Landslide Investigation on State Route 7 along the Ohio River

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Gallia 7 Landslide Area

Gallipolis, Ohio

Ohio River

Project Area
Physiographic Provinces

- Huron-Erie Lake Plains
- Till Plains
- Central Lowland
- Appalachian Plateaus
- Glaciated Allegheny Plateaus
Cross-Section

Vertical Scale Exaggerated 2x

BB-1 Sandstone Bluff
BB-2 Upper Terrace
BB-3 SR 7 Lower Terrace
BB-4 Lower Slope

Legend:
- Silt and Clay, Silty Clay, Clay
- Sand, Gravel, Silt
- Shale
- Claystone
- Siltstone, Sandstone, Limestone

Ohio River EL 537.3’ (Normal Level)
EL 485’ Bottom of Ohio River

Sandstone Bluff
Upper Terrace
Silt and Clay, Silty Clay, Clay
Sand, Gravel, Silt
Shale
Claystone
Siltstone, Sandstone, Limestone
**Cross-Section**

Vertical Scale Exaggerated 2x

- **EL 900’ Lake Tight**
- **EL 500’ Bottom of Deep Stage**
  - **Cincinnati River**
- **EL 500’ Bottom of Deep Stage**
- **SR 7**
- **BB-1** Sandstone Bluff
- **BB-2** Upper Terrace
- **BB-3** Lower Terrace
- **BB-4** Lower Slope

**Legend**
- Silt and Clay, Silty Clay, Clay
- Sand, Gravel, Silt
- Shale
- Claystone
- Siltstone, Sandstone, Limestone

**Normal Level**
- **Ohio River EL 537.3’**
- **EL 485’ Bottom of Ohio River**
Extent of Illinoian Glacier

Post Illinoian River System

Mew Martinsville River
Cross-Section

Vertical Scale Exaggerated 2x

BB-1
Sandstone Bluff

Upper Terrace

BB-2

BB-3
SR 7

Lower Terrace

BB-4

Lower Slope

Silt and Clay, Silty Clay, Clay

Sand, Gravel, Silt

Legend

Shale

Claystone

Siltstone, Sandstone, Limestone

EL 900’ Lake Tight

EL 700’ to 750’ Post Illinoian Slackwater Lake

EL 500’ Bottom of Deep Stage Cincinnati River

EL 485’ Bottom of Ohio River

Ohio River EL 537.3’ (Normal Level)
Colluvial Slope Formation
Gallia 7 Landslide Area
Gallia 7 Landslide Area

Gallipolis, Ohio

Ohio River

Project Area

Area 1

Area 2

Area 3
Inclinometer Displacement vs Time

Legend:
- BB-2
- BB-3
- BB-4
- CB-2
- CB-3
- CB-4
- CB-5

Times of increased displacement:
- CB-4
- BB-3
Inclinometer Displacement vs Time

Legend
- BB-2
- BB-3
- BB-4
- CB-2
- CB-3
- CB-4
- CB-5

Times of increased displacement

Displacement, inch

Jul-99 Dec-99 Jul-00 Dec-00 Jul-01 Jan-02 Jul-02 Jan-03 Jul-03 Jan-04 Jul-04
Precipitation and Ohio River Level

Legend
- Weekly Precip
- Ohio River
Cross-Section

Vertical Scale Exaggerated 2x

- Sandstone Bluff
- Upper Terrace
- Phreatic Surface
- Median Water Level
- SR 7
- Lower Terrace
- Lower Slope
- Ohio River EL 537.3' (Normal Level)

Legend:
- Silt and Clay, Silty Clay, Clay
- Sand, Gravel, Silt
- Shale
- Claystone
- Siltstone, Sandstone, Limestone
Conclusions

- There are multiple slides at or above bedrock.
- Slope movement is greatest near Ohio River and decreases upslope.
- Rate of slope movement increases after a sudden rise and fall of the Ohio River.
- Movement of lower slope is triggering slope movement of the lower terrace and then the upper terrace.