
Photograph 1: Looking downstream at Moro Chute secondary entrance

5/4/2000
Chester, IL Gage = +7.88 Feet LWRP

Photograph 2: Looking at Dike 122.60L and Moro Chute primary entrance

Photograph 3: Looking upstream at Moro Chute primary entrance

11/6/2001
Chester, IL Gage = +9.08 Feet LWRP

Photograph 4: Looking at Dike 122.60L and Moro Chute primary entrance
Photograph 1: Looking upstream at Moro Chute primary entrance

Photograph 2: Moro Chute primary entrance bankline failure

Photograph 3: Looking at the outside bend of Moro Chute primary entrance.

8/8/2001
Chester, IL Gage = +11.48 Feet LWRP

8/16/2001
Chester, IL Gage = +5.05 Feet LWRP
Photograph 1: Looking downstream at Dike 120.20L inside Moro Chute

Photograph 2: Looking upstream inside Moro Chute at Dike 121.10L

Photograph 3: Looking upstream at Dike 120.20L along the LDB

Photograph 4: Looking down at Dike 121.10L inside More Chute
Chester, IL Gage = +9.08 Feet LWRP

Photograph 1: Looking downstream at Dike 122.60L

Photograph 2: Looking downstream at Dike 122.60L

Photograph 3: Looking upstream at Pile Dike 121.60L
Photograph 1: Looking at outside bend inside Moro Chute

Morro Chute HS R Model, MDX

2012 Avoid and Minimize Program

U.S. Army Engineering Division
Corps of Engineers
St. Louis, Missouri

Middle Mississippi River Basin

Photograph 2: Looking upstream at Moro Chute

Channel L Gage = +11.86 Feet LWR
8/8/2001

Channel L Gage = +5.05 Feet LWR
7/18/2001
GEOMORPHOLOGY 1976 - 1986
2012 AERIAL PHOTOGRAPH
### Proposed Structures

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 And Above</td>
<td>10 - 0</td>
</tr>
<tr>
<td>10 - 0</td>
<td>0 - 5</td>
</tr>
<tr>
<td>0 - 5</td>
<td>0 - 10</td>
</tr>
<tr>
<td>0 - 10</td>
<td>-5 - -15</td>
</tr>
<tr>
<td>-5 - -15</td>
<td>-15 - -20</td>
</tr>
<tr>
<td>-15 - -20</td>
<td>-20 - -30</td>
</tr>
<tr>
<td>-20 - -30</td>
<td>-30 - -40</td>
</tr>
<tr>
<td>-30 - -40</td>
<td>-40 - -50</td>
</tr>
<tr>
<td>-40 - -50</td>
<td>-50 And Below</td>
</tr>
</tbody>
</table>

#### Weir

- **Moro Chute**

- **MISMOISI**

#### Dike

- **Shoote Dike 123.00L**

- **Remove Pile Dike 123.00L**

- **Construct Dike 122.60L**

- **Remove Dike 122.60L**

- **Construct Dike 122.40L**

#### Pile

- **120.20L (Notched)**

#### Replication

- **120.00L**

#### Alternative Testing

- **120.00L**

---

**Note:** The map illustrates the proposed structures, elevations, and testing alternatives for the Moro Chute project. The data provided includes specific elevations and their respective structures to be evaluated and implemented. The map is a visual representation of the proposed solutions for water management and structural improvement in the Middle Mississippi Basin.
REPLICATION TEST

ANNAPOLIS DRAINAGE BASIN

Moro Chute

MISSOURI

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

REPLICAT ION TEST

vs.

ALTERNATIVE 2

Elevation
LWRP (Feet)

- 10 And Above
- 10 - 0
- 0 - -5
- -5 - -10
- -10 - -15
- -15 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -50 And Below

Dike
Pile
Weir
Proposed Structures

Shorten Dike 110.60L
Remove Pile Dike 123.00L
Remove Dike 122.60L
Remove Pile Dike 122.60L

CONSTRUCTION:
A V O I D A N D M I N I M I Z E P R O G R A M 2012 L :
H S R M O D E L S M O R O C H U T E . M D X

NORTH AMERICAN Datum System for Vertical LEV E LS (NAVD 88)
DEPARTMENT OF DEFENSE NAVD 88

PLATE NUMBER

10

0

1,000

2,400

4,800

4" Ind

US ARMY ENGINEERING DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

DRAWN BY

A. COX

CHECKED BY

E. S. W. O. O.

DATE: 3/2014

L. W. R. M. L. T. M. 0. 0. Y. M. 0. B. Y.

MIDDLE MISSISSIPPI BASIN:
MORO CHUTE, HMA MODEL
AVOID AND MINIMIZE PROGRAM 2012

L. W. R. M. L. T. M. 0. 0. Y. M. 0. B. Y.

L. W. R. M. L. T. M. 0. 0. Y. M. 0. B. Y.

L. W. R. M. L. T. M. 0. 0. Y. M. 0. B. Y.
Elevation
LWRP (Feet)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>LWRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 And Above</td>
<td></td>
</tr>
<tr>
<td>10 - 0</td>
<td></td>
</tr>
<tr>
<td>0 - -5</td>
<td></td>
</tr>
<tr>
<td>-5 - -10</td>
<td></td>
</tr>
<tr>
<td>-10 - -15</td>
<td></td>
</tr>
<tr>
<td>-15 - -20</td>
<td></td>
</tr>
<tr>
<td>-20 - -30</td>
<td></td>
</tr>
<tr>
<td>-30 - -40</td>
<td></td>
</tr>
<tr>
<td>-40 - -50</td>
<td></td>
</tr>
<tr>
<td>-50 And Below</td>
<td></td>
</tr>
</tbody>
</table>

Proposed Structures

- Dike
- Pile
- Weir

Repliation Test vs. Alternative 3
Elevation
LWRP (Feet)

- 10 And Above
- 10 - 0
- 0 - -5
- -5 - -10
- -10 - -15
- -15 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -50 And Below
**Elevation LWRP (Feet)**

- **10 And Above**
- **10 - 0**
- **0 - -5**
- **-5 - -10**
- **-10 - -15**
- **-15 - -20**
- **-20 - -30**
- **-30 - -40**
- **-40 - -50**
- **-50 And Below**

**Proposed Structures**

- Dike
- Pile
- Weir

**Replcation Test vs. Alternative Testing**

**St. Genevieve, MO**

**U.S. Army Corps of Engineers**

- St. Louis District
- St. Louis, Missouri

**Missouri River**

**MORO CHUTE**

- **Proposed Structures**
  - Dike
  - Pile
  - Weir

**LWRP (Feet)**

- **10 And Above**
- **10 - 0**
- **0 - -5**
- **-5 - -10**
- **-10 - -15**
- **-15 - -20**
- **-20 - -30**
- **-30 - -40**
- **-40 - -50**
- **-50 And Below**

**MORO CHUTE**

- **Proposed Structures**
  - Dike
  - Pile
  - Weir

**LWRP (Feet)**

- **10 And Above**
- **10 - 0**
- **0 - -5**
- **-5 - -10**
- **-10 - -15**
- **-15 - -20**
- **-20 - -30**
- **-30 - -40**
- **-40 - -50**
- **-50 And Below**
**Elevation**

LWRP (Feet)

- **10 And Above**
- **10 - 0**
- **0 - -5**
- **-5 - -10**
- **-10 - -15**
- **-15 - -20**
- **-20 - -30**
- **-30 - -40**
- **-40 - -50**
- **-50 And Below**
REPLICATION TEST
VS.
ALTERNATIVE 10
Elevation
LWRP (Feet)
10 And Above
10 - 0
0 - -5
-5 - -10
-10 - -15
-15 - -20
-20 - -30
-30 - -40
-40 - -50
-50 And Below
Elevation
LWRP (Feet)

-10 - -5
-5 -0
0 - 10
10 - 20
20 - 30
30 - 40
40 - 50
50 And Below

Missouri

Moro Chute

Weir

Pile

Dike
**Repli**cation

**Alternative Testing**

**Elevation**

LWRP (Feet)

- 10 And Above
- 10 - 0
- 0 - -5
- -5 - -10
- -10 - -15
- -15 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -50 And Below

**Proposed Structures**

- Dike
- Pile
- Weir

**MORO CHUTE**

- Ste. Genevieve
- Proposed Structures
- Elevation
- LWRP (Feet)
- 10 And Above
- 10 - 0
- 0 - -5
- -5 - -10
- -10 - -15
- -15 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -50 And Below

**US ARMY ENGINEERING DIVISION**

**CORPS OF ENGINEERS**

**ST LOUIS, MISSOURI**

**AVOID AND MINIMIZE PROGRAM 2012**

**MIDDLE MISSISSIPPI BASIN**

**MORO CHUTE; FME MODEL**

**MOORE AND MINIMIZE PROGRAM 2012**

**PHASE AND MINIMIZE PROGRAM 2012**

**PHASE AND MINIMIZE PROGRAM 2012**
**Elevation**

**LWRP (Feet)**

- **10 And Above**
- **10 - 0**
- **0 - 5**
- **-5 - 10**
- **-10 - 15**
- **-15 - 20**
- **-20 - 30**
- **-30 - 40**
- **-40 - 50**
- **-50 And Below**

---

**Replication Test** vs. **Alternative 15**

**Proposed Structures**

- Dike
- Pile
- Weir

---

**MORO CHUTE**

**Missouri**

**Replcation Test**

**Alternative Testing**

---

**St. Genevieve**
**Elevation**

LWRP (Feet)

- 10 And Above
- 10 - 0
- 0 - -5
- -5 - -10
- -10 - -15
- -15 - -20
- -20 - -30
- -30 - -40
- -40 - -50
- -50 And Below

**Proposed Structures**

- Dike
- Pile
- Weir

---

**Replciation Test vs. Alternative 17**

- Moro Chute
- Missouri

---

**US ARMY ENGINEERING DIVISION CORPS OF ENGINEERS**
**ST. LOUIS, MISSOURI**

**MIDDLE MISSISSIPPI BASIN MORO CHUTE MARK MODEL INVESTIGATION PROGRAM 2012**

**PLATE NUMBER 09**

**REPLICATION TEST VS. ALTERNATIVE 17**
REPLICATION TEST

 vs .

 ALTERNATIVE 18

Elevation
LWRP (Feet)

- 10 And Above
- 10 - 0
- 0 - 5
- -5 - -10
- 10 - -15
- 15 - -20
- 20 - -30
- 30 - -40
- 40 - -50
- -50 And Below

Proposed Structures

Dike
Pile
Weir
REPLICATION TEST

ET

LW

10 And Above

10 - 0

0 - -5

-5 - -10

-10 - -15

-15 - -20

-20 - -30

-30 - -40

-40 - -50

-50 And Below

Proposed Structures

Weir

Pile

Dike

10 And Above

10 - 0

0 - -5

-5 - -10

-10 - -15

-15 - -20

-20 - -30

-30 - -40

-40 - -50

-50 And Below

Proposed Structures

Weir

Pile

Dike
Elevation
LWRP (Feet)

- 50 And Below
- 40 - 50
- 30 - 40
- 20 - 30
- 15 - 20
- 10 - 15
- 5 - 10
0 - 5
10 - 0
10 And Above
MORO CHUTE MODEL:
AVOID AND MINIMIZE PROGRAM 2012
MISSISSIPPI BASIN
MORO CHUTE/HEC MODEL
AVOID AND MINIMIZE PROGRAM 2012
LWEERMOD/HEC-MORO CHUTE.INDX
Elevation
LWRP (Feet)

- 10 And Above
- 10 - 0
- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 And Below

Proposed Structures
Dike
Pile
Weir

Repliation Test vs. Alternative Testing

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

MIDDLE MISSISSIPPI BASIN MORO CHUTE IRIA MODEL 6/6/2012 MIDDLE MISSISSIPPI BASIN MORO CHUTE INDEX