



# **Modernizing the Ohio River Navigation System**

**Presented By: R. Barry Palmer**

**DINAMO, The Association For The  
Development Of Inland Navigation  
In America's Ohio Valley**



# Modernizing The Ohio River Navigation System

McAlpine Lock Replacement



**By Focusing On The Importance  
Of The River To The Economy Of  
The Nation/Region**

**McAlpine Lock Replacement**





- **DINAMO Created in 1981**

- **Private Sector, State Government, Labor Leaders in the Ohio Valley**

- **16 System Locks/Dams Need Improvement by 2000 -- National Waterways Study**

- **17 Authorized for Construction, Under Construction, or Complete, 6 More Identified, \$7 Billion**

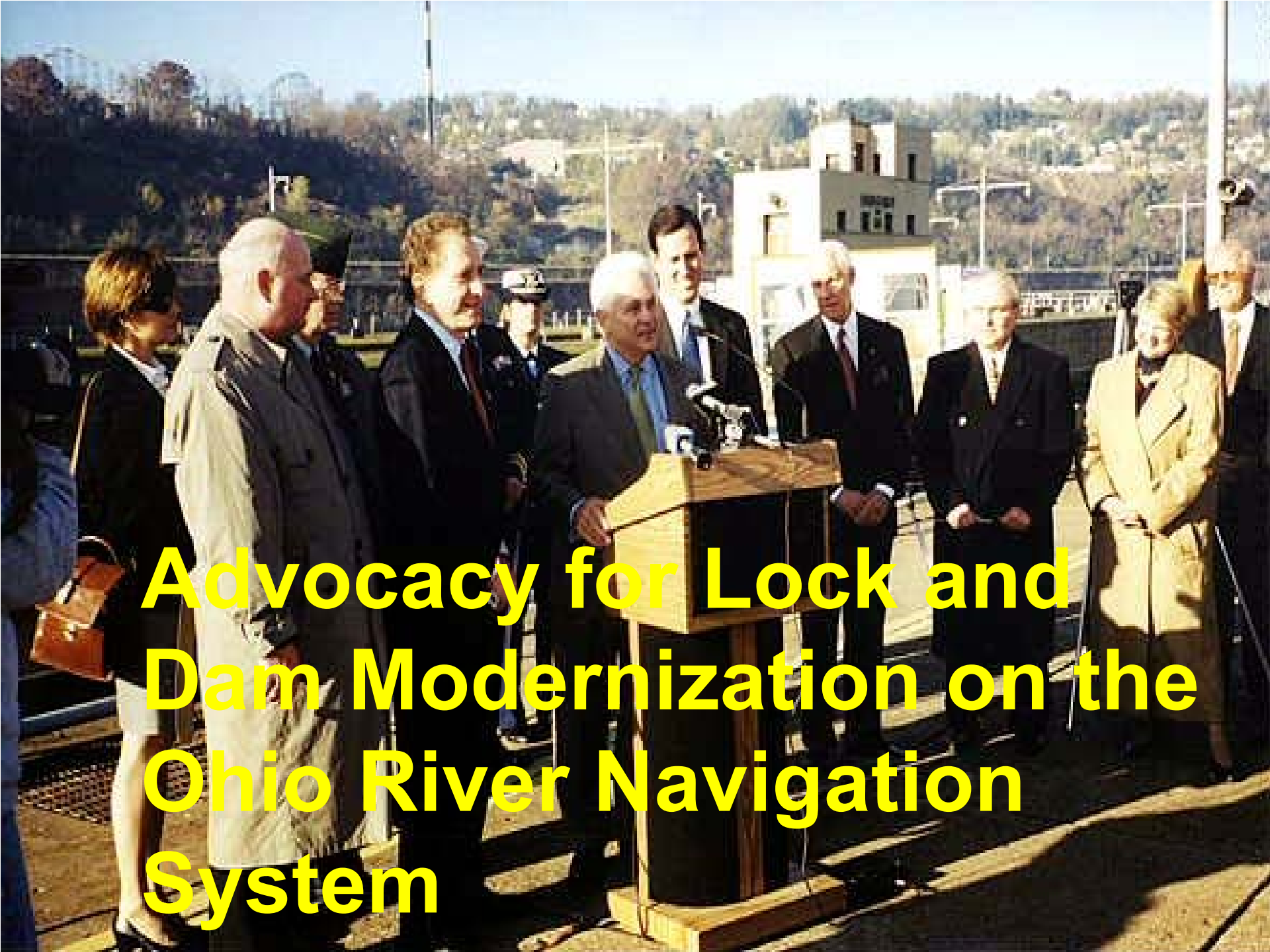




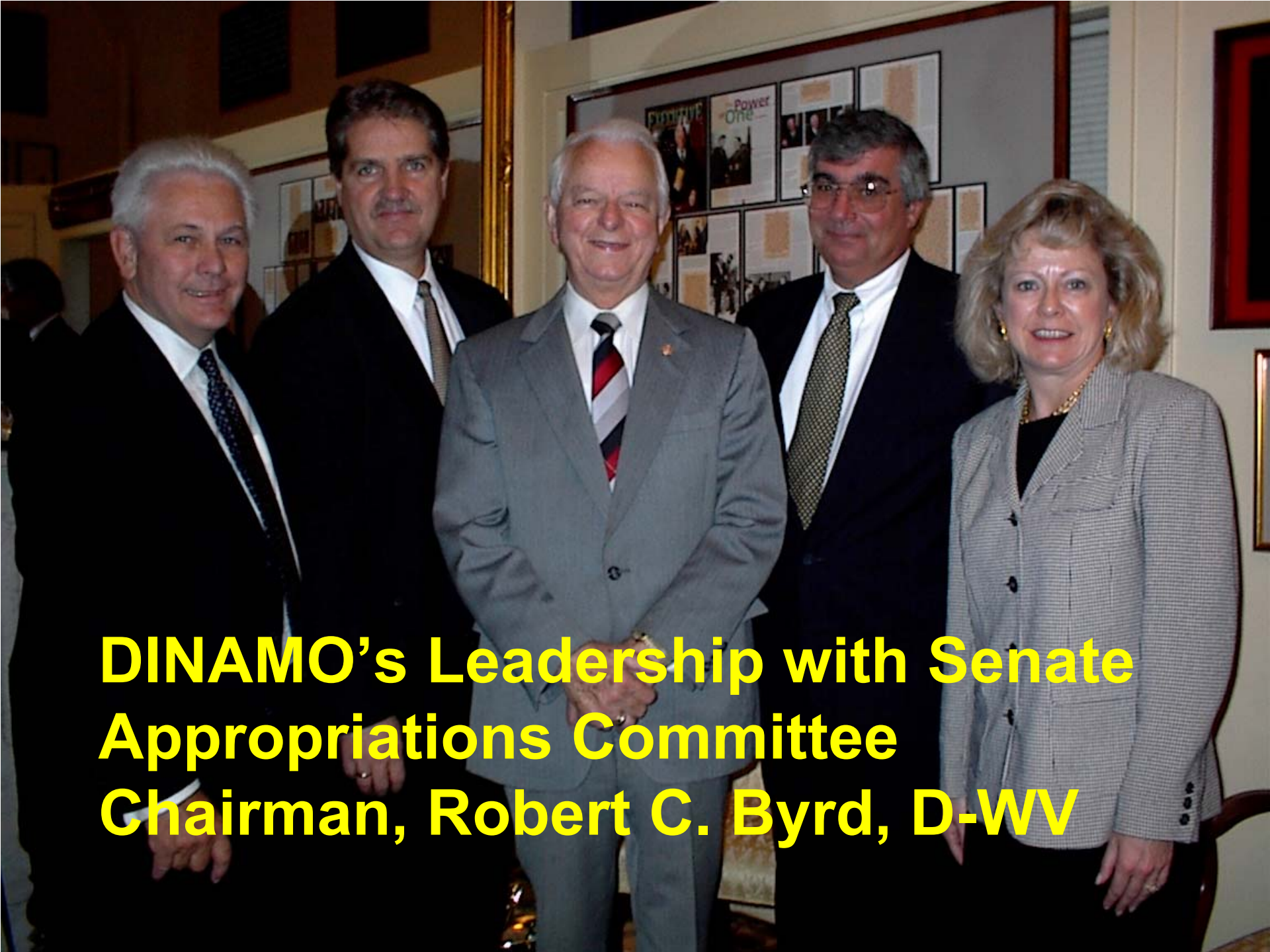
## WHAT DOES DINAMO DO?

- Work With The US Army Corps Of Engineers, 4 Districts, 1 Division, Headquarters, Plan, Design, Engineer, Build
- Principally Educate Congressional Interests At Home and in Washington DC
- To Authorize And Fund Lock And Dam Modernization Projects





**Advocacy for Lock and Dam Modernization on the Ohio River Navigation System**



**DINAMO's Leadership with Senate Appropriations Committee Chairman, Robert C. Byrd, D-WV**

# Congressman Jack Murtha Inspects L/D 4 Monongahela River



Navigation structures are necessary to make inland waterways viable, year-round transportation corridors. The US Army Corps of Engineers builds, maintains and improves navigation structures on Pittsburgh's three rivers — the Allegheny, Ohio and Monongahela!

## The Lower Monongahela River Project

will keep river transport safe and economical through the lower part of the Monongahela River

Existing	Future
 L/D 2 Braddock	 L/D 4 Braddock
 L/D 3 Elizabeth	 L/D 4 Elizabeth

Locks and Dams 2, 3 and 4 on the Monongahela River are the three oldest currently operating navigation facilities on the Mon River. These locks experience the highest volume of commercial traffic on the entire Monongahela River System and the pools created by these dams are popular with recreational boaters.

The Lower Mon Project will replace the nearly 100 year old fixed crest dam at Locks and Dam 2 with a gated dam, remove Locks and Dam 3, and construct two new larger locks at Locks and Dam 4.

These improvements will create about the 100-foot deep channel.

When work is completed on the Lower Monongahela River Project, the entire Mon River will be one of the most efficient waterways in the world!

Existing River Profile

When Locks and Dam 3 will create a single pool and create the new 100-foot channel between Braddock and Elizabeth. From Elizabeth to Charles, the river will stay about 3 feet.



## Braddock Dam

US Army Corps of Engineers Pittsburgh District

### Dam Construction Sequence

- Stage 1  
Segment is assembled and launched from Liebherr existing facility.
- Stage 2  
Outfitting of Doghouse. Adds mooring, alignment and infilling equipment, extends piers.
- Stage 3  
As locks compartments are fixed with water segment sinks onto its drilled shaft foundation.
- Stage 4  
Underbital grouting seals areas around segment.
- Stage 5  
Infilling with bubble concrete repairs water in hollow compartments.
- Stage 6  
Final completion of the dam structure.

# Congresswoman Anne Northup Visits McAlpine Lock and Dam



# **Congressman Ed Whitfield at Kentucky Lock and Dam, Tennessee River**



# Congresswoman Melissa Visit Lock 4, Allegheny River



# America's Inland Navigation System





# Ohio River Navigation System

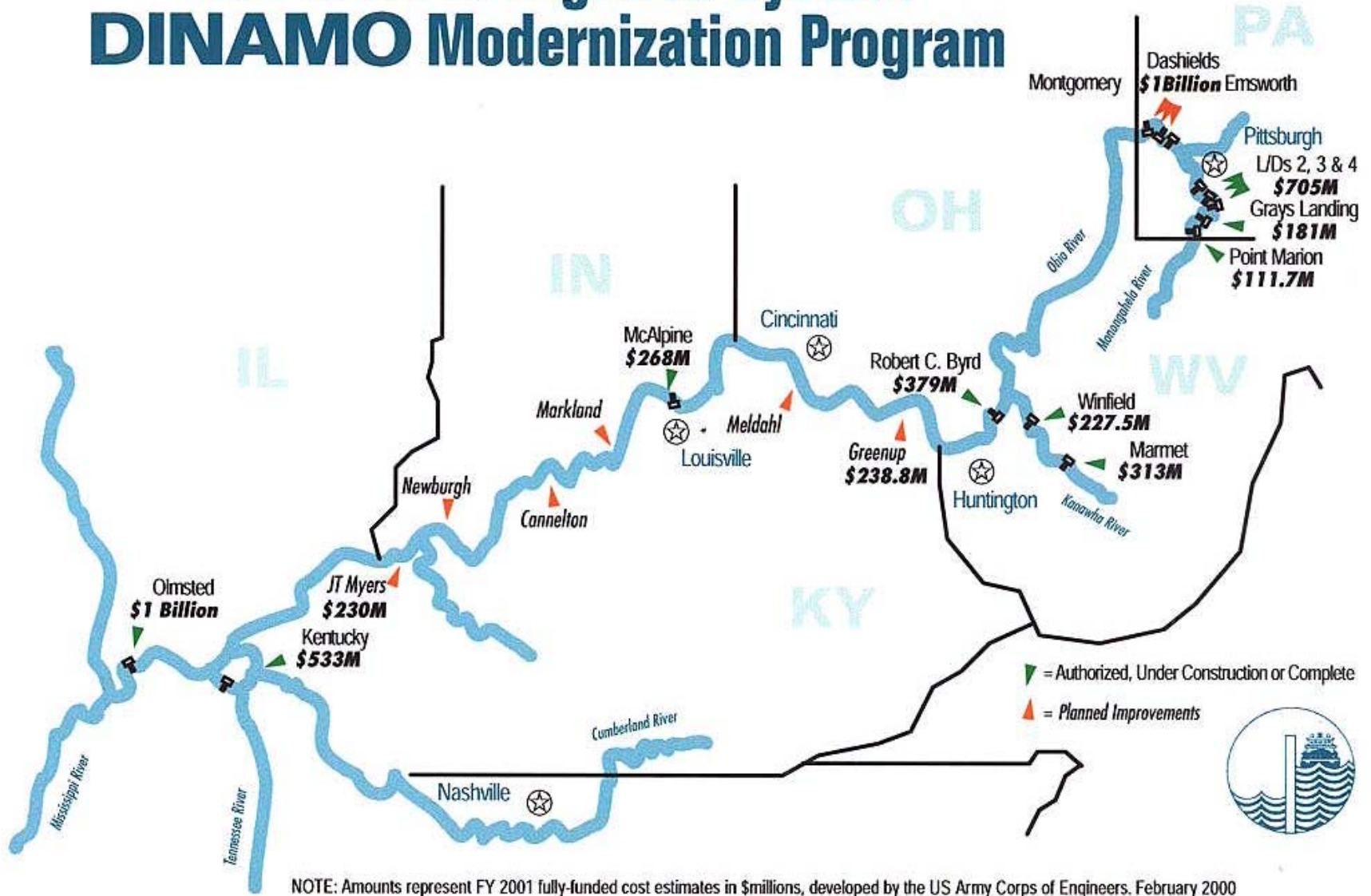
Ohio River Basin



- Ohio River and 7 Tributaries
- 69 locks, 104 chambers
- 2700 miles of waterways
- 275 million tons annually worth \$32 billion
- 61% is coal and petroleum products



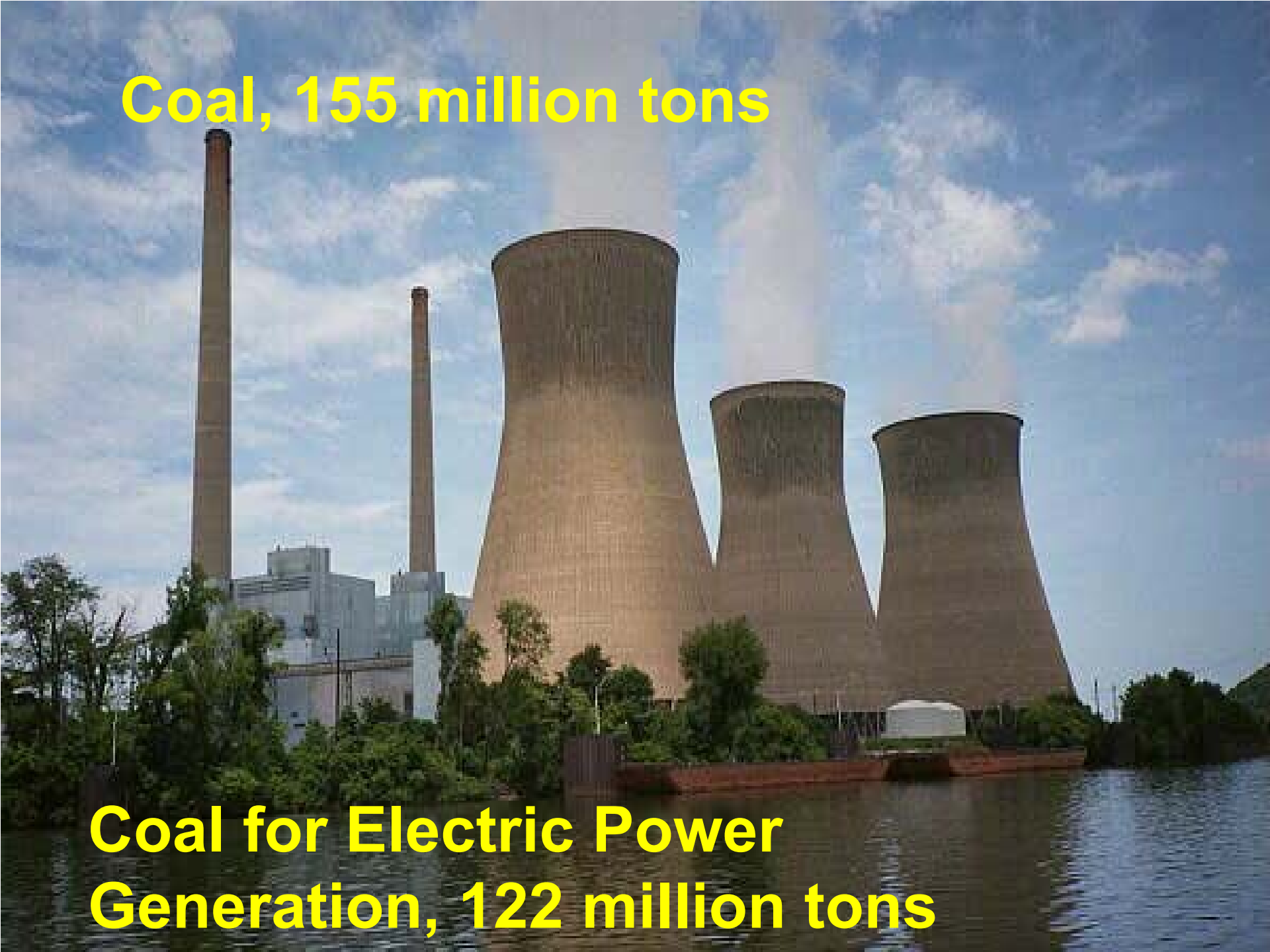
# Ohio River Navigation System DINAMO Modernization Program



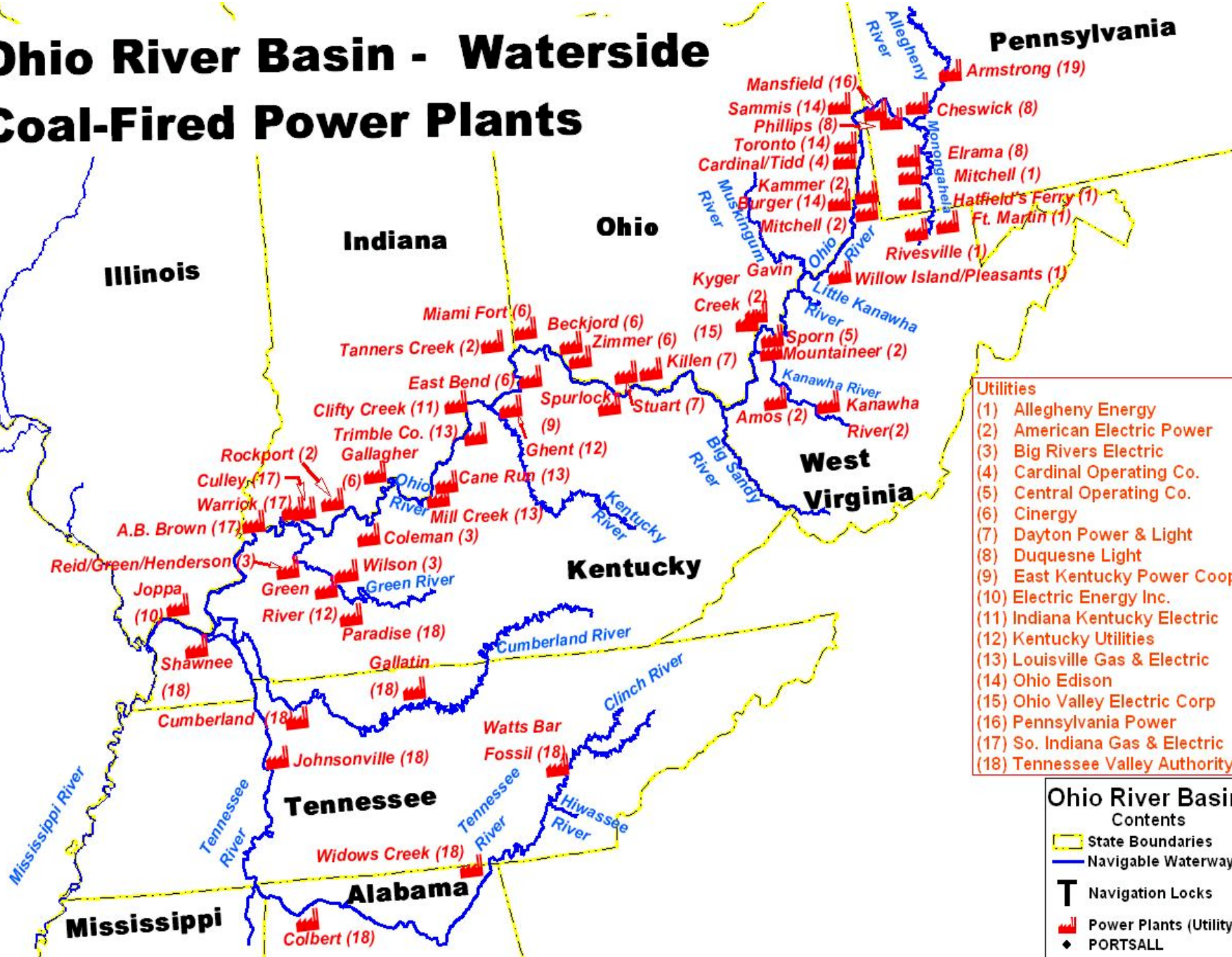
The Association for the Development of Inland Navigation in America's Ohio Valley  
**DINAMO** • 425 Sixth Avenue • Pittsburgh, Pennsylvania 15219-1811 • (412) 392-4550

**Coal, 155 million tons**

**Coal for Electric Power  
Generation, 122 million tons**



# Ohio River Basin - Waterside Coal-Fired Power Plants



- Utilities**
- (1) Allegheny Energy
  - (2) American Electric Power
  - (3) Big Rivers Electric
  - (4) Cardinal Operating Co.
  - (5) Central Operating Co.
  - (6) Cinergy
  - (7) Dayton Power & Light
  - (8) Duquesne Light
  - (9) East Kentucky Power Coop
  - (10) Electric Energy Inc.
  - (11) Indiana Kentucky Electric
  - (12) Kentucky Utilities
  - (13) Louisville Gas & Electric
  - (14) Ohio Edison
  - (15) Ohio Valley Electric Corp
  - (16) Pennsylvania Power
  - (17) So. Indiana Gas & Electric
  - (18) Tennessee Valley Authority

**Ohio River Basin Contents**

- State Boundaries
- Navigable Waterway
- Navigation Locks
- Power Plants (Utility)
- PORTSALL



**US Steel's Clairton Coke Works**



# Steel Coils Moving from Ohio Valley to Markets As Far Away As Mexico



# CARGO CAPACITY COMPARISON

ONE JUMBO  
HOPPER CAR  
(100 tons)

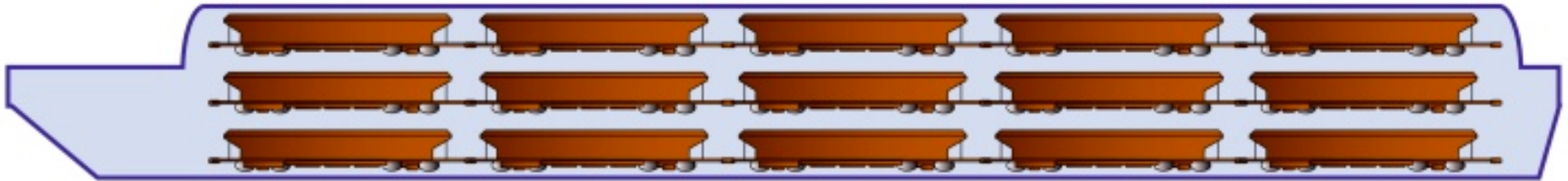


=

3.8 LARGE  
SEMI TRUCKS  
(26 tons each)



ONE BARGE (1,500 TONS) = 15 JUMBO HOPPER CARS



ONE BARGE (1,500 TONS) = 58 LARGE SEMI TRUCKS



15 BARGE TOW = 2¼ ONE-HUNDRED CAR UNIT TRAINS OR 870 TRUCKS



# 236 Waterside Chemical Plants, Terminals, Docks Located Along the Ohio River Navigation System





**144 Waterside Grain Elevators, Plants,  
Docks Located Along Ohio River  
System**



**A Petroleum Tow Moving Along the Ohio River, 250 Waterside Refineries, Tank Farms, Pipelines, Factories, Terminals Located Along Ohio River System**



**Aggregates: Sand and Gravel,  
Limestone, Gypsum, Stone, Soil and  
Dirt, 49 Million Tons, 2<sup>nd</sup> Largest  
Commodity Moved on the River**

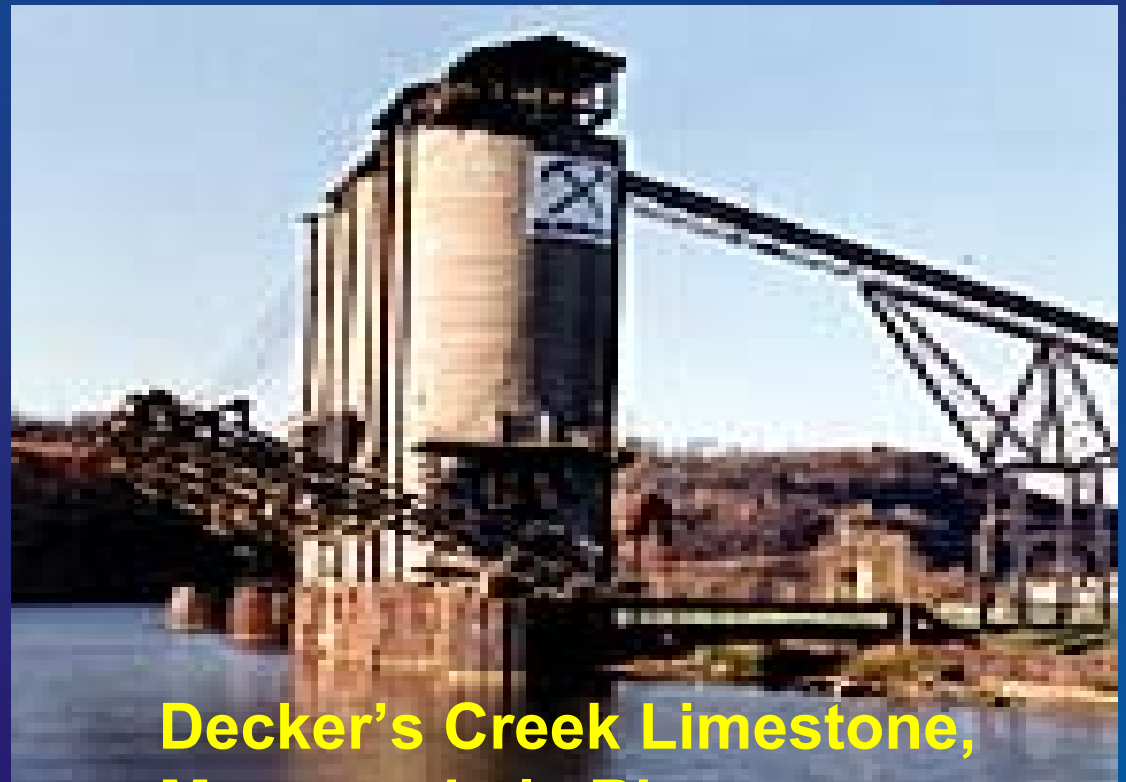
**382 Loading and Unloading Sites  
Located Along the Ohio River System**

**Aggregate Materials Go Mostly to Yards  
for Retail Sales to Construction  
Contractors or to Manufacture Ready-  
Mix Concrete or Asphaltic Materials.**



**Limestone, newest growing market for waterborne limestone, used in coal-fired power plants for desulfurization.**

**Indiana ranked 2<sup>nd</sup> in Limestone Shipments**



**Decker's Creek Limestone, Monongahela River**





# 1000 Manufacturing Plants, Power Plants, Terminals, Docks Located Along River System



# **Economic Impact of River System in W PA (Port of Pittsburgh Commission Study)**

- \$13.3 Billion in Economic Activity**
- \$460 Million in State and Local Taxes**
- 180,000 Family-Wage Jobs Tied to the River**
  - 52,924 direct jobs, port/shipper/consignee**
  - 89,689 indirect jobs, maintenance/repair, electric/gas/telephone/surface transport**
  - 35,332 induced, purchases by individuals directly employed by river system activity**

# Solutions to Problems

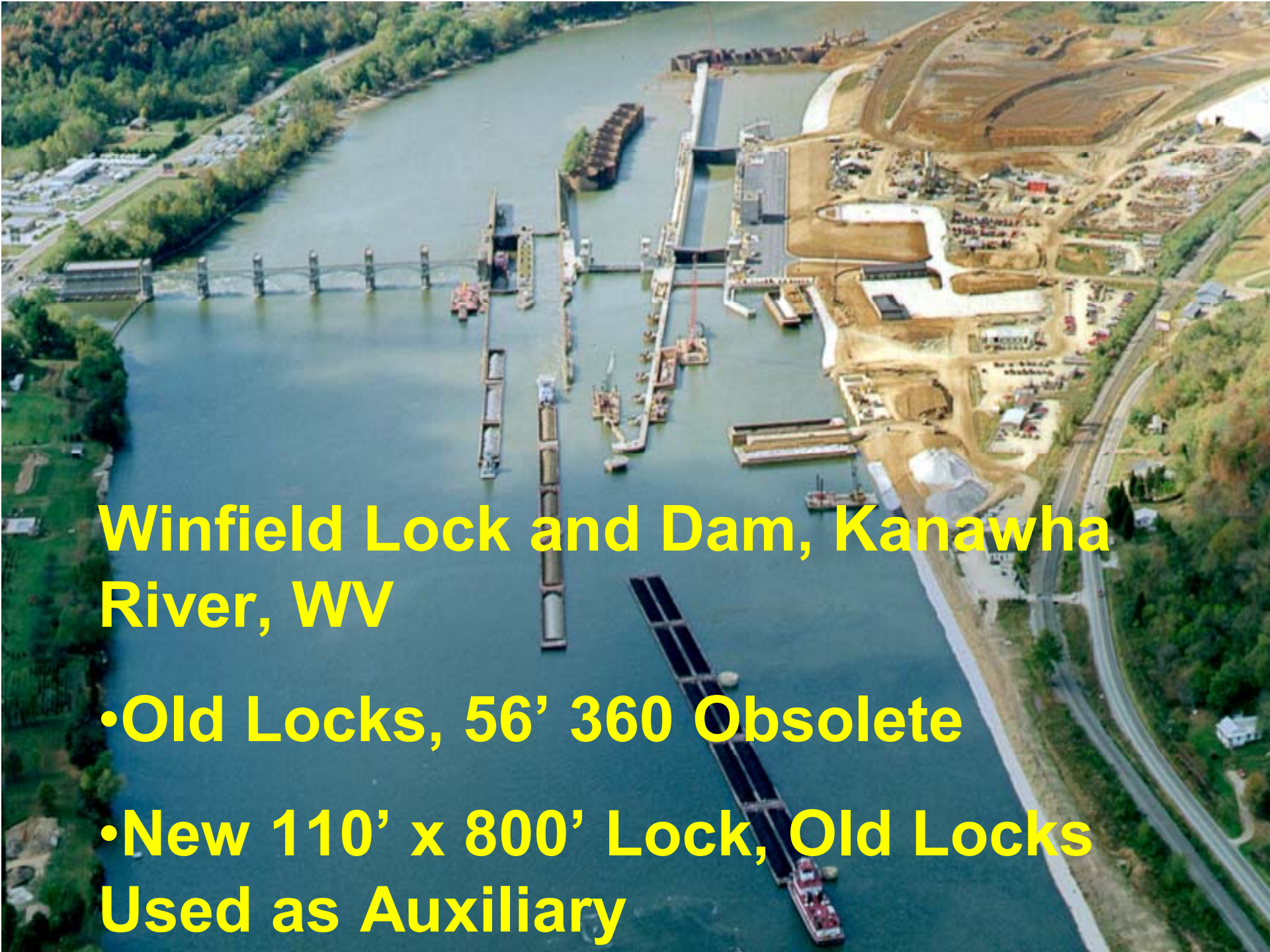
An aerial photograph of the Robert C. Byrd Locks and Dam on the Ohio River. The image shows a large concrete dam structure with a lock chamber in the center. To the left, there is a bypass canal with several lock gates. The surrounding area is a mix of green fields and wooded land. The river flows from the top right towards the bottom left.

**Robert C. Byrd Locks and Dam,  
1,200' x 110' Main Chamber, 600' x  
110' auxiliary in by-pass canal,  
major rehabilitation of dam**

**Replaces Gallipolis Locks**

- **Obsolete Locks, 600' x 110' Main Chamber, 360' x 110' auxiliary**

- **by 1990, 15 million tons annually diverted from the river unless larger locks constructed**



# Winfield Lock and Dam, Kanawha River, WV

- Old Locks, 56' x 360' Obsolete
- New 110' x 800' Lock, Old Locks Used as Auxiliary

# Olmsted Locks and Dam, Ohio River, IL/KY



- Replacing Locks and Dams 52 and 53, obsolete and beyond repair
- Original 600' x 110' locks built in 1920's, temporary 1,200 x 110' main lock at 52 built in 1969 with a 15 year design life

**Twin 1,200' x 110' locks, Submersible  
Dam, \$1 Billion**

An aerial photograph showing the US Steel's Edgar Thompson Works, Lock and Dam 2, and the Monongahela River. The image captures a large industrial complex with various buildings, smokestacks emitting white smoke, and a large dam structure. The river flows through the center, with a lock system visible. The surrounding area is densely populated with trees and some residential or commercial buildings.

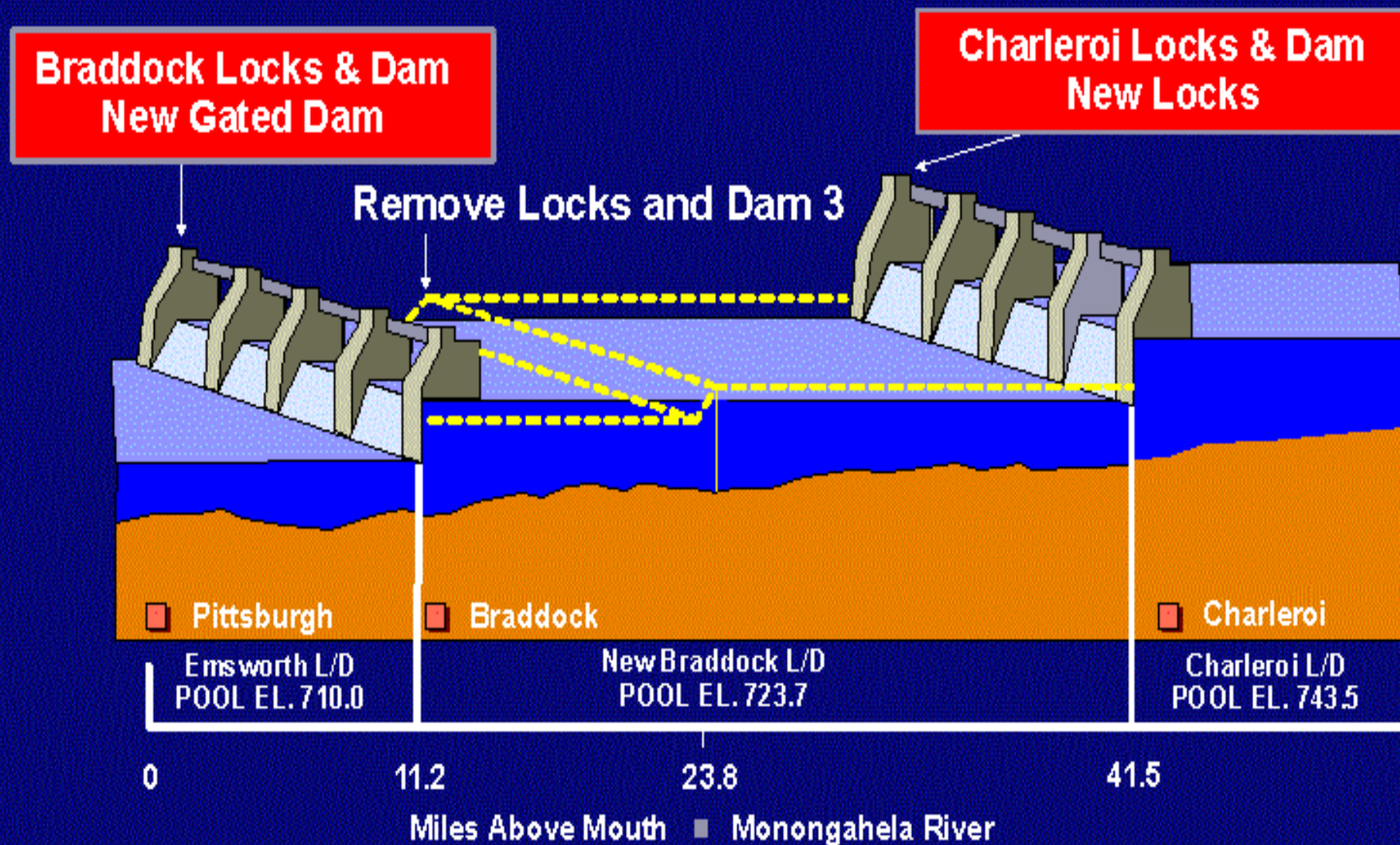
# US Steel's Edgar Thompson Works, Lock and Dam 2, Monongahela River

**Dam 2 is almost 100 years old**

- **Lock and Dam 3, almost 100 years old, Twin Locks are 360' x 56'**

- **Locks 4 are Obsolete, 360' x 56'**

# Monongahela River Proposed River Profile



# McAlpine Locks and Dam

An aerial photograph of the McAlpine Locks and Dam on the Ohio River. The image shows the main chamber with a large barge, auxiliary locks, and a dam structure in the background. A highway and a bridge are also visible in the foreground.

- Main Chamber, 110' x 1,200'
- Auxiliary Locks Obsolete and Beyond Repair

**Solution – Twin 110' x 1,200 locks**

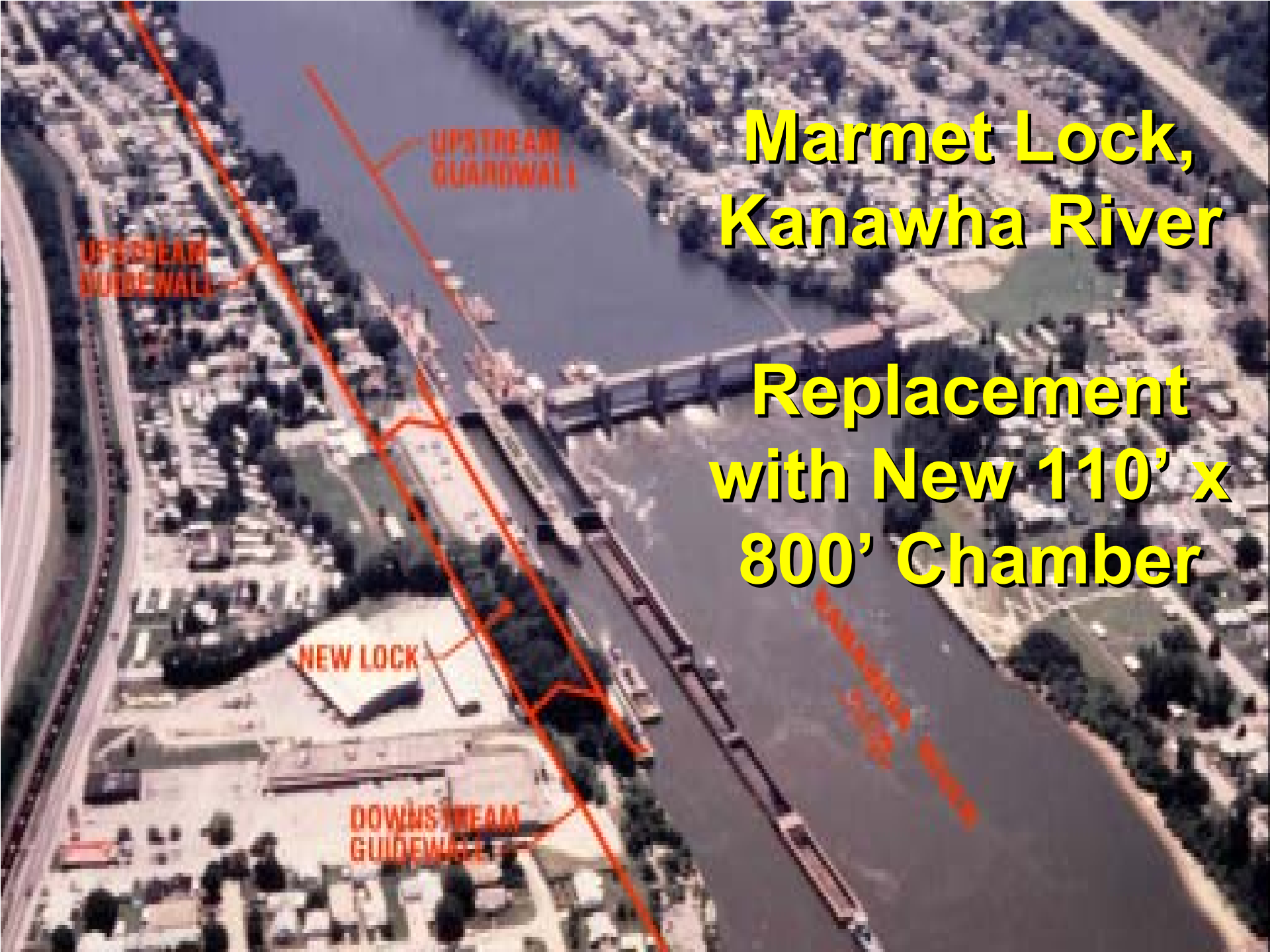
**McAlpine Locks and Dam,  
IN/KY, near Jeffersonville, IN**

# Kentucky Lock, Tennessee River, KY



# Marmet Lock, Kanawha River

Replacement  
with New 110' x  
800' Chamber



UPSTREAM  
GUIDEWALL

UPSTREAM  
GUIDEWALL

NEW LOCK

DOWNSWEEP  
GUIDEWALL

KANAWHA RIVER

# London Locks and Dam, Kanawha River, WV

## Major Rehabilitation

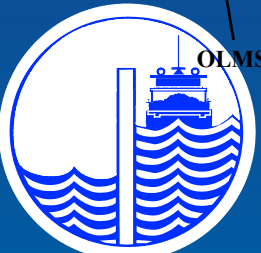
- Contract Award FY 2001,  
Extend Lock to Accommodate  
Two Jumbo Barges
- Rehab Complete FY 2002



# Ohio River Mainstem System Study



- Purpose of the study is to identify a comprehensive investment plan for the next 50 years
- Study is assessing system economic and environmental impacts associated with the investment plan

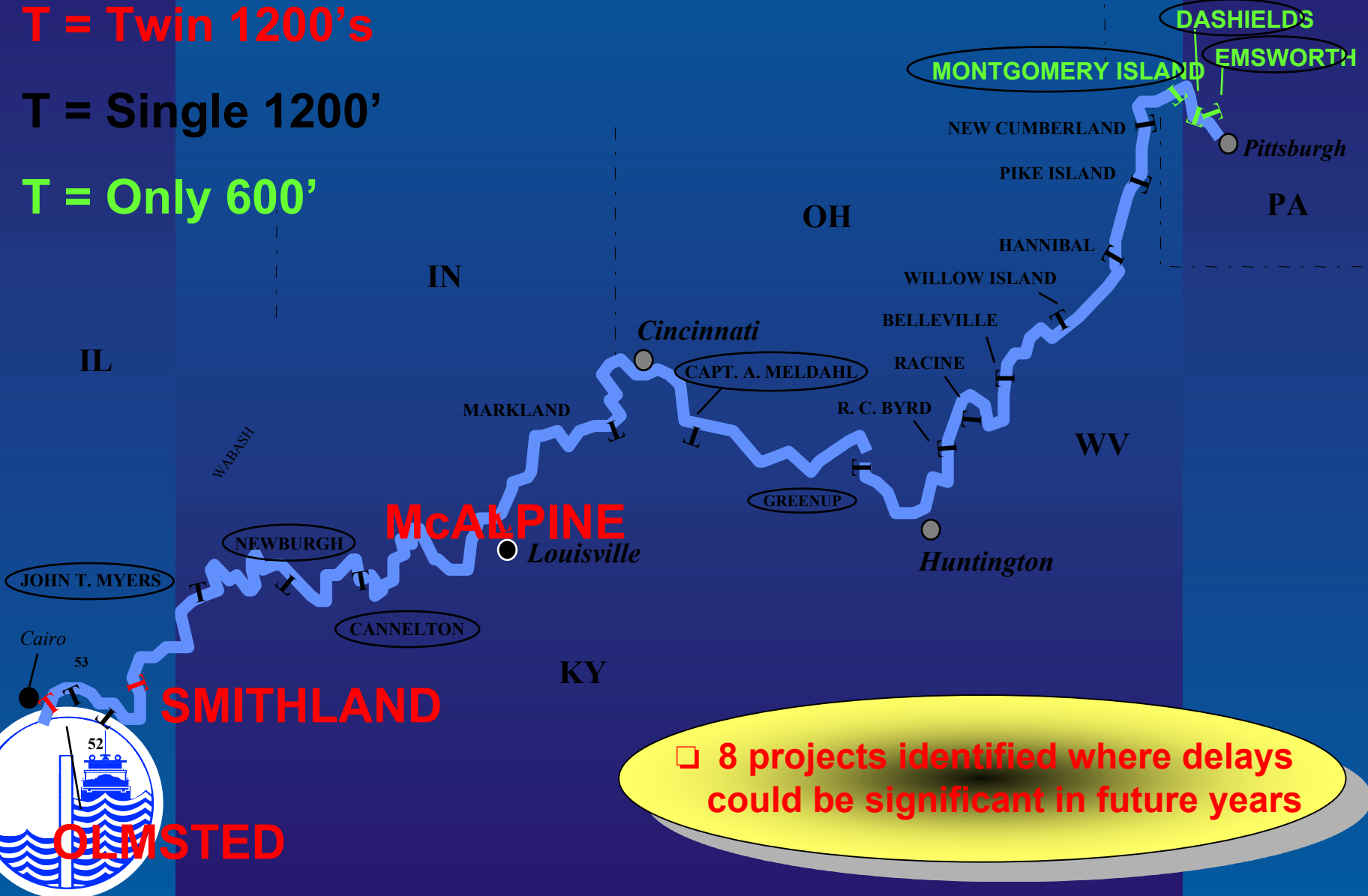


# Ohio River Mainstem System Study

T = Twin 1200's

T = Single 1200'

T = Only 600'



8 projects identified where delays could be significant in future years

# Ohio River Mainstem Study: WRDA 2000 Authorized Two Modernization Projects



## Greenup Locks and Dam

- Extend existing lock chamber from 600 ft to 1200 ft
- \$175M



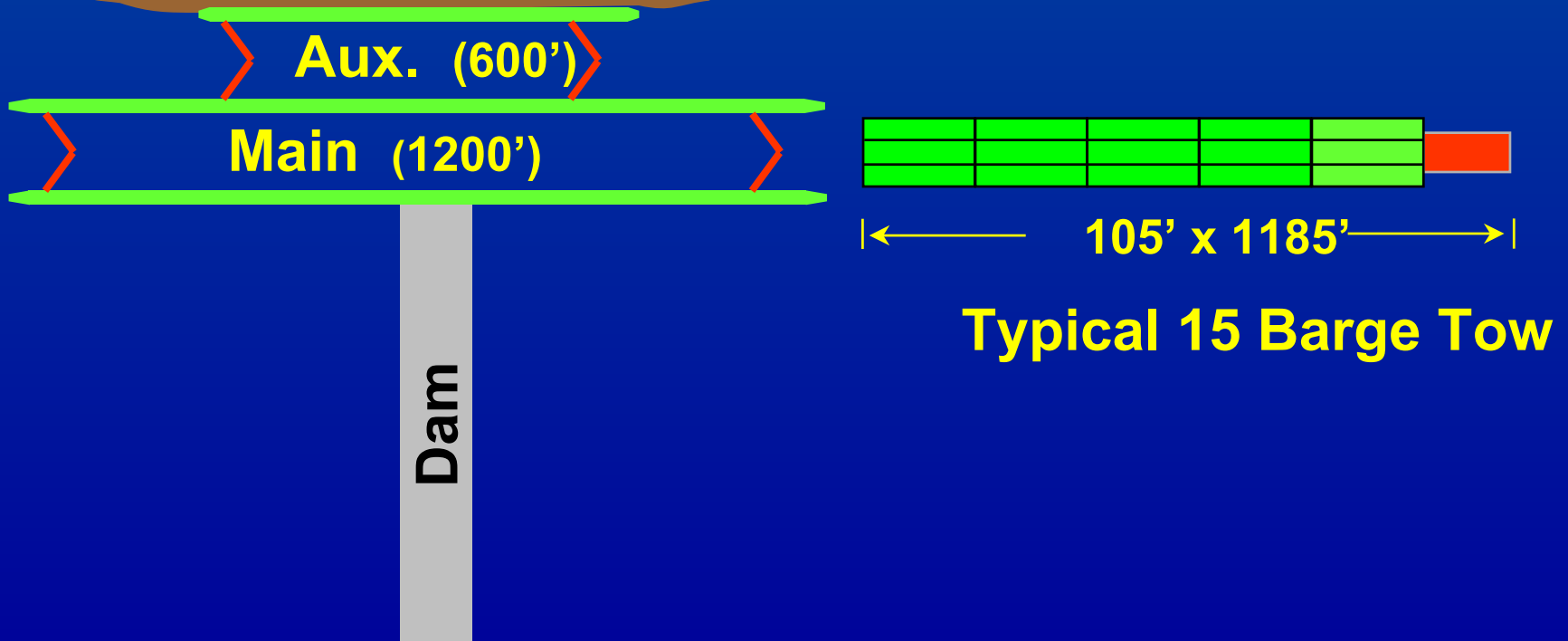
## J.T. Myers Locks and Dam

- Extend existing lock chamber from 600 ft to 1200 ft
- \$182M (current price level)



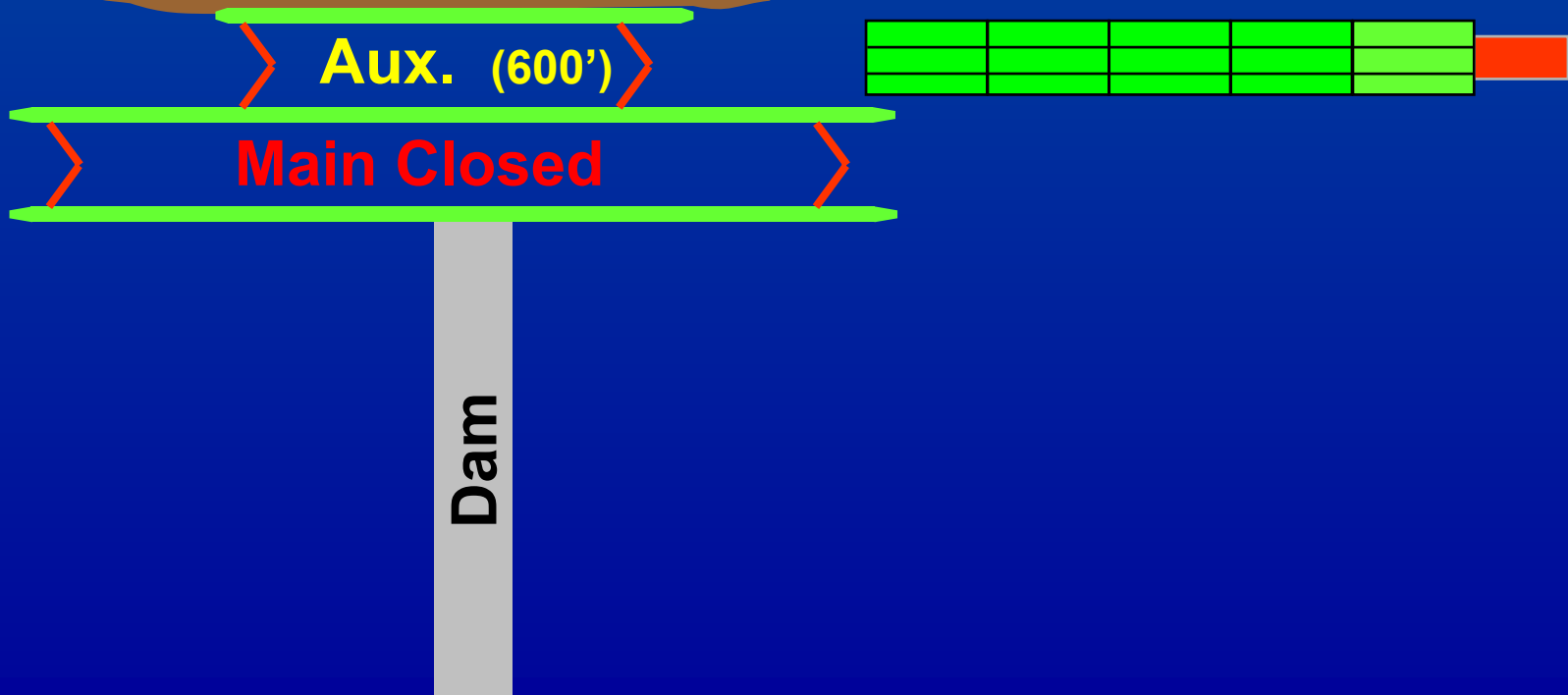
# Typical Ohio River Barge/Tow Configuration

- Both Chambers Open for Traffic
- Total Lockage Process - Approximately 1 Hour



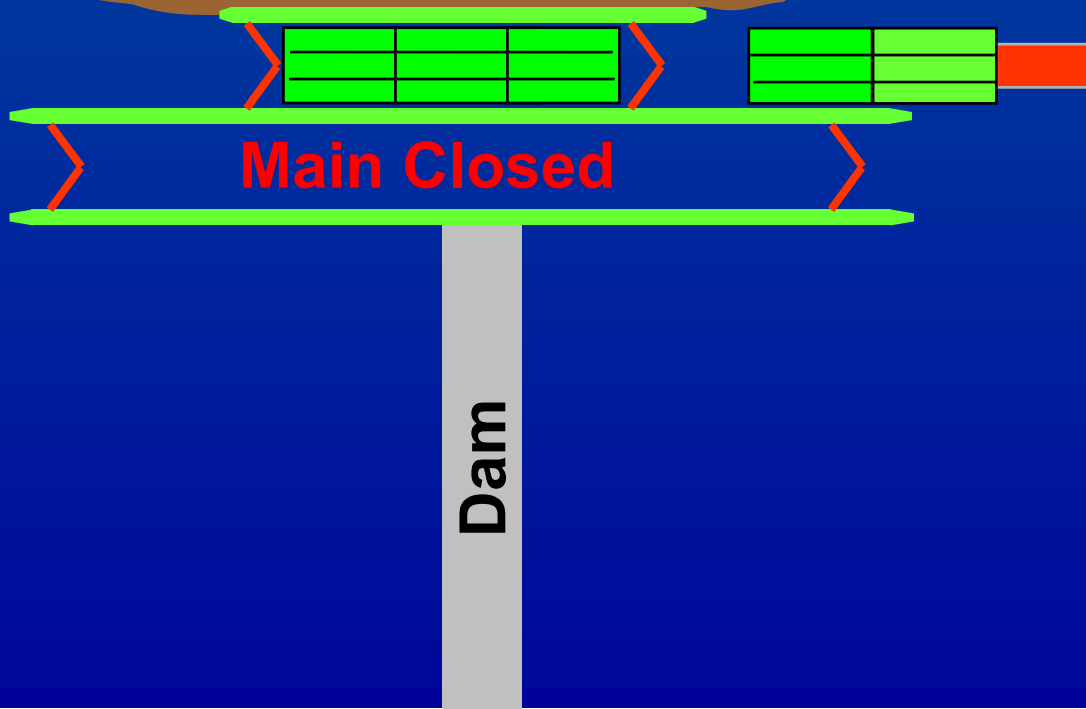
# Typical Ohio River Use of Auxiliary Locks

- Main Chamber Closed for Inspection/Repairs



# Typical Ohio River Use of Auxiliary Locks

- Tows Must “Double Cut” Through Smaller Auxiliary





## Lock Dewaterings :

- Inspections
- Maintenance
- Accidents
- Emergency Closures



# Ohio River Main Chamber Dewatering





**John T. Myers  
Project**

**Main Chamber Closure -  
Sept. 1989**

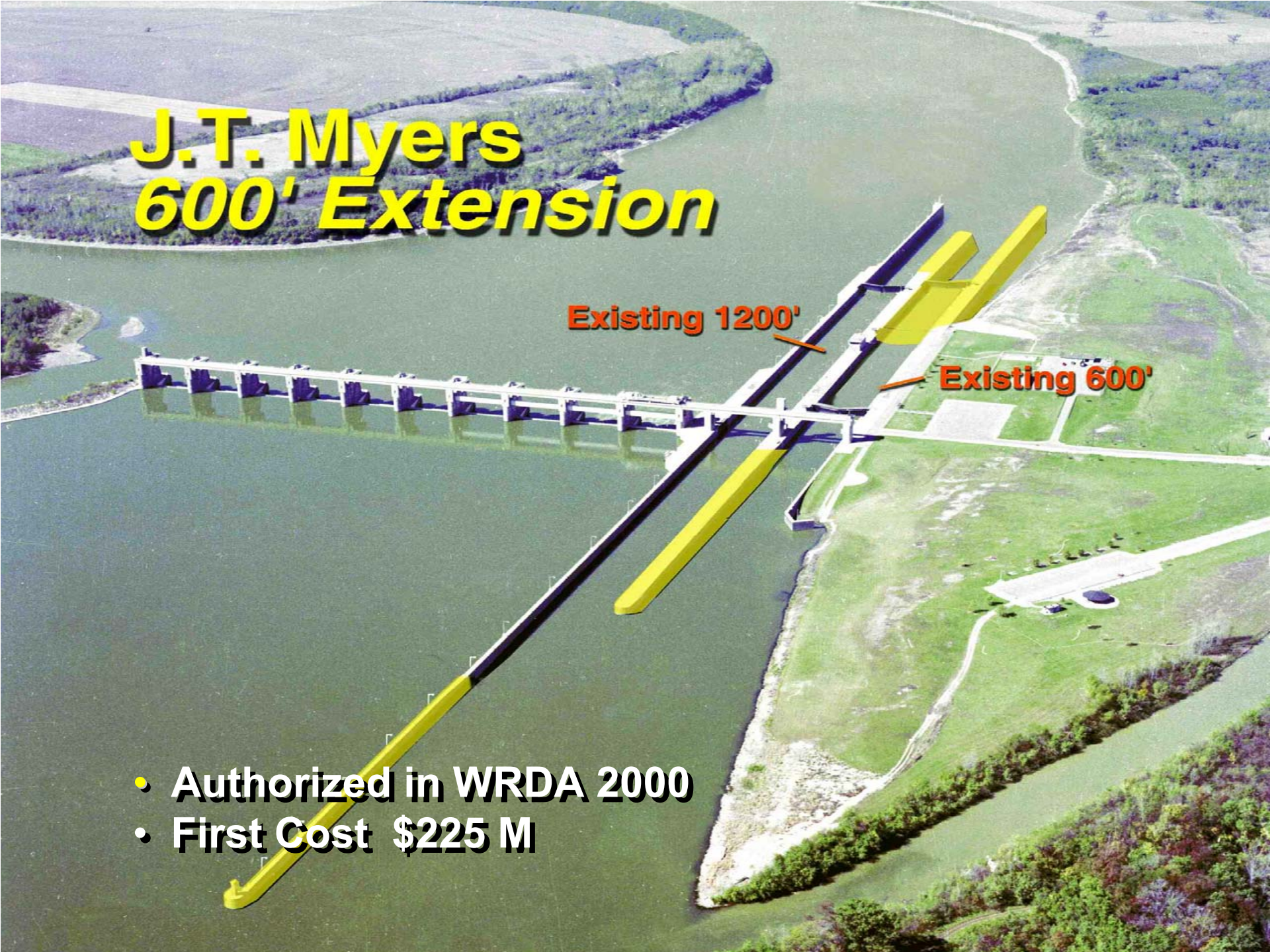
- *40-Day closure for lock maintenance*
- *Tow operating costs over \$400/hour*
- *Up to 4 days Tows Delay*
- *Estimated cost to industry: over \$20 million dollars in FY01 cost levels*

# J.T. Myers 600' Extension

Existing 1200'

Existing 600'

- Authorized in WRDA 2000
- First Cost \$225 M





## Development of Information/Communication Tools State, Congressional, Industry, Project Profiles





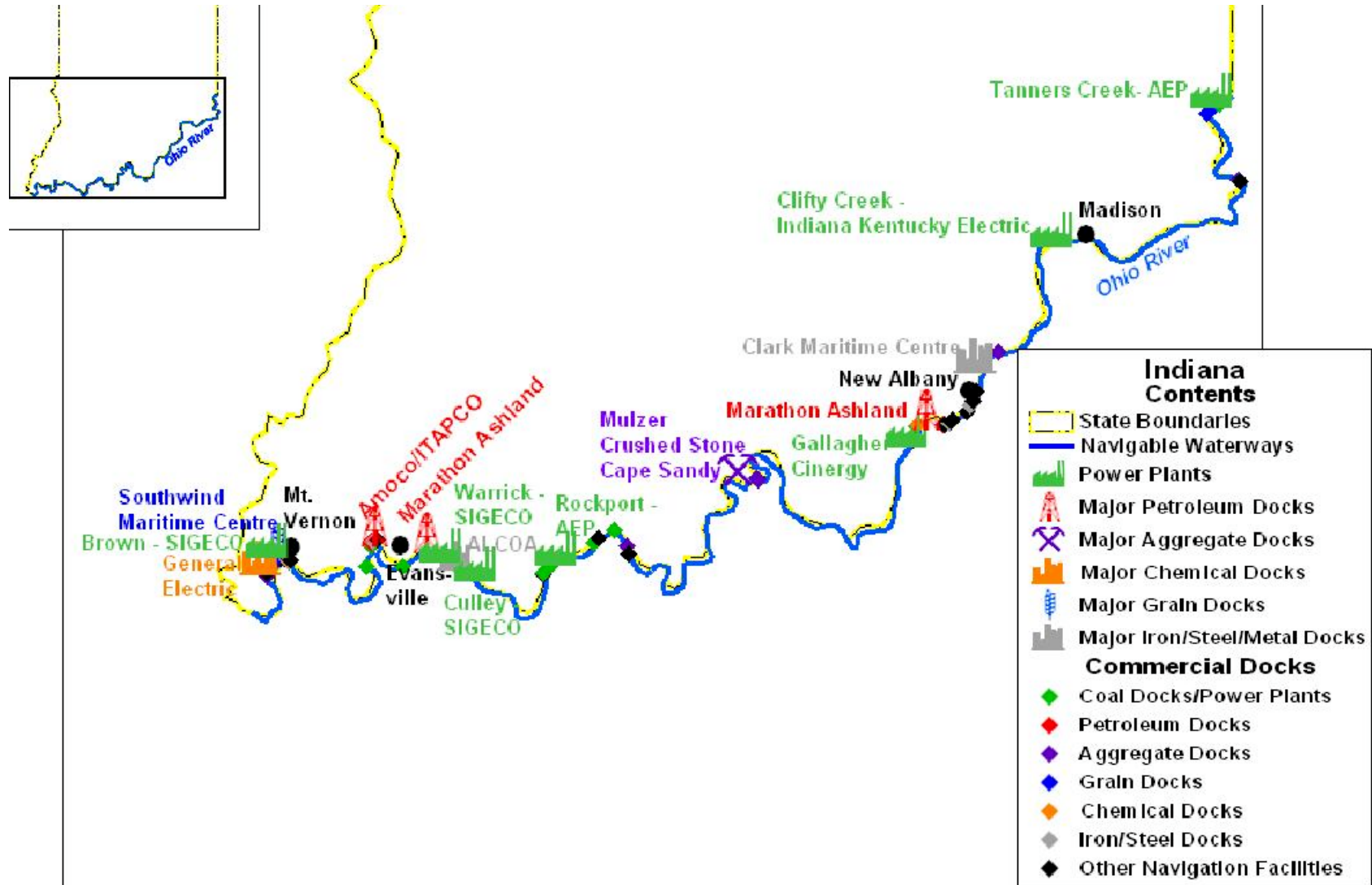
## **Indiana Senators Richard Lugar and Evan Bayh**

The State of Indiana borders 358 miles of the Ohio River, from mile 491 through mile 848. The Ohio River in this reach carries a variety of commodities, including coal, aggregates, grain, petroleum products and chemicals.

In 1999, 114 million tons of commodities (mostly coal, petroleum and aggregates) moved to, from, within and past Indiana and were valued at more than \$16.8 billion. Coal, the leading commodity, comprised 44% of the tonnage, followed by aggregates at 17%.

An analysis of the waterborne commerce data for the State of Indiana shows that approximately 11.2 million tons of commodities were shipped on the river system out of the state. Over half of this amount consisted of aggregates and coal. Docks in the state received nearly 25 million tons, with coal being the largest commodity. More than 3.2 million tons moved within the state. In 1999, the 39.4 million tons shipped to, from and within Indiana had a value of \$3.6 billion. Shippers moving commodities by barge to, from and within Indiana realized savings of over \$380 million compared to other transportation modes.

# 94 Manufacturing Facilities, Power Plants, Terminals and Docks Are Located Along Indiana's Navigable Rivers



# Indiana District 8

## Congressman John Hostettler



Indiana's 8<sup>th</sup> Congressional District borders a small but vital area of the Ohio River Basin. The district borders 79 miles of the river, from mile 769 to mile 848, which includes the Mount Vernon and Evansville areas.

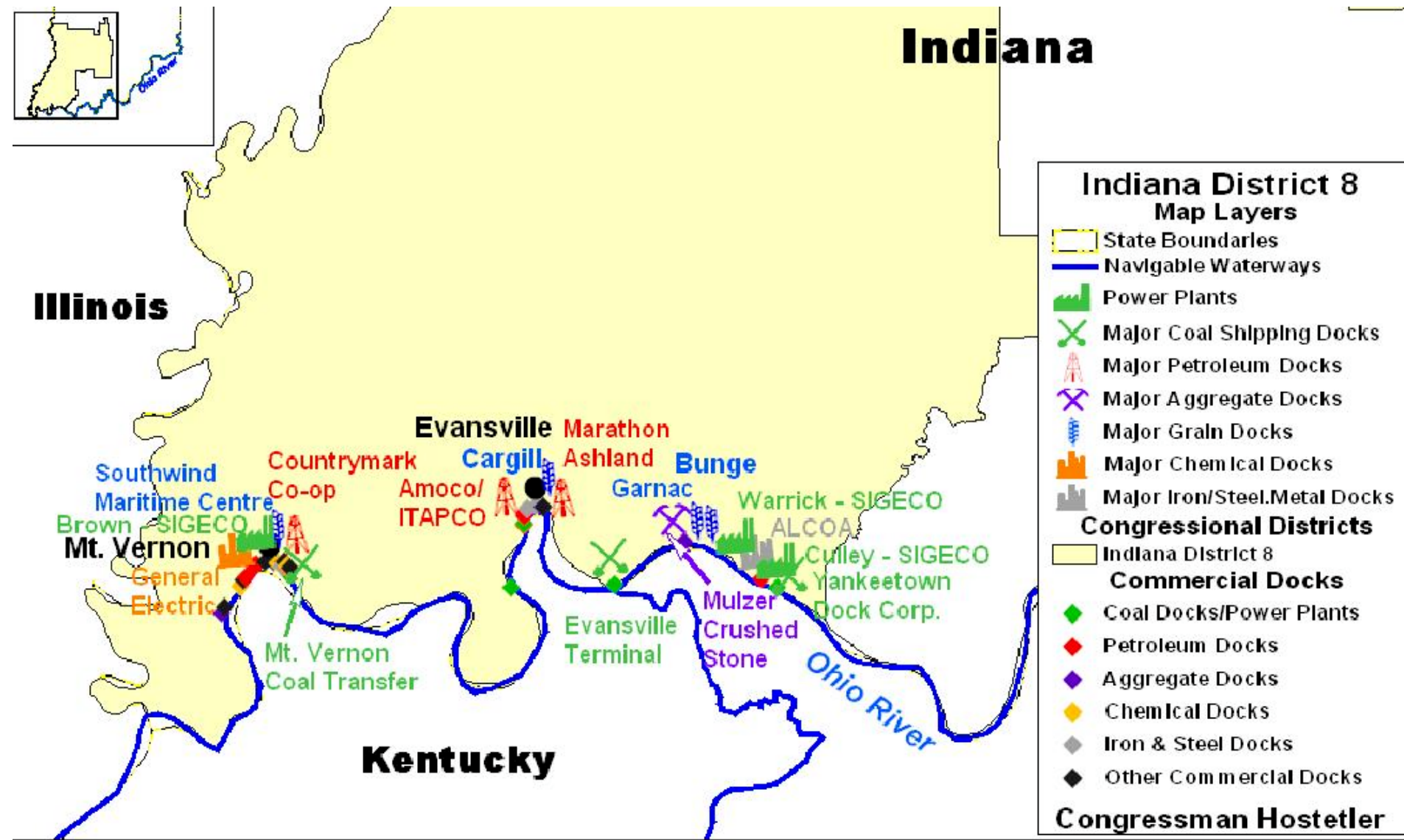
In 1999, more than 79 million tons of commodities (mostly coal, chemicals, iron, steel and aggregates) moved in, out, within or past this area of the Ohio River. These commodities had a total value of \$14 billion. Coal made up about 41% of the district traffic. Iron and steel were next, with 11% of the traffic.

Indiana Congressional District 8 Commodities Moved by Barge – 1999					
Commodity	Shipped	Received	Within	Total	Value
Coal	644,865	894,527	0	1,539,392	\$ 60
Petroleum	194,675	1,380,391	**	1,575,066	\$ 206
Aggregates	292,375	3,625,947	**	3,918,322	\$ 236
Grain	2,201,384	35,196	0	2,236,580	\$ 383
Chemicals	139,448	762,379	0	901,827	\$ 239
Ores/ Minerals	**	718,994	0	718,994	\$ 40
Iron & Steel	15,171	47,275	0	62,446	\$ 29
Other	63,082	1,927	124,320	189,329	\$ 65
<b>Total</b>	<b>3,551,000</b>	<b>7,466,636</b>	<b>124,320</b>	<b>11,141,956</b>	<b>\$1,258</b>

**\*\* Insufficient barge operators to release this tonnage – included in “Other Commodities.”**

**Source: U.S. Army Corps of Engineers Waterborne Commerce Statistics**

# 51 Manufacturing Facilities, Power Plants, Terminals & Docks Are Located Along Navigable Rivers in Indiana Congressional District 8

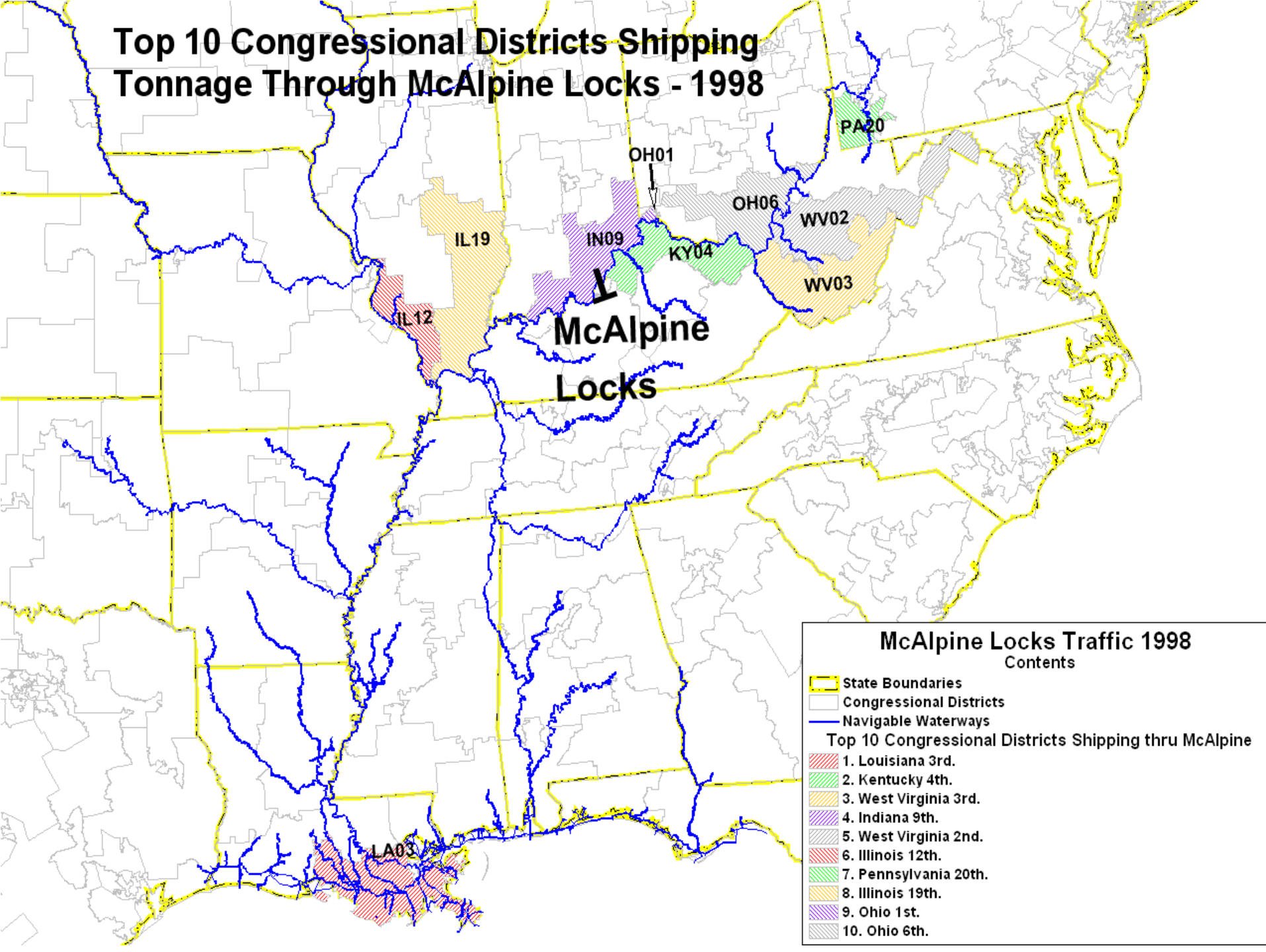


# Project Profiles



**McAlpine Locks  
and Dam, IN/KY,  
near Louisville, KY**

# Top 10 Congressional Districts Shipping Tonnage Through McAlpine Locks - 1998



# Industry Profiles



## Coal for Electric Power Generation

The Ohio River Basin is a major coal producing and power generating area. Utility companies have historically been attracted to a plentiful supply of water for plant use. The utilities also take advantage of the transportation savings provided by barges and the lock and dam system on the basin's waterways.



*American Electric Power's John C. Amos Plant – Kanawha River Mile 39.2  
Photo by Tim Smith, US Army Corps of Engineers*

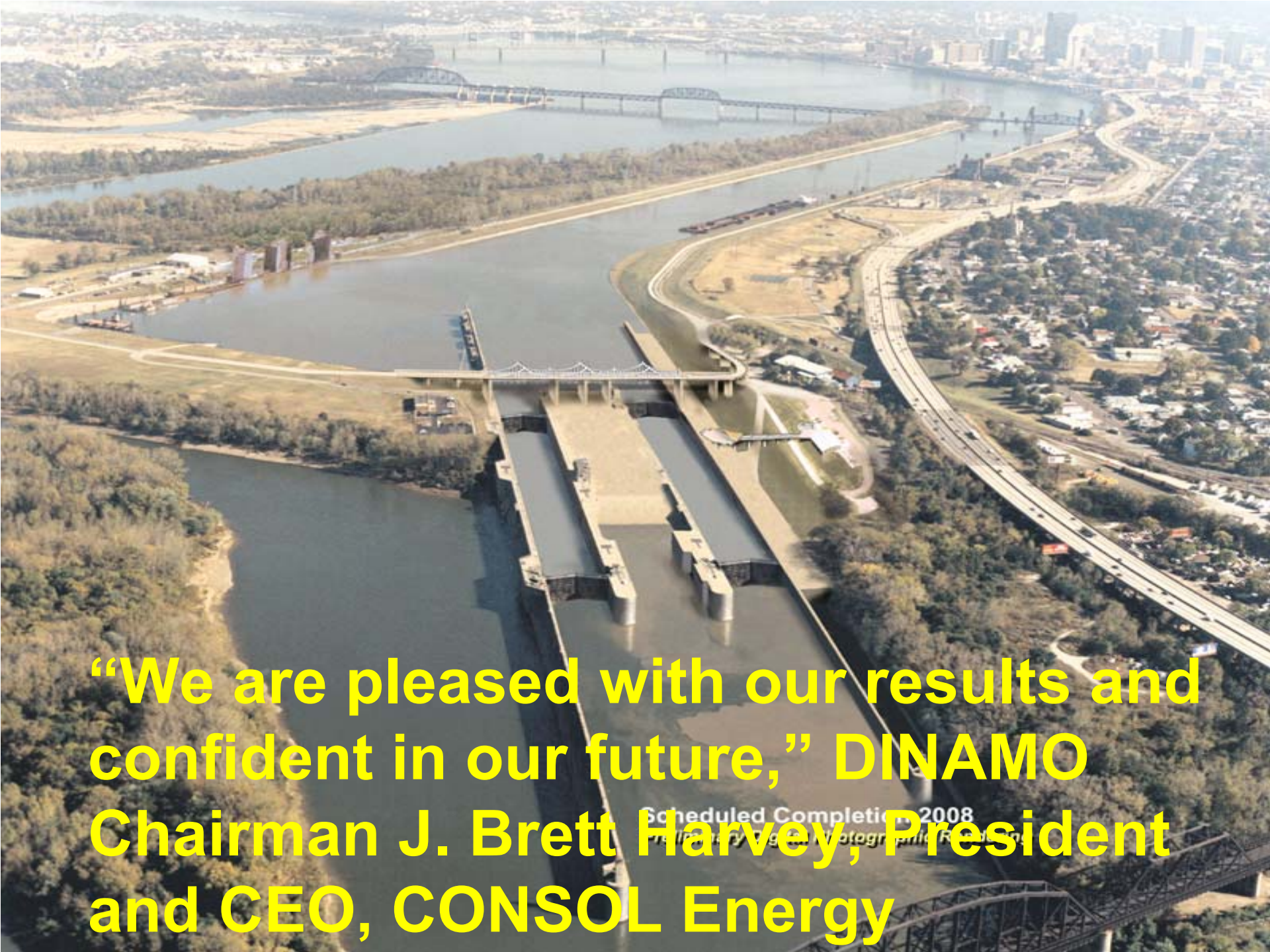
# Congressional Staff Aboard the M/V Ashland



An aerial photograph of a large red barge on a wide river. The barge is oriented vertically, with its bow at the top of the frame. The deck is covered with various pieces of equipment, including pipes, valves, and structural beams. The water is a murky brown color. In the background, a line of trees and a distant shore are visible under an overcast sky. The text is overlaid on the image in blue and yellow colors.

**Working with the US Army Corps of Engineers, Targeting Congressional Leaders, Communicating Message About Importance of River System to Nation's/Region's Economy, and Urging Improvements to our Waterways Infrastructure**

**Authorization and Funding of 17 Lock and Dam Project Improvements, \$5+ Billion**



**“We are pleased with our results and confident in our future,”** DINAMO Chairman J. Brett Harvey, President and CEO, CONSOL Energy

Scheduled Completion: 2008  
Photography: © 2008 Photographic Resources