



US Army Corps  
of Engineers

U.S. ARMY CORPS OF  
ENGINEERS

# Barkley L&D

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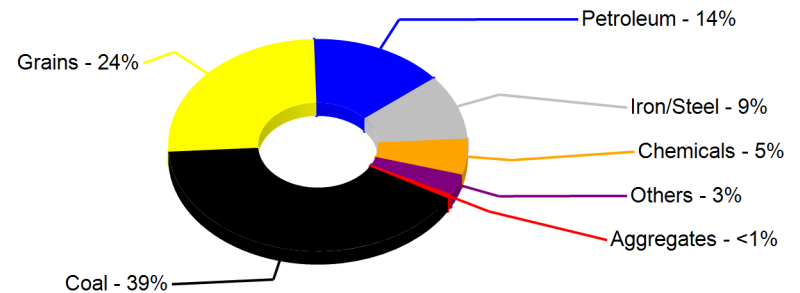


## 2016 Quick Facts

Commercial Lock Operations - 1,296	National Rank - 104
Short Tons (Thousands) - 7,248	National Rank - 84
Commodity Value (Millions) -	\$892.24
Average Tow Delay (HH:MM:SS) -	03:16:52

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

\*\* Remaining 4.49% Unable to release due to insufficient operators

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## Lock Information

Barkley Lock is located 30.6 river miles from where the Cumberland River joins the Ohio River at Smithland, Kentucky. The nearest community to the lock is Grand Rivers, Kentucky.

Barkley Lock was opened to navigation traffic in July of 1964. The lock chamber is 800-foot long and 110-foot wide. During normal lake levels, the lock will lift a boat 57-foot from the river below the dam to the lake above the dam. The lock releases over 37.5 million gallons of water each time is emptied.

Barkley Lock is open to pass navigation traffic 20 hours-a-day, 365 days a year. The lock is closed between the hours of 2 and 6 a.m. daily.

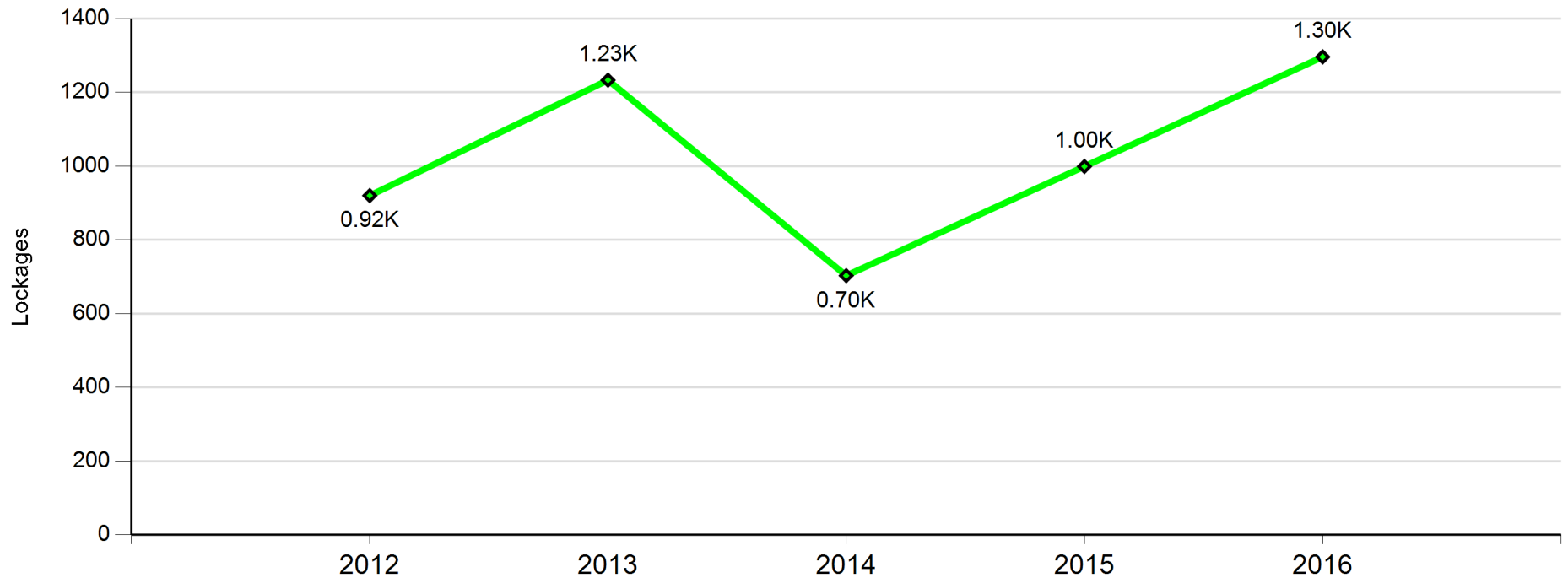
Barkley Lock is named for Alben W. Barkley. Alben Barkley was born in Graves County in Western Kentucky in 1877. He began practicing Law in Paducah, Kentucky in 1901. In 1913, he was elected to Congress, where he served until 1927. He was elected to the Senate in 1927 and served until 1948 when he was elected Vice President of the United States on the Democratic ticket with Harry S. Truman. After leaving the Vice Presidency in 1953, he returned to the U.S. Senate in 1955 where he served until his death in 1956.

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## Annual Number of Commercial Lockages

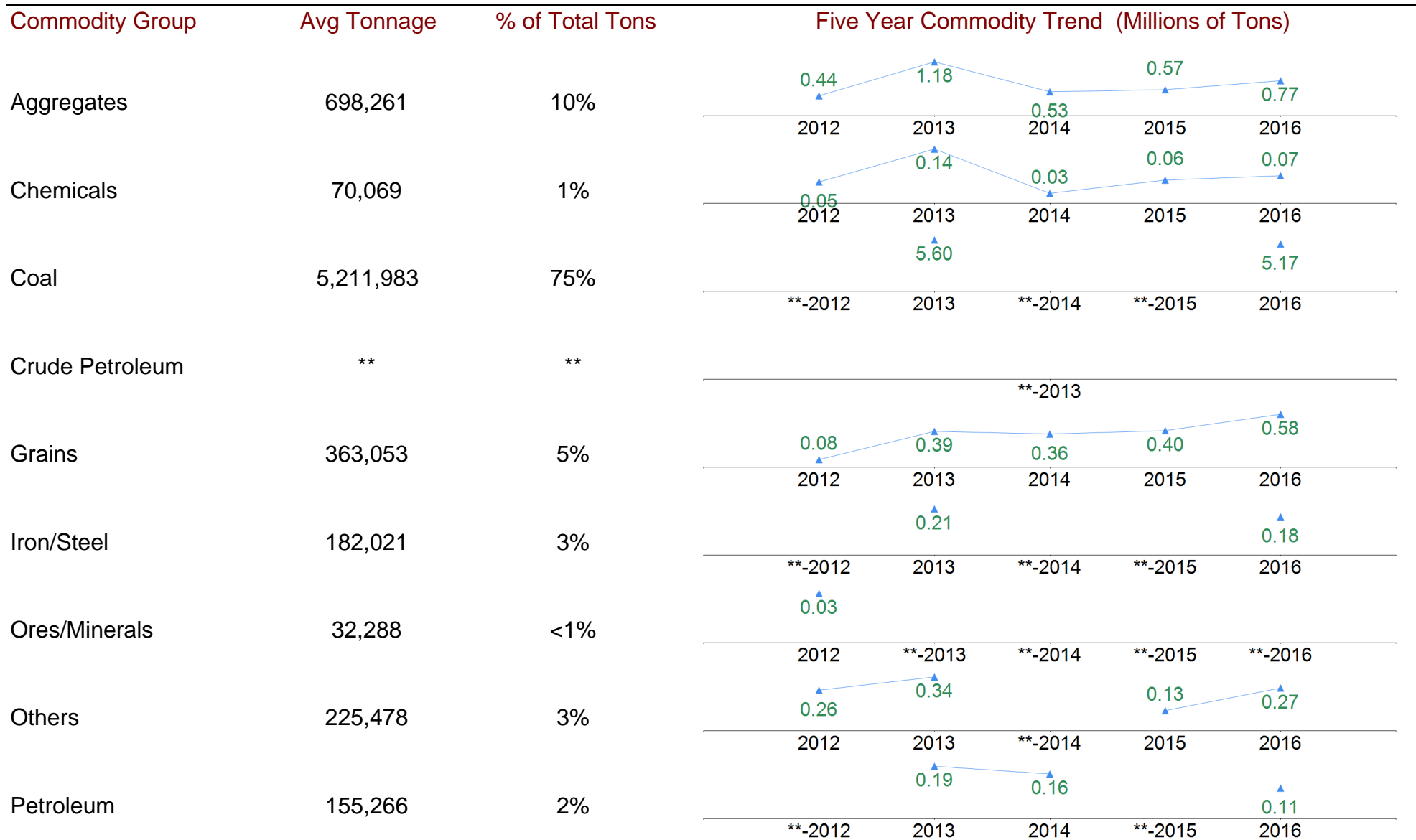


Source: LPMS

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\*\*Year = Insufficient Operators to Release Tonnage

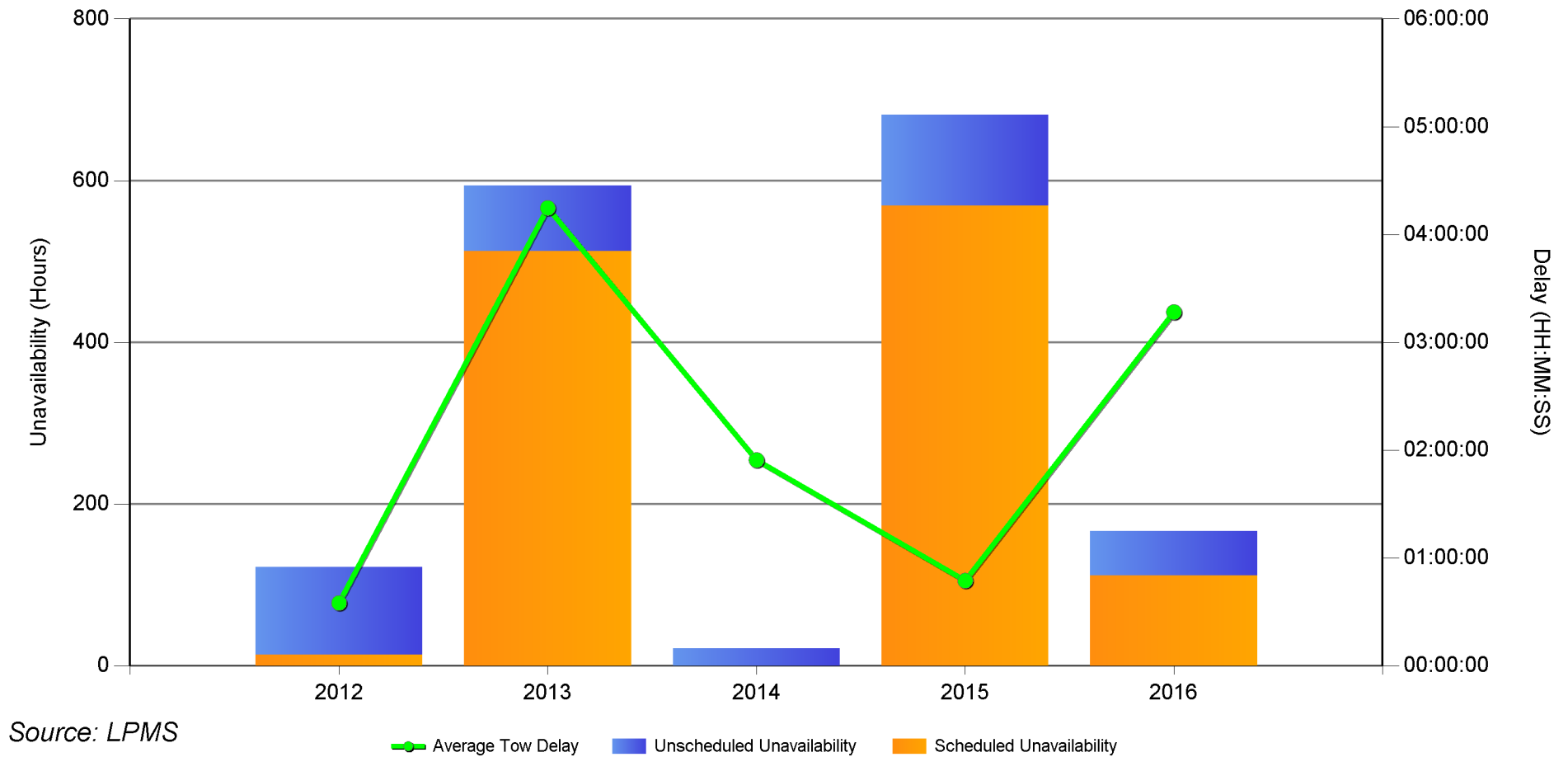
Source: Waterborne Commerce Statistics

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## Barkley L&D Unavailability and Delay



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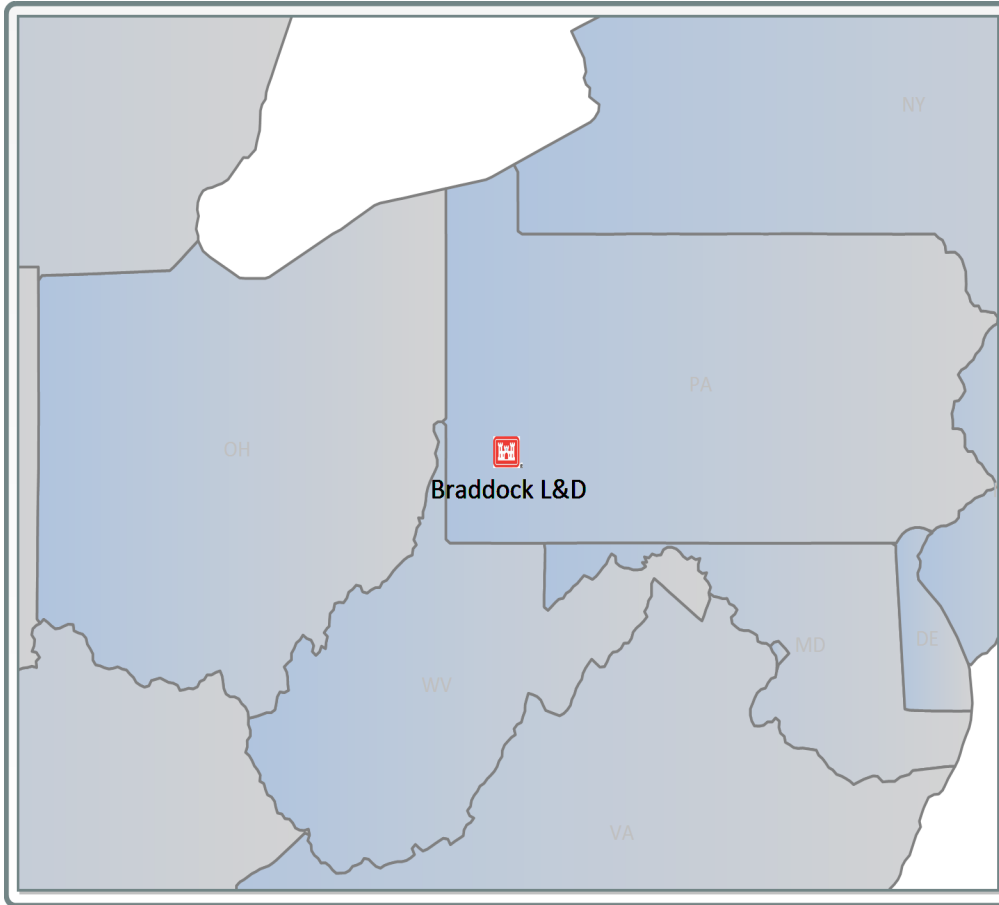


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# Braddock L&D

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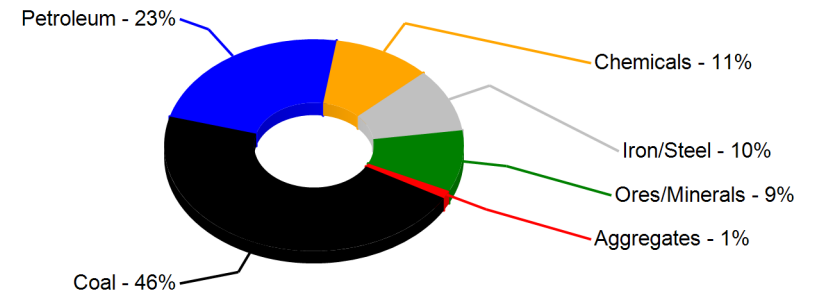


## 2016 Quick Facts

Commercial Lock Operations - 2,687	National Rank - 60
Short Tons (Thousands) - 11,106	National Rank - 69
Commodity Value (Millions) -	Unable to Release
Average Tow Delay (HH:MM:SS) -	00:20:17

Source: Lock Performance Monitoring System (lockages and Tons), 2012 NDSU  
Commodity Value Study (Commodity Value), Waterborne Commerce Statistics  
(Commodity Tonnage Below)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study,  
indexed to 2016 price level (Commodity dollar values are not calculated for foreign  
movements)

\*\* Remaining 0.31% Unable to release due to insufficient operators

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## Lock Information

### Location:

Braddock Locks and Dam is one of nine navigation structures which provide for year-round navigation on the Monongahela River between Pittsburgh, PA and Fairmont, West Virginia. It maintains a pool for 12.6 miles upstream to Locks and Dam 3 at Elizabeth, PA.

Braddock Locks and Dam is located at Monongahela River mile 11.2 at the city of Braddock, PA. The lock chambers and operations buildings are situated along the right bank of the river adjacent to a major steel-making plant. Road access to the project is from 11th Street in Braddock.

### History:

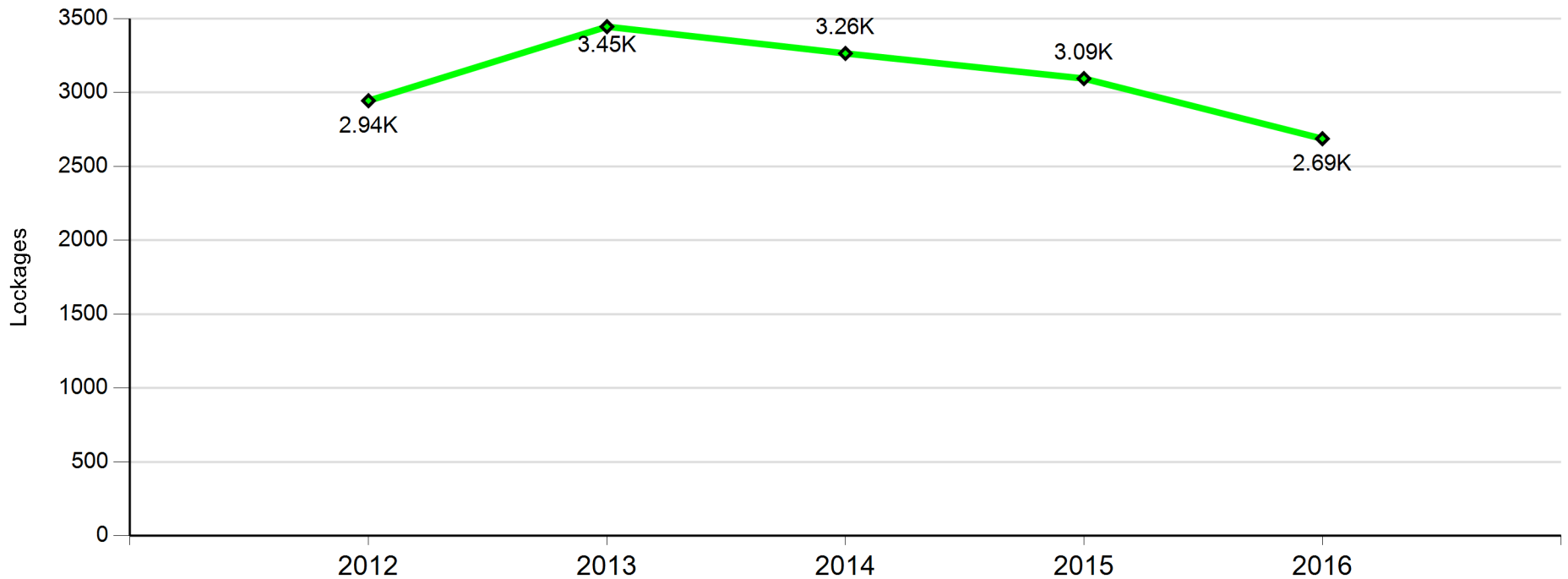
Construction of Locks and Dam 2 at this present site was begun in 1902 and completed in 1906. After some 40 years of use, a major rehabilitation of the project was completed in 1953. This work involved reconstruction and enlargement of the lock chambers and adjustment of the length of the dam.

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## Annual Number of Commercial Lockages



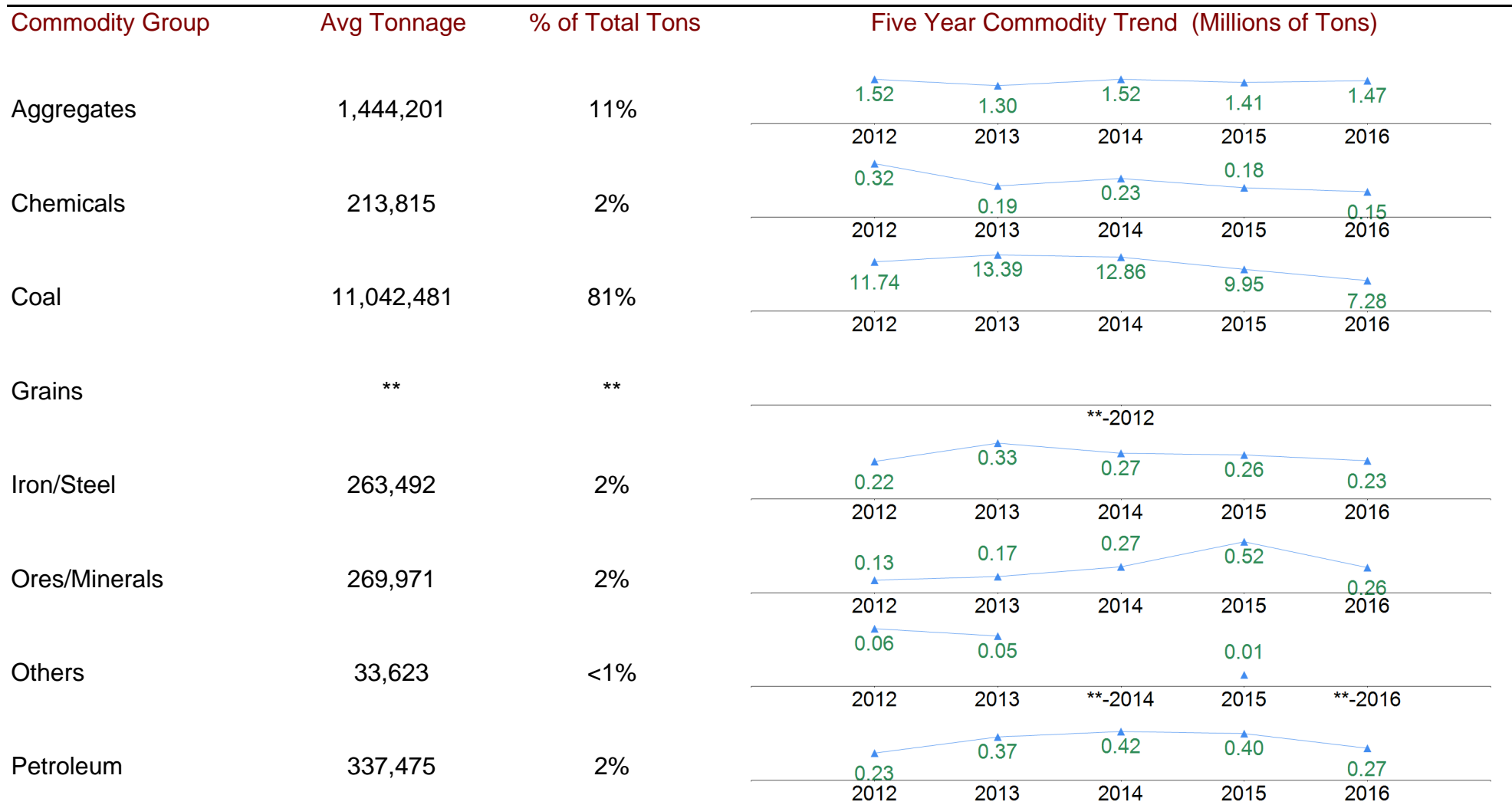
Source: LPMS

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\*\* - Year = Insufficient Operators to Release Tonnage

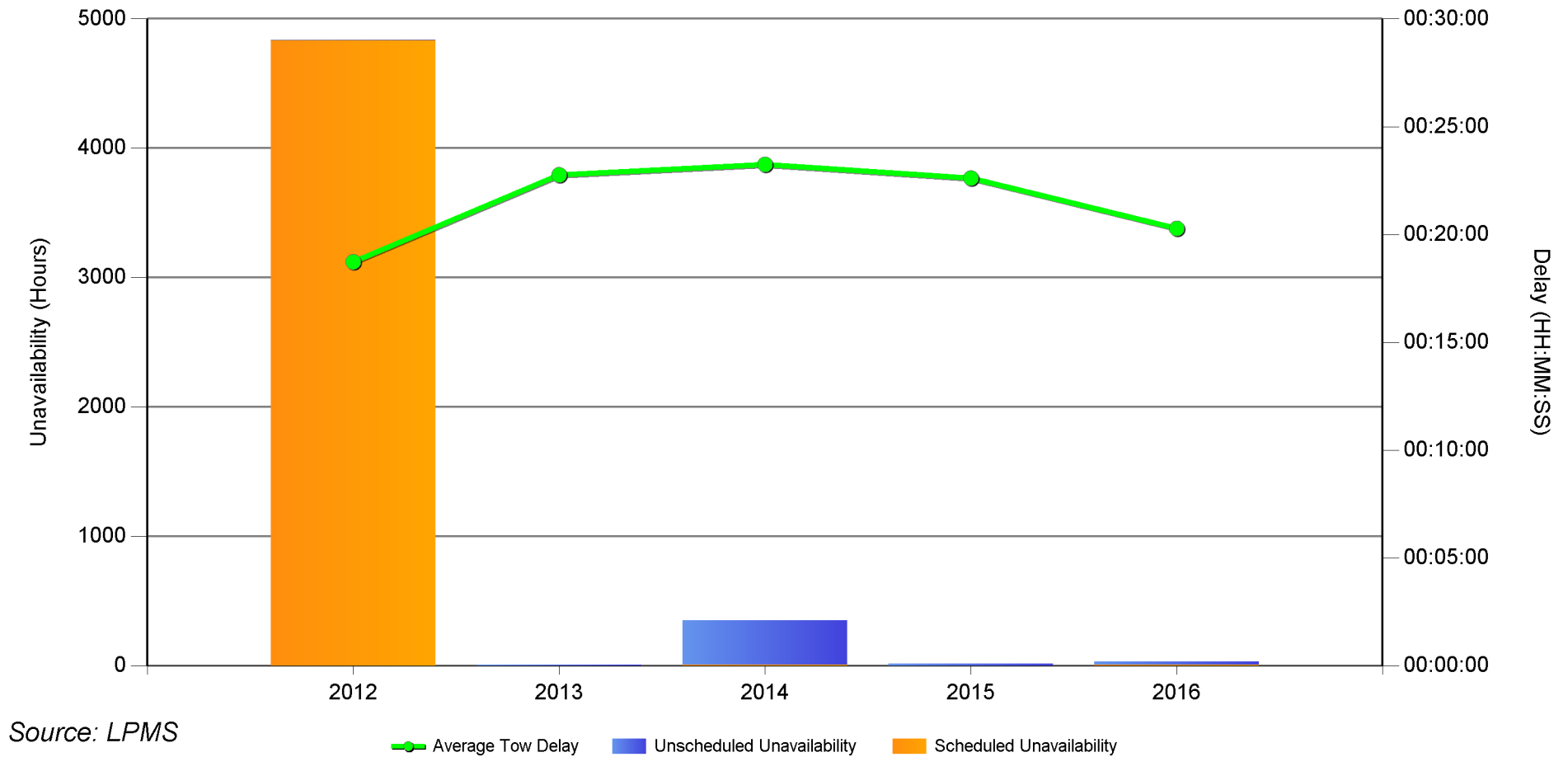
Source: Waterborne Commerce Statistics

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## Braddock L&D Unavailability and Delay



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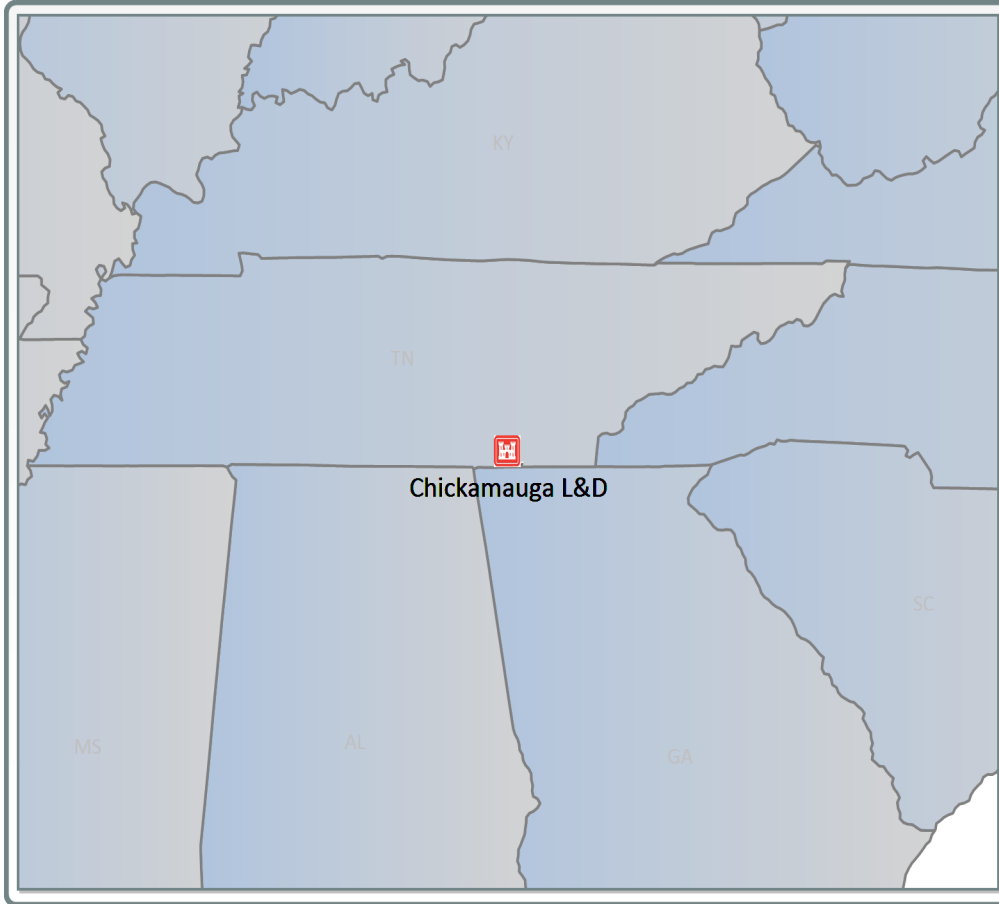


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# Chickamauga L&D

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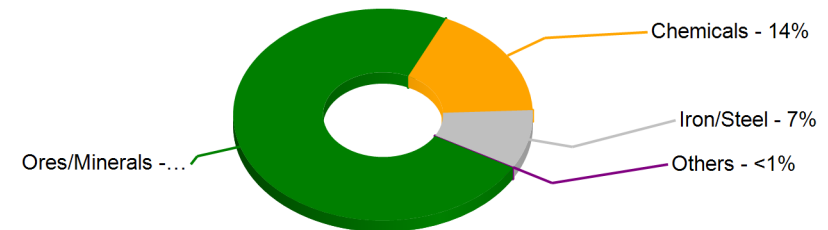


## 2016 Quick Facts

Commercial Lock Operations -	830	National Rank -	131
Short Tons (Thousands) -	825	National Rank -	135
Commodity Value (Millions) -			\$378.50
Average Tow Delay (HH:MM:SS) -			01:18:08

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

\*\* Remaining 19.51% Unable to release due to insufficient operators

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## Lock Information

### Location

Chickamauga Lock is located at Tennessee River mile 471 only 6.9 miles above Chattanooga, Tennessee. It is 58.9 river miles downstream of Watts Bar Lock and 46.3 miles upriver from Nickajack Lock.

### Lock History

TVA commenced preliminary investigation for the Chickamauga project during May 1935, and the Board of Directors authorized its construction on Dec. 31, 1935. Construction of the Chickamauga project started in Jan. 13, 1936 and was opened to navigation in 1939.

The name Chickamauga came from a warlike tribe of Chickamauga Indians, who had separated from the main body of the Cherokee Indians. The band was a mix of Cherokee and Creek warriors, white fugitives, and some African Americans who collectively took the name Chickamauga. The Chickamauga lived in a village nearly a mile in length on Chickamauga Creek several miles above the mouth. According to Mr. John P. Long in his history of Hamilton County, Chickamauga means dull, sluggish stream.

### Concrete Growth

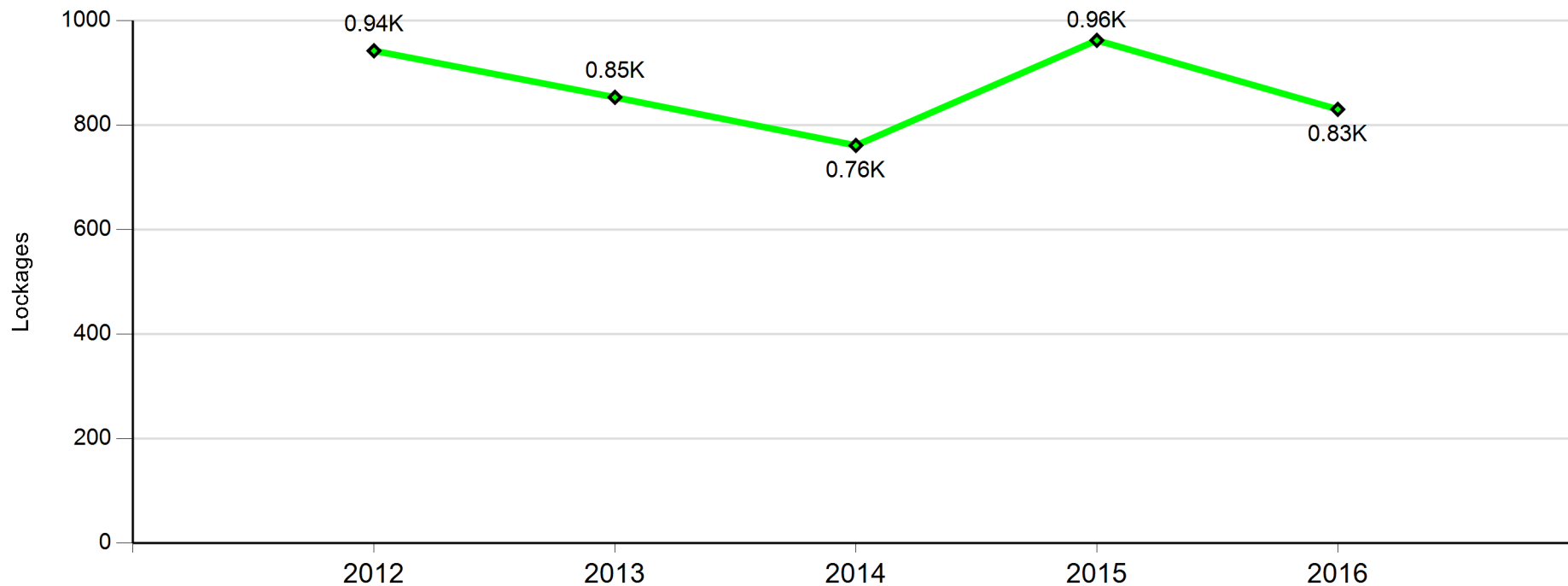
Chickamauga Lock has growing concrete in its structure, which is a reaction between the alkali in the cement and the minerals in the stone. This growing concrete has brought many problems – in some places large chunks of concrete have broken loose from the lock walls – and because the massive blocks that make up the lock have expanded at different rates, the top of the structure is uneven. Lengthwise, the lock has actually grown five inches inside the lock chamber. The approach walls have grown even more. Corps of Engineers and TVA working together continues making temporary repairs to the project spending large maintenance dollars. Corps and TVA have determined that Chickamauga Lock does have a finite life.

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## Annual Number of Commercial Lockages

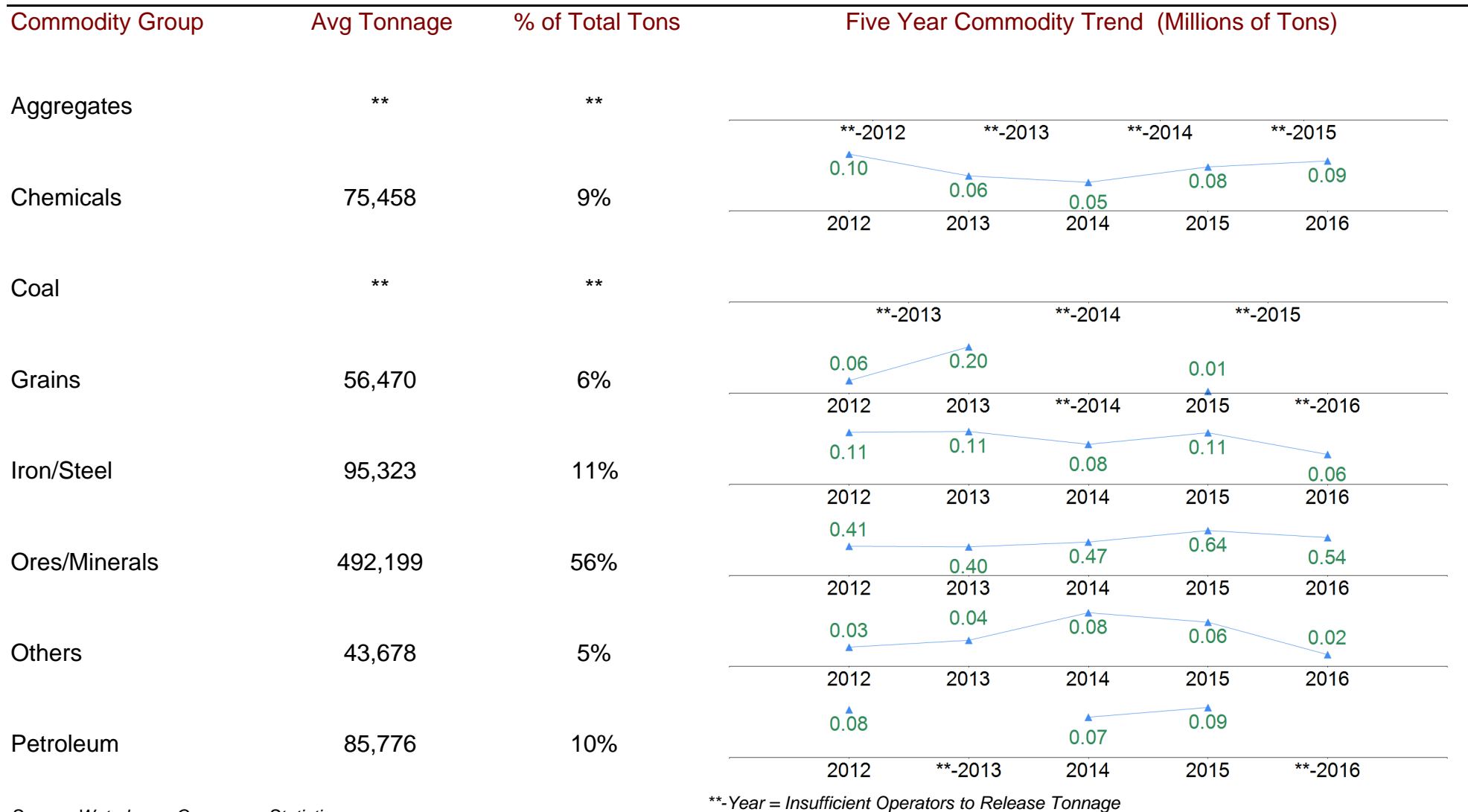


Source: LPMS

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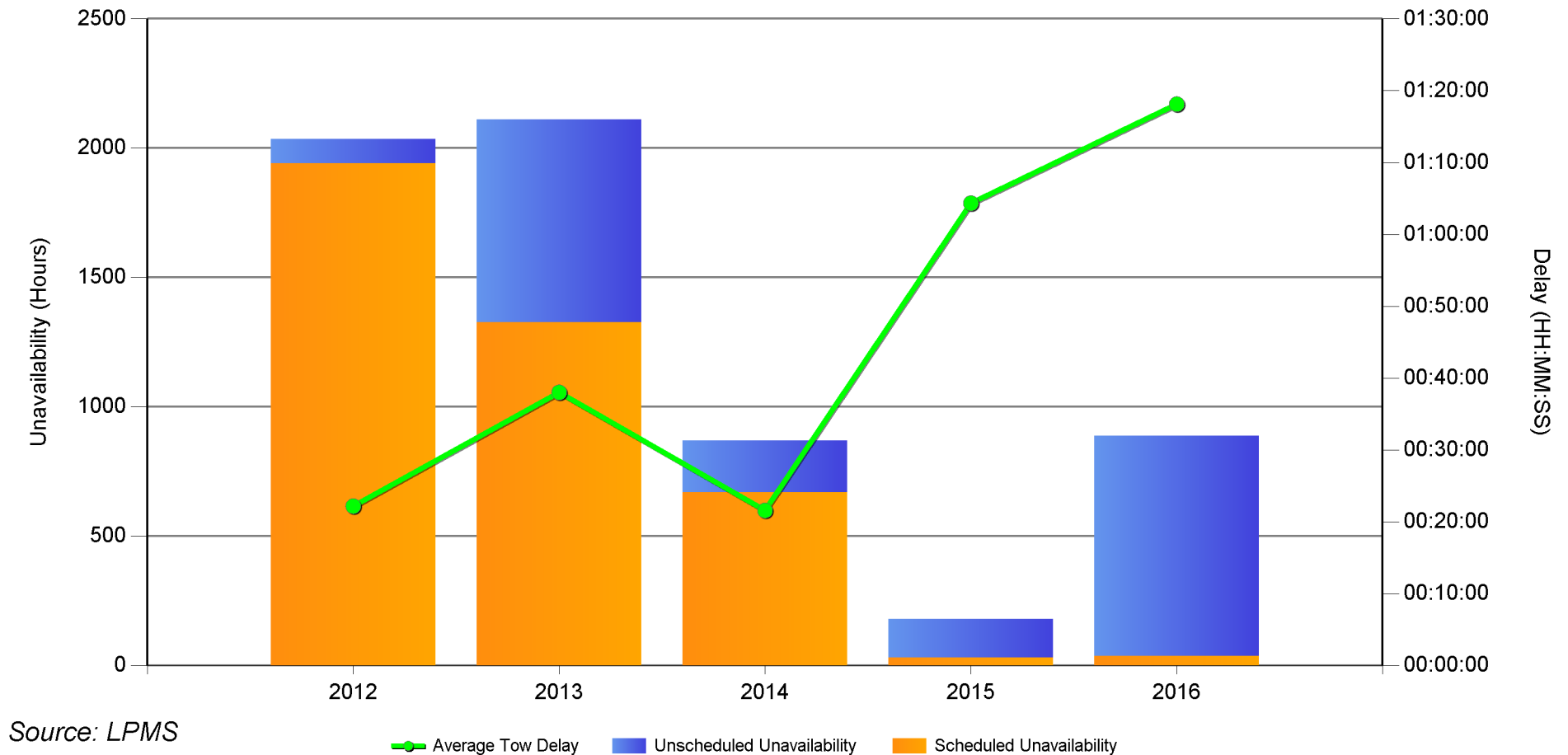
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Source: Waterborne Commerce Statistics

## Chickamauga L&D Unavailability and Delay



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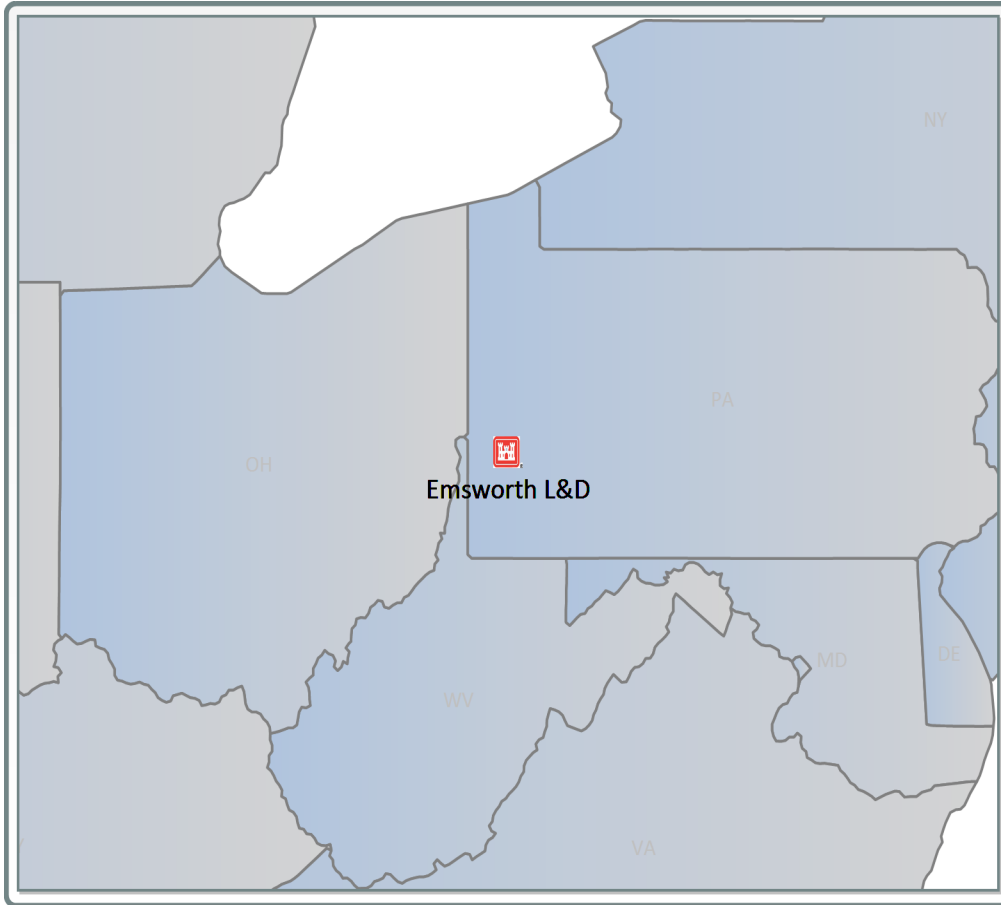


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# Emsworth L&D

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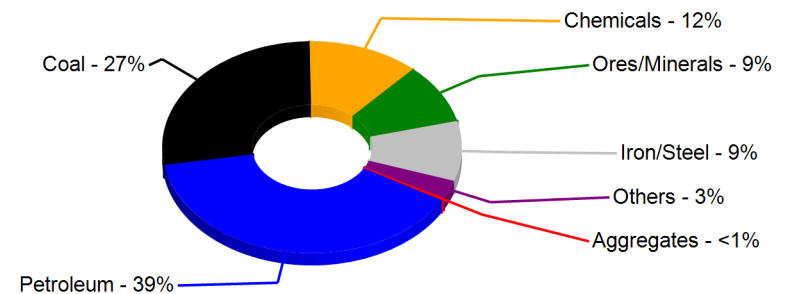


## 2016 Quick Facts

Commercial Lock Operations - 3,457	National Rank - 45
Short Tons (Thousands) - 9,677	National Rank - 68
Commodity Value (Millions) -	\$1,714.10
Average Tow Delay (HH:MM:SS) -	01:40:59

*Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)*

## 2016 Commodity Value Distribution



*Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)*

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## Lock Information

### Location:

Emsworth Locks and Dam's main channel dam is located at river mile 6 near the towns of Emsworth, Avalon and Ben Avon, PA.

### History:

The locks first opened in September 1921. The Corps rebuilt and converted the dam to a gate structure between 1935 and 1938. This action raised the pool an additional 7 feet to accommodate larger, more modern barges. From 1981-86, some \$30 million was invested in a major rehabilitation of the facility. Rehabilitation included the replacement of electrical systems, operating machinery and buildings and re-surfacing of the lock walls.

### Project Information

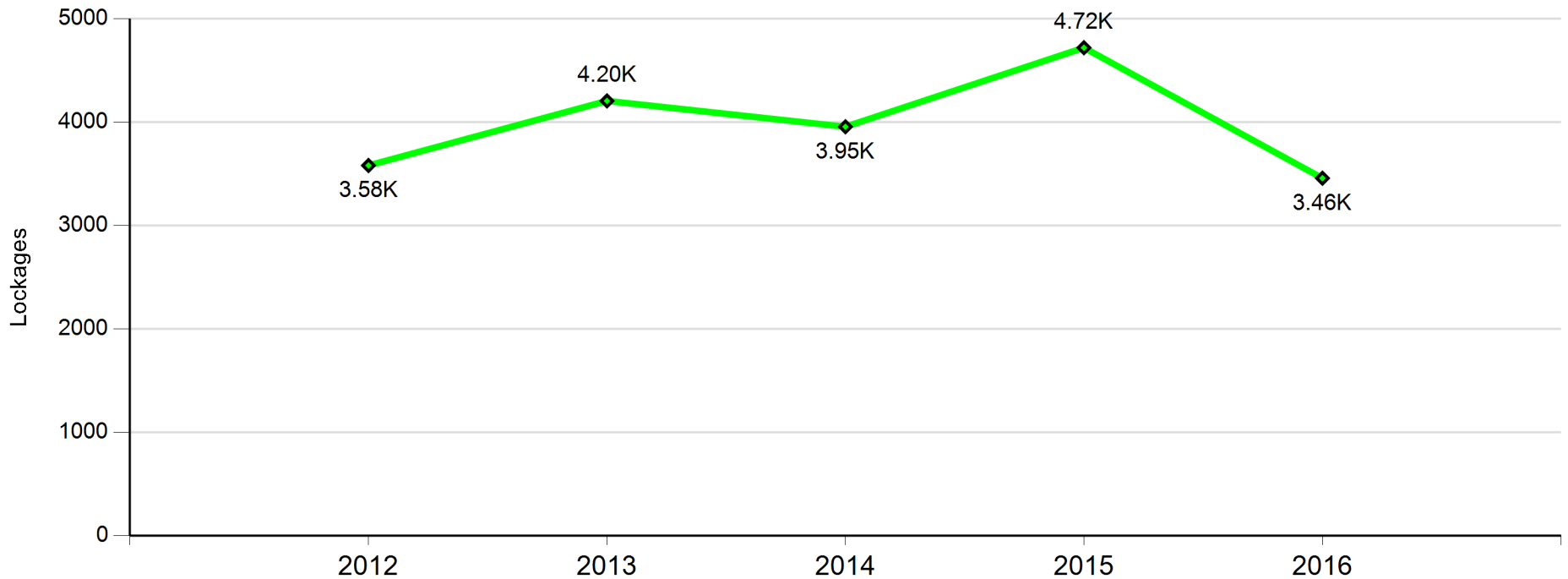
The Emsworth project consists of two gated dams, one of the two major types in service in the Pittsburgh District. Gated dams are constructed to permit increased control over the water level in the navigation pool upriver of the dam. Machinery mounted on tall concrete piers moves large chains which lift gates that are hinged into the body of the piers. As the gates are raised or lowered to control the amount of water flowing under them, the upstream pool is maintained at a relatively constant level for an authorized depth of at least 9 feet throughout its length. The dam, however, cannot be operated to control flood flows. An incidental benefit derived from the pool formed by the dam is the availability of a source of municipal and industrial water.

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## Annual Number of Commercial Lockages

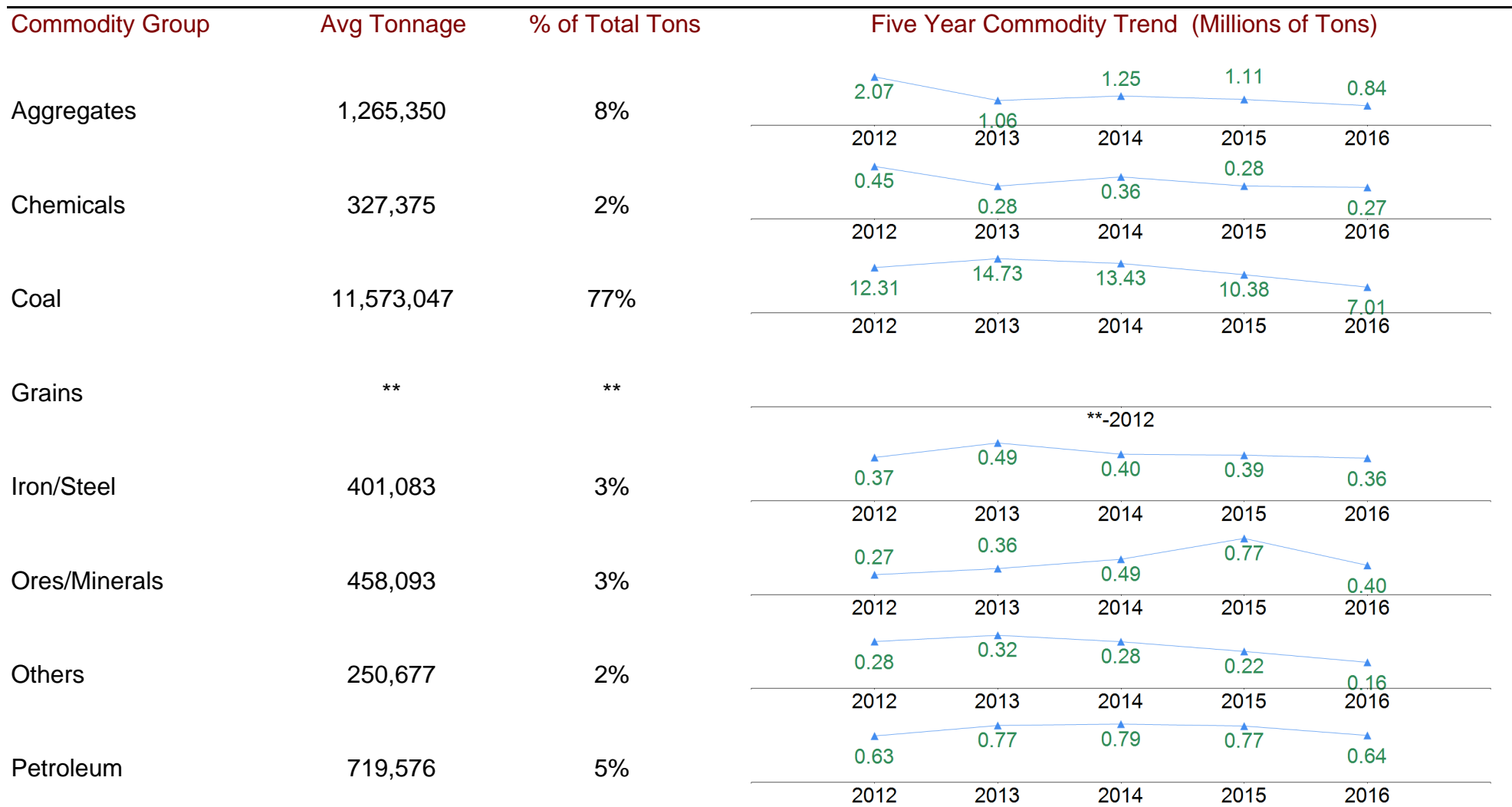


Source: LPMS

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\*\* - Year = Insufficient Operators to Release Tonnage

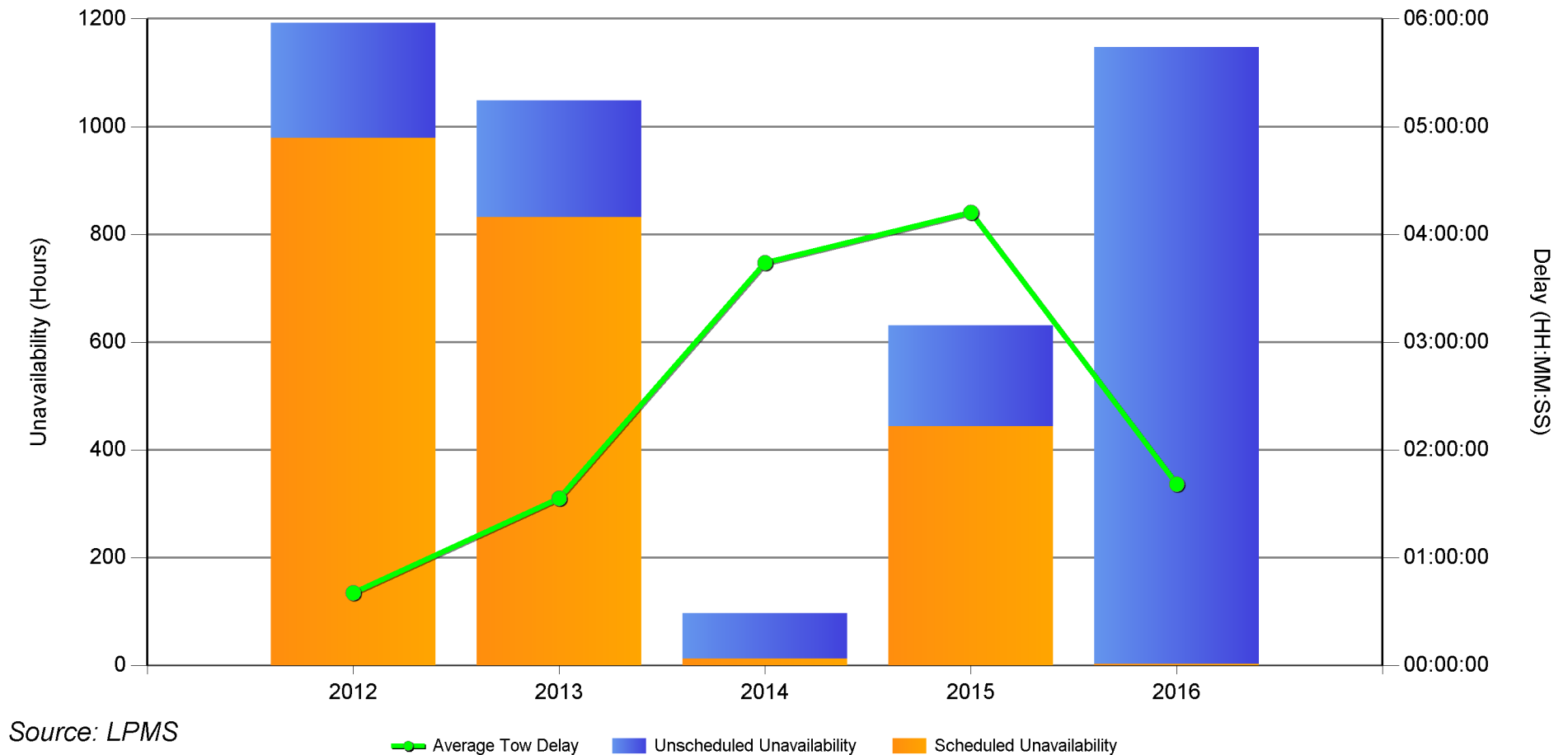
Source: Waterborne Commerce Statistics

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## Emsworth L&D Unavailability and Delay



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# Inner Harbor Lock

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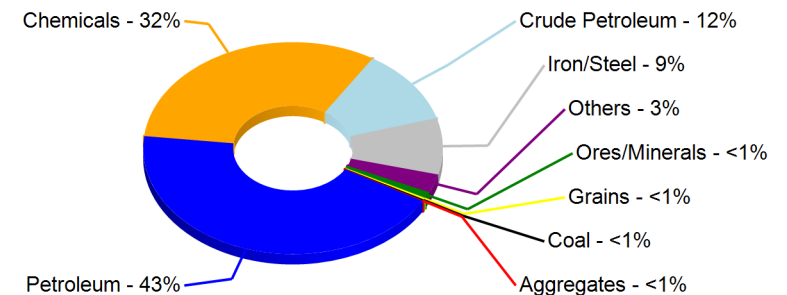


## 2016 Quick Facts

Commercial Lock Operations - 5,355	National Rank - 19
Short Tons (Thousands) - 10,378	National Rank - 62
Commodity Value (Millions) -	\$7,834.49
Average Tow Delay (HH:MM:SS) -	17:01:09

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

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## Lock Information

### Location

The IHNC Lock is located in the Industrial Canal which runs through a highly urbanized area within the New Orleans city limits. It joins Lake Pontchartrain to the north with the Mississippi River to the south. The canal also connects the eastern segment of the Gulf Intracoastal Waterway (GIWW) with the Mississippi River.

On January 6, 2017, the U.S. Army Corps of Engineers released the “Mississippi River, Baton Rouge to the Gulf of Mexico Mississippi River-Gulf Outlet, Louisiana, New Industrial Canal Lock and Connecting Channels Project Draft Integrated General Reevaluation Report (GRR) and Draft Supplemental Environmental impact Statement (SEIS)” for public review.

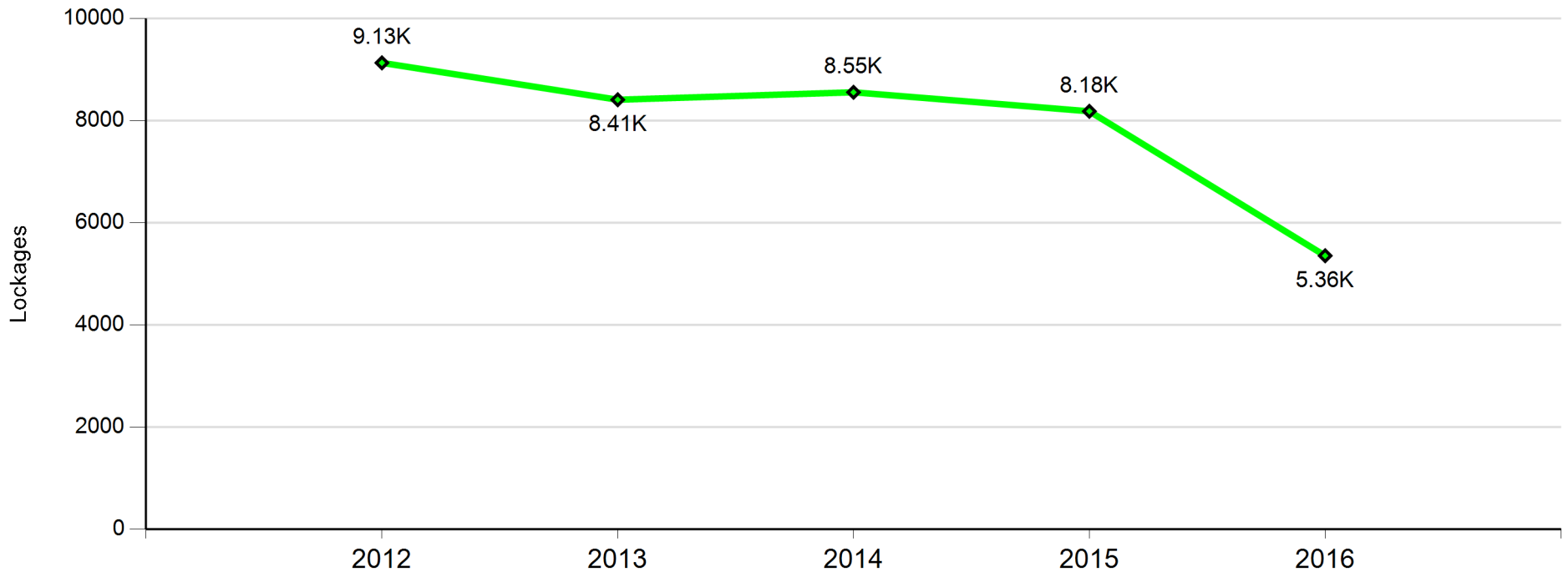
In addition to documenting significant changes in the area since the initial feasibility study and environmental impact statement was completed in 1997, this report proposes replacement of the 95 year-old Inner Harbor Navigation Canal (IHNC) lock with a new lock. The draft tentatively selected plan proposes replacement of the existing lock with a new shallow-draft lock having usable dimensions of 900 feet long by 110 feet wide by 22 feet deep to be constructed between the banks of the IHNC, north of the existing lock.

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## Annual Number of Commercial Lockages



Source: LPMS

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Source: Waterborne Commerce Statistics

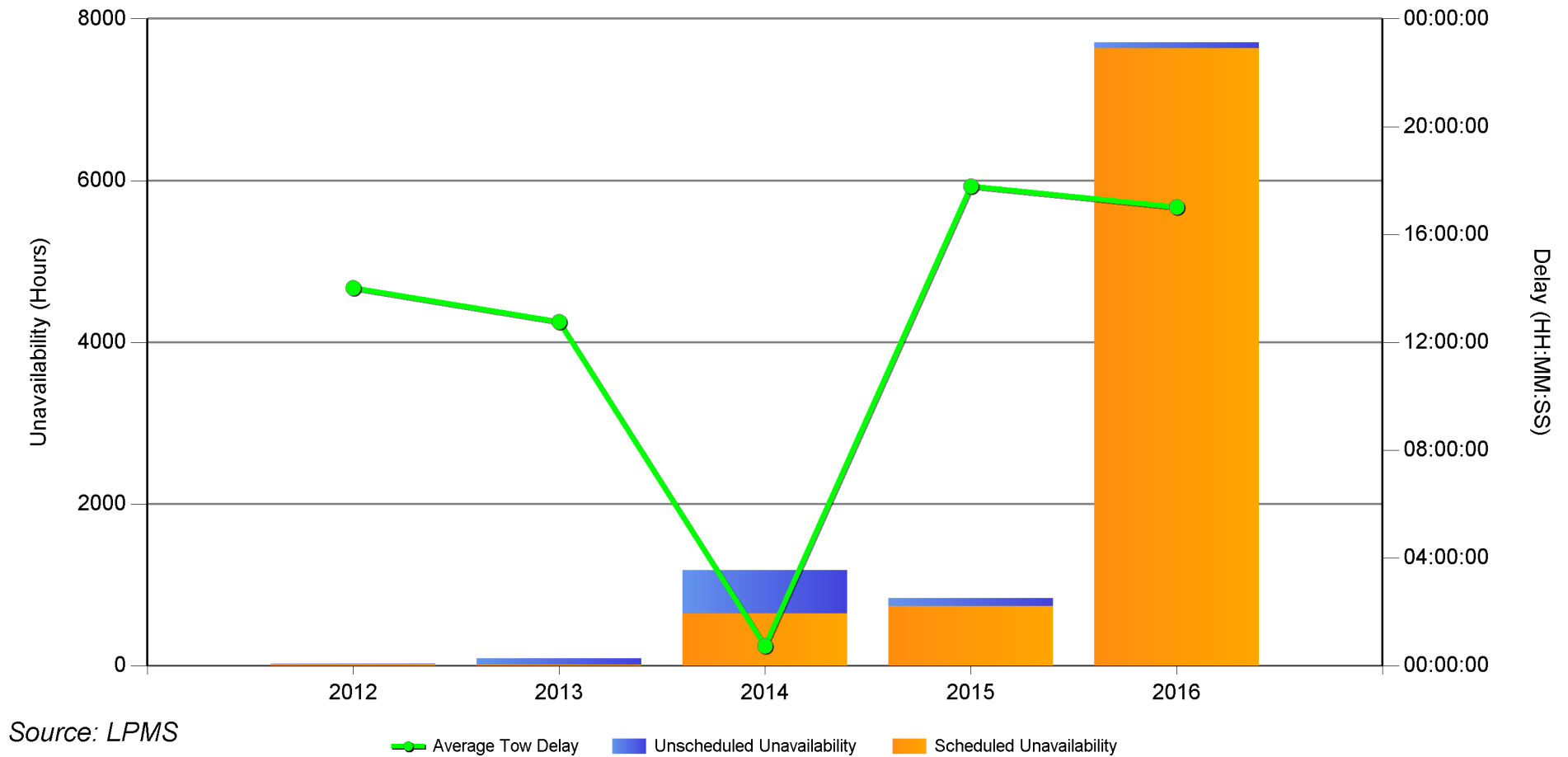
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## Inner Harbor Lock Unavailability and Delay



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# Kentucky L&D

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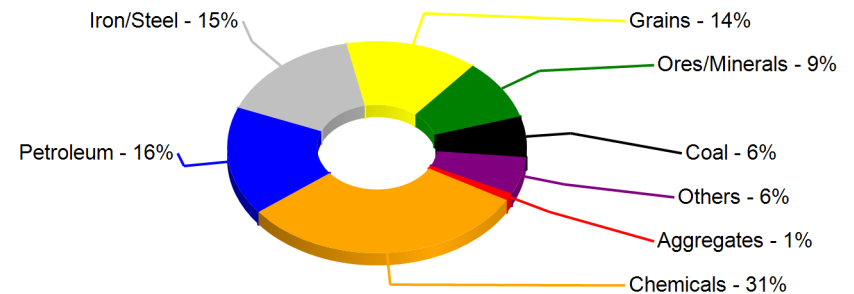


## 2016 Quick Facts

Commercial Lock Operations - 4,399	National Rank - 27
Short Tons (Thousands) - 24,934	National Rank - 31
Commodity Value (Millions) -	\$6,026.97
Average Tow Delay (HH:MM:SS) -	09:28:19

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

\*\* Remaining 2.16% Unable to release due to insufficient operators

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## Lock Information

### Location

Kentucky Lock is located near Gilbertsville, Kentucky, 22.4 miles from the confluence of the Tennessee and Ohio Rivers. It is 20 miles east of Paducah, Kentucky.

The 184-mile reservoir created by Kentucky Dam stretches across parts of Tennessee and Kentucky and is the largest in the Eastern U.S.

### Lock History

Construction on Kentucky Lock was begun in 1935. In 1942, the lock was finished by TVA and put into operation.

### More About Kentucky Lock and Dam

Kentucky Lock is the lower gateway to more than 700 miles of navigable waters in the Tennessee River Basin. The access it affords to the Barkley Canal connects the Tennessee with more than 300 miles of water in the Cumberland River Basin.

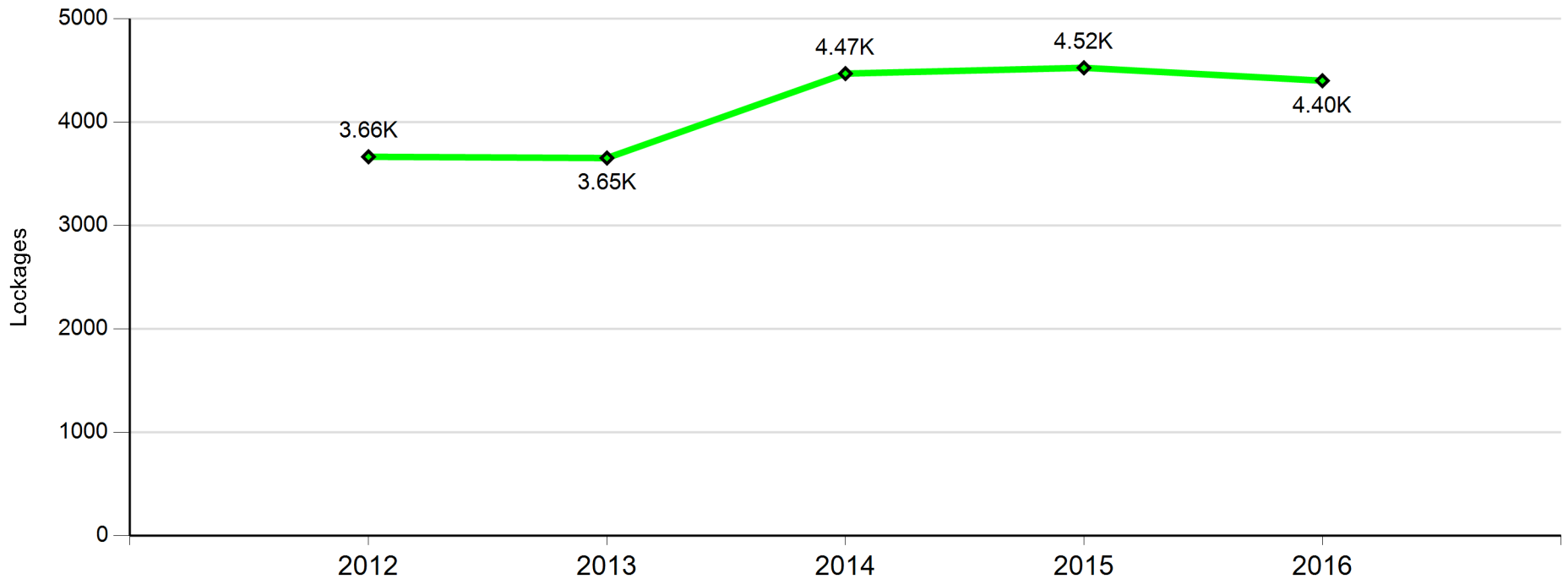
Due to geological conditions in the area, more than half of the completed structure is submerged. The depth to foundation rock is so great that, on the west abutment wall, only 90 feet of the 206 foot high structure is visible.

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## Annual Number of Commercial Lockages



Source: LPMS

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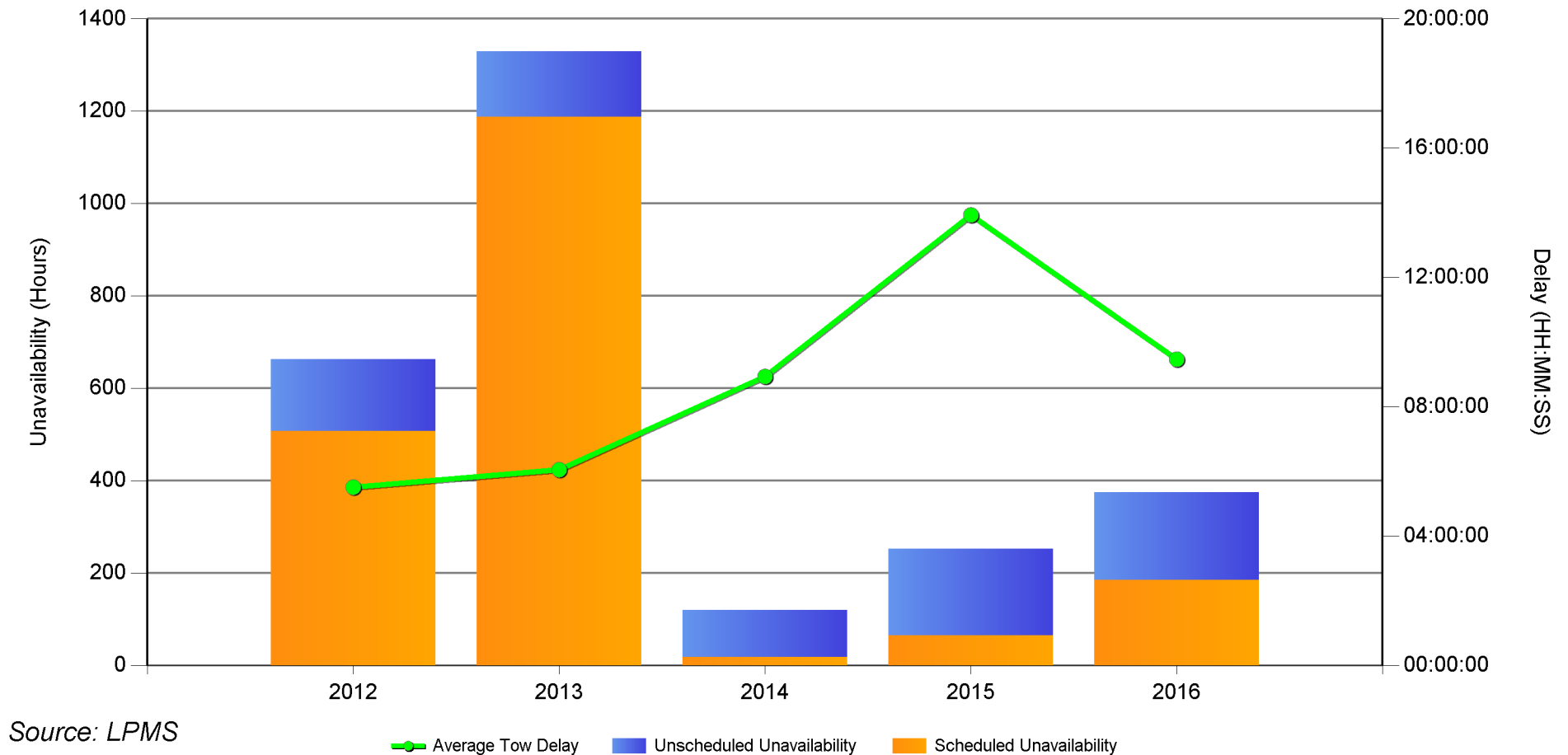
Source: Waterborne Commerce Statistics

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## Kentucky L&D Unavailability and Delay



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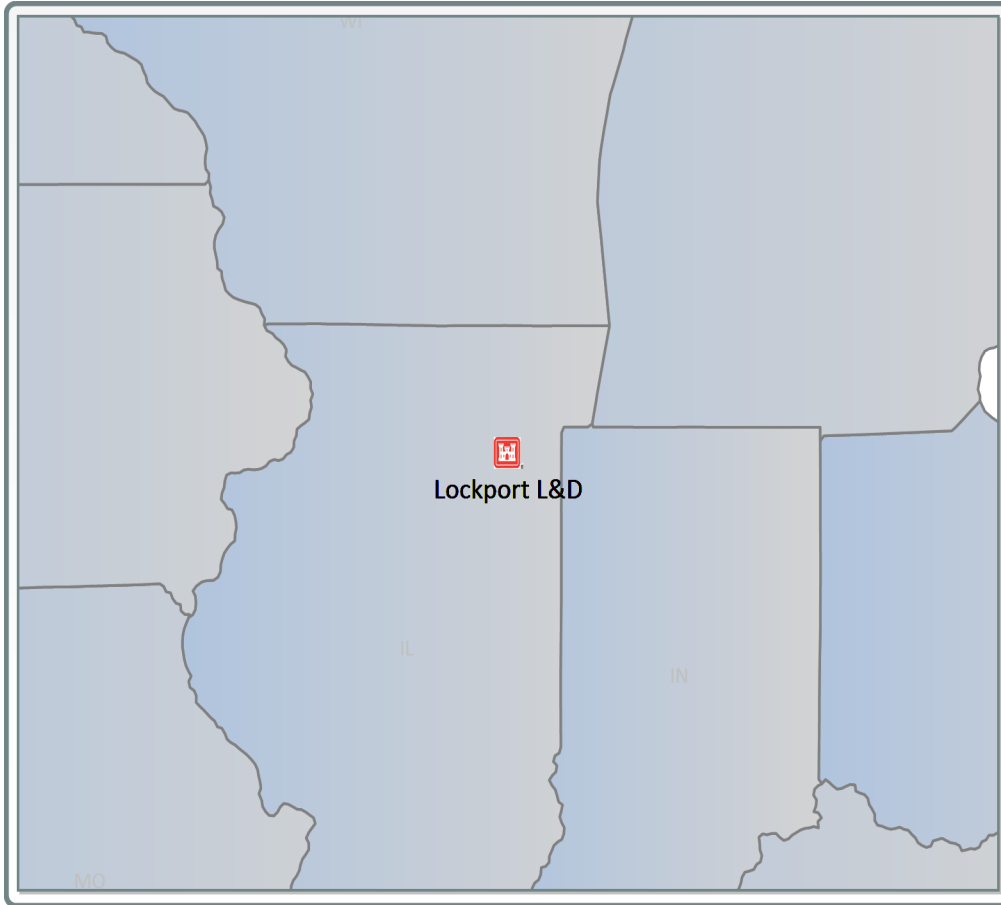


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# Lockport L&D

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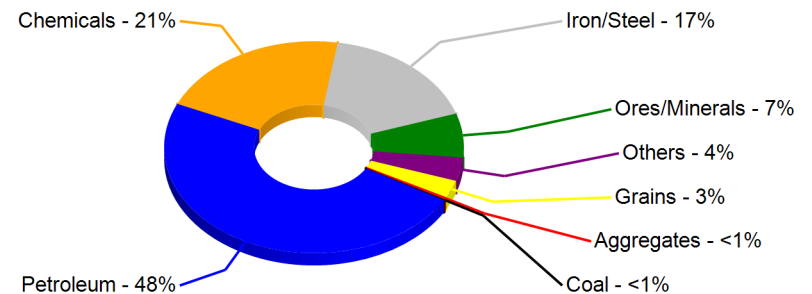


## 2016 Quick Facts

Commercial Lock Operations - 2,948	National Rank - 57
Short Tons (Thousands) - 10,318	National Rank - 63
Commodity Value (Millions) -	\$4,067.90
Average Tow Delay (HH:MM:SS) -	00:52:51

*Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)*

## 2016 Commodity Value Distribution



*Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)*

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## Lock Information

Lockport Lock and Dam is 291.0 miles above the confluence of the Illinois River with the Mississippi river at Grafton, Illinois. The complex is two miles southwest of the city of Lockport, Illinois.

The lock is 110 feet wide by 600 feet long. Maximum vertical lift is 42.0 feet, the average lift is 39 feet. It averages 22.5 minutes to fill the lock chamber; 15 minutes to empty.

The Lockport Dam consists of the Metropolitan Water Reclamation District of Greater Chicago (MWRD) lock, powerhouse and associated controlling works. The MWRD, through Congressional action, transferred the maintenance responsibilities of the substructures and support structures to the Corps in the early 1980s for the roughly forty-five foot high embankment, controlling works, powerhouse substructures, and all pool retention structures. The Corps controls the lock; however, has no ownership of the controlling works.

Rehabilitation of the lock was completed in 1989 at a cost of \$22,681,000.

The lock opened in 1933. Lockport Lock was one of five designed and partially constructed by the state of Illinois over a period from 1923 to 1930. The complex was about 97 percent complete when construction was turned over to the federal government due to state financial difficulties. The government, by the authority of the Rivers and Harbors Act of 1930, completed construction of the lock in 1933.

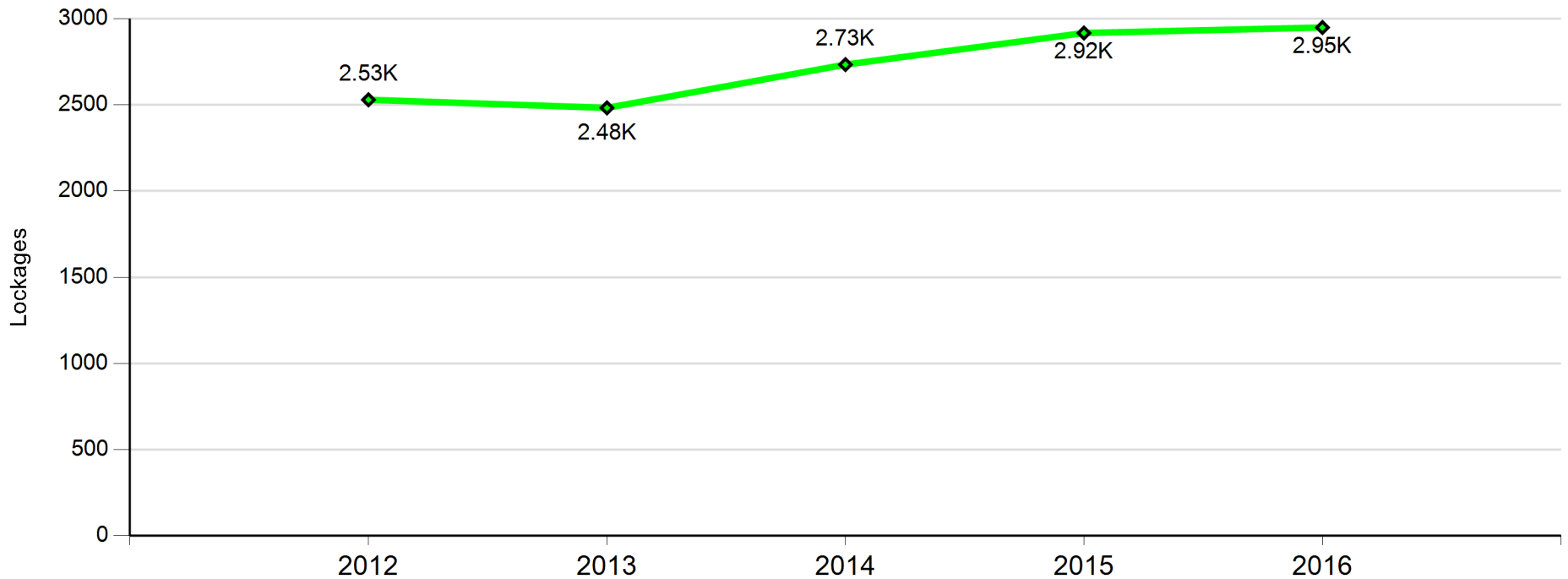
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## Annual Number of Commercial Lockages



Source: LPMS

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\*\* - Year = Insufficient Operators to Release Tonnage

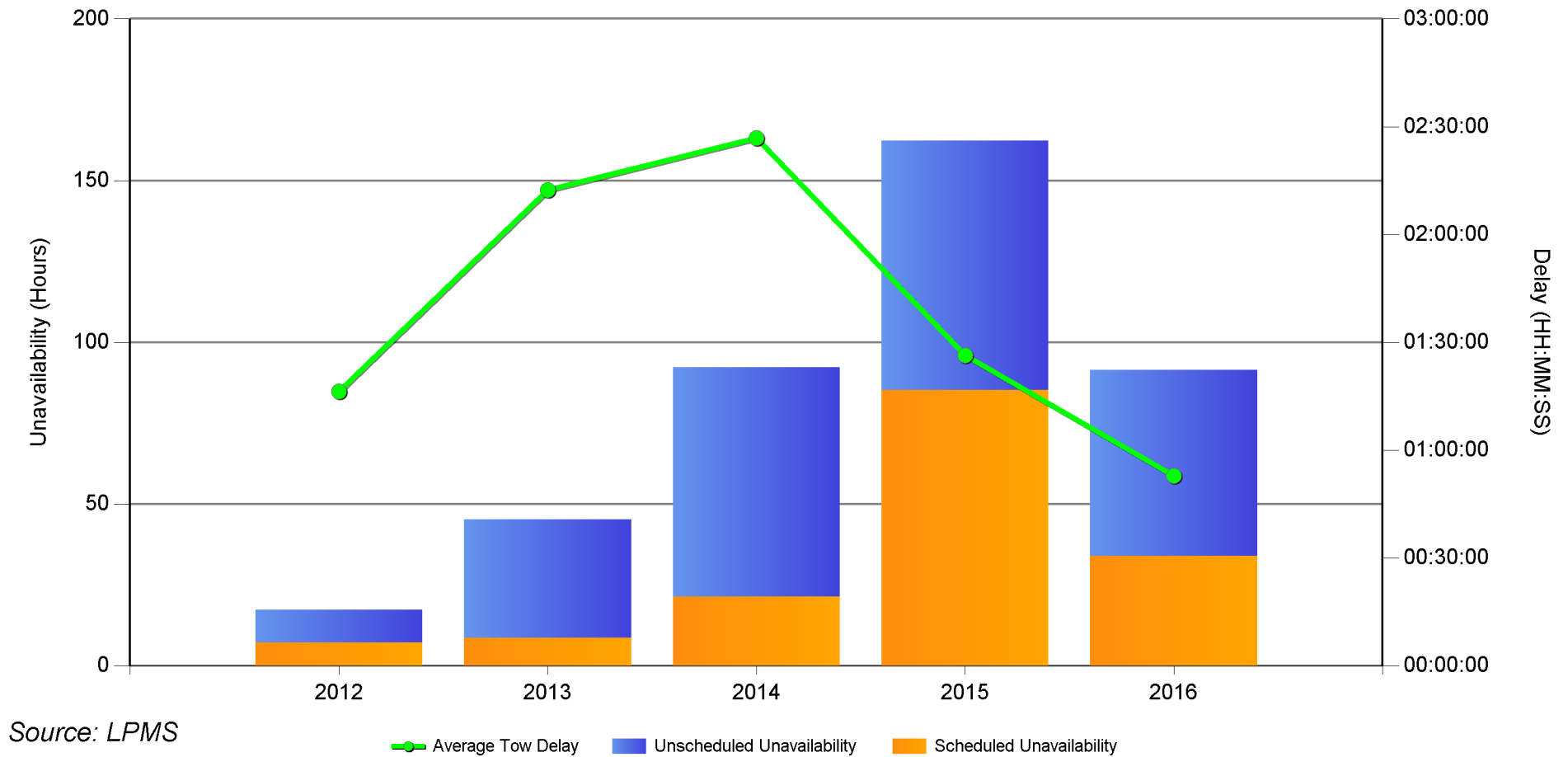
Source: Waterborne Commerce Statistics

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## Lockport L&D Unavailability and Delay



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# Mississippi L&D 27

BUILDING STRONG ®

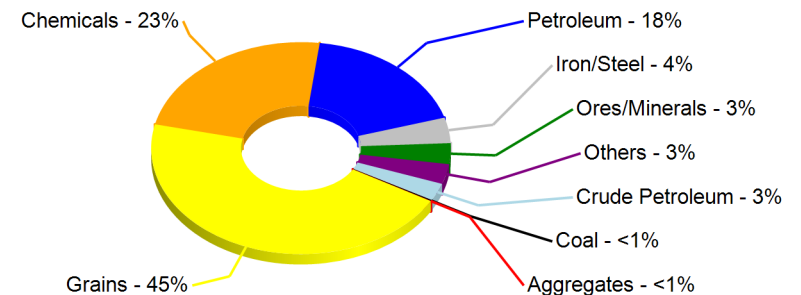


## 2016 Quick Facts

Commercial Lock Operations - 6,971	National Rank - 11
Short Tons (Thousands) - 70,015	National Rank - 1
Commodity Value (Millions) -	\$32,776.75
Average Tow Delay (HH:MM:SS) -	02:24:36

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

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## Lock Information

### Location:

Mississippi Locks and Dam 27 locks are located at Mississippi River mile 185.5 near the southern end of the 8.4-mile long Chain of Rocks Canal. The dam is located at Mississippi River mile 190.2 immediately downstream from Homer Dike, Intake Towers 1 and 2 of the St. Louis Water Works, the Chain of Rocks Highway Bridge, and the Interstate Highway 270 Bridge. Its 489-acre pool (canal) is 15.6 miles long.

### History:

The canal and locks were put into operation on February 7, 1953. Locks and Dam 27 is unique for several reasons. Constructed between 1946 and 1953, these locks are the only locks on the upper Mississippi River that are not directly attached to their respective dam. The dam is located several miles away on the river, whereas the locks are within the Chain of Rocks Canal. The dam itself is also unlike any other dams in the system. All other dams were built to be moveable, so they could be adjusted according to the changing water level. Dam 27 is not so complex; it is a 2,500-foot non-movable, low-water, fixed-crest rock dam extending across the river and designed to provide additional water depth at the lower gate sills of Lock 26. Constructed between 1959 and 1964, the dam has virtually no impact upon operations within the Chain of Rocks Canal or at Locks 27. The locks are the last on the upper Mississippi River, therefore more cargo moves through its lock than any other navigation structure on the River.

Locks and Dam 27 is the last lock and dam system of 29 on the Upper Mississippi River that provide a water stairway of travel for commercial and recreational traffic from Minneapolis to the Gulf of Mexico. There are more than 580 manufacturing facilities, terminals, grain elevators, and docks that ship and receive tonnage in the Upper Mississippi River basin. Grains (corn and soybeans) dominate traffic on the system. Other commodities, mainly cement and concrete products, comprise the second largest group. A modern 15-barge tow transports the equivalent of 1,050 large semi-trucks (26,250 cargo tons, 875,000 bushels, or 17,325,000 gallons).

### Dimensions:

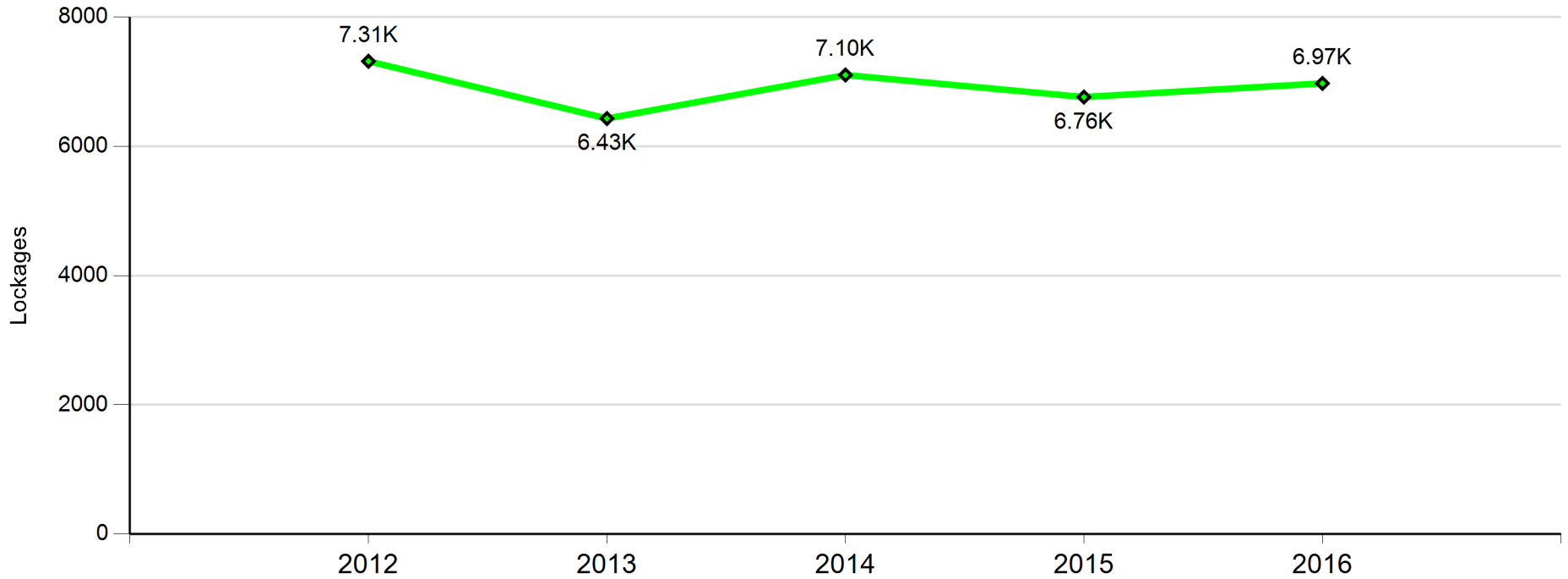
Locks and Dam 27 has twin locks, a main chamber and an auxiliary chamber. The main lock chamber is 1,200 feet long by 110 feet wide. The auxiliary chamber measures 600 feet long by 110 feet wide. Both locks were excavated to bedrock, which serves as the lock chamber floors. The dam is 2,500 feet in length and is a non-movable low-water dam which extends entirely across the river.

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## Annual Number of Commercial Lockages



Source: LPMS

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Commodity Group	Avg Tonnage	% of Total Tons	Five Year Commodity Trend (Millions of Tons)				
Aggregates	1,529,858	3%	1.57	1.58	2.15	1.46	0.89
			2012	2013	2014	2015	2016
Chemicals	9,596,861	16%	8.87	8.70	10.07	9.82	10.52
			2012	2013	2014	2015	2016
Coal	1,348,956	2%	2.06	1.51	1.28	1.04	0.85
			2012	2013	2014	2015	2016
Crude Petroleum	3,830,687	6%	4.79	5.62	4.78	2.59	1.37
			2012	2013	2014	2015	2016
Grains	27,981,248	46%	26.10	16.75	26.33	30.13	40.59
			2012	2013	2014	2015	2016
Iron/Steel	3,663,775	6%	3.89	3.19	4.16	3.90	3.18
			2012	2013	2014	2015	2016
Ores/Minerals	2,660,385	4%	2.13	2.20	3.69	2.92	2.36
			2012	2013	2014	2015	2016
Others	3,441,627	6%	3.51	3.08	3.45	3.57	3.59
			2012	2013	2014	2015	2016
Petroleum	6,604,295	11%	6.20	6.16	7.39	6.59	6.68
			2012	2013	2014	2015	2016

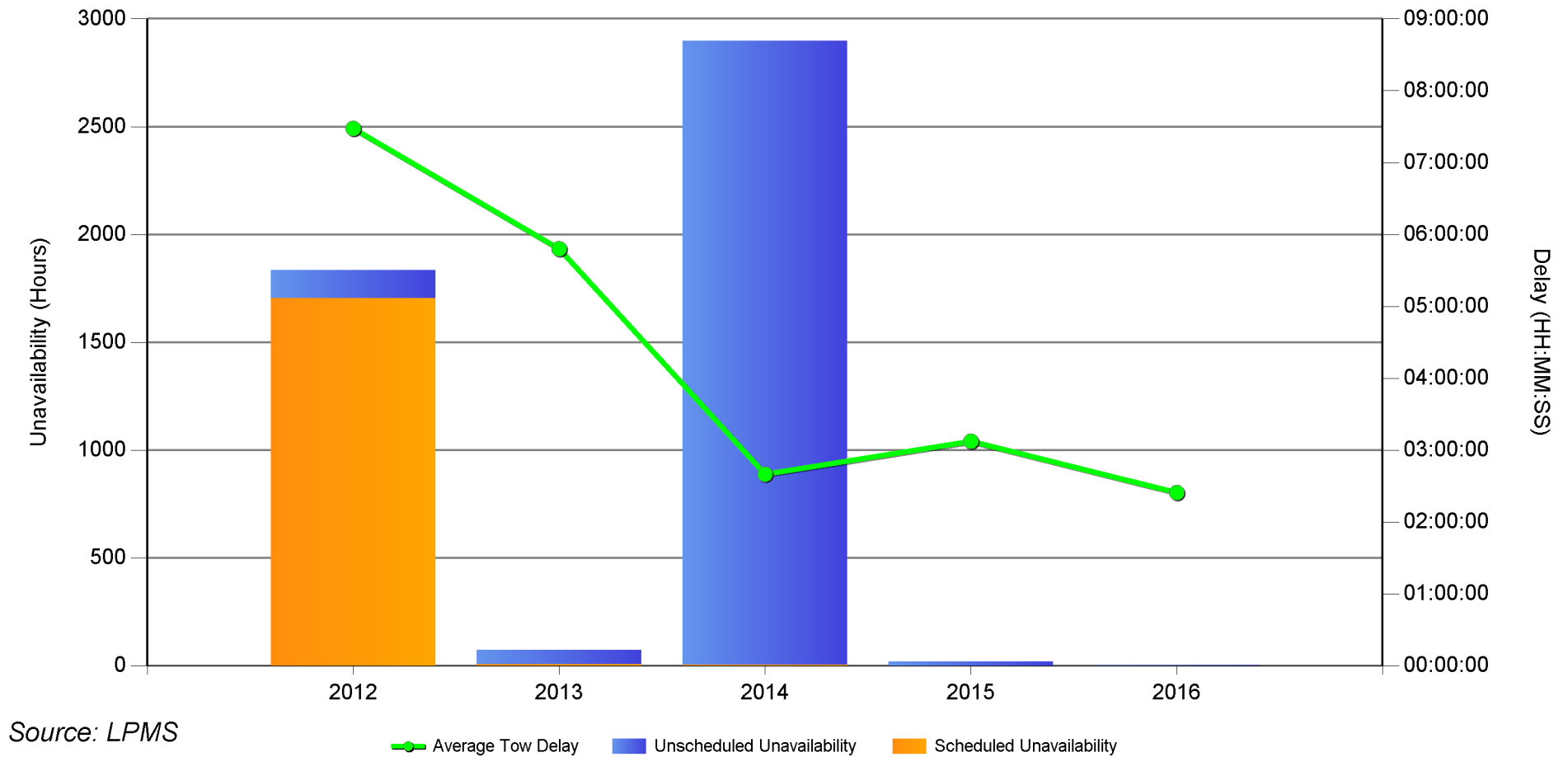
Source: Waterborne Commerce Statistics

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## Mississippi L&D 27 Unavailability and Delay



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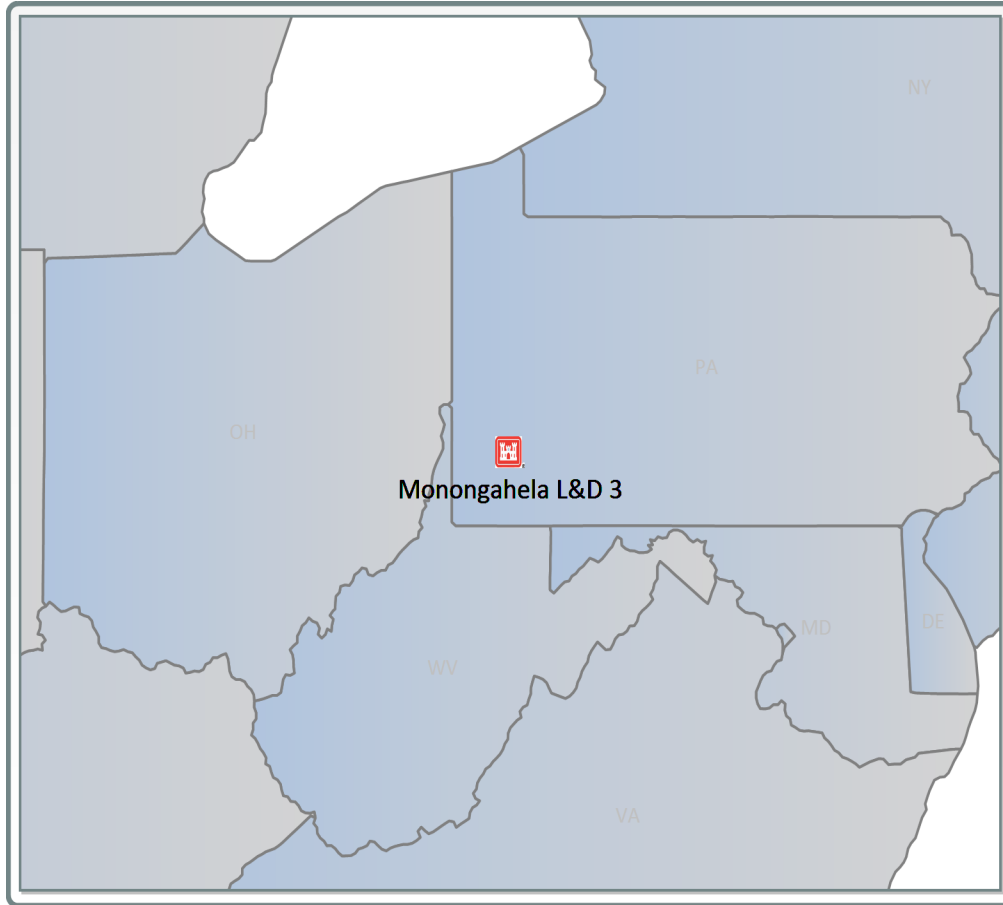


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# Monongahela L&D 3

BUILDING STRONG ®

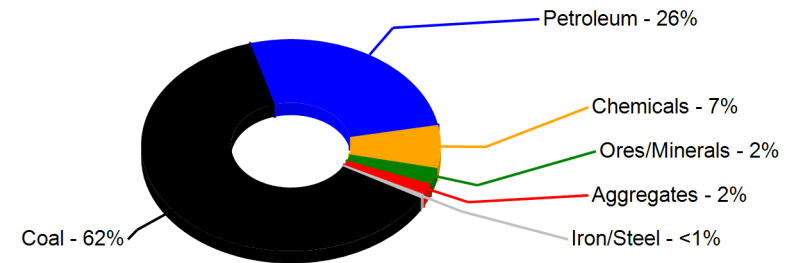


## 2016 Quick Facts

Commercial Lock Operations - 4,334	National Rank - 28
Short Tons (Thousands) - 8,447	National Rank - 78
Commodity Value (Millions) -	\$720.43
Average Tow Delay (HH:MM:SS) -	01:13:43

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

\*\* Remaining 0.46% Unable to release due to insufficient operators

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## Lock Information

### Location:

Monongahela Locks and Dam 3 is one of nine navigation structures which provide for year-round navigation on the Monongahela River between Pittsburgh, Pa. and Fairmont, W.Va. It maintains a pool for 23.8 miles above the mouth of the Youghiogheny River, just above Elizabeth, PA.

Locks and Dam 3 is located at river mile 23.8 at the city of Elizabeth. The lock chambers and operations buildings are situated along the right bank of the river adjacent to a main line of Pittsburgh and Lake Erie Railroad. Road access to the project is from a local road going south out of Elizabeth.

### History:

Construction of Locks and Dam 3 at this present site was begun in 1905 and completed in 1907. After some 70 years of use, a major rehabilitation of the project, the busiest on the Mon River, was completed in 1980. This work involved reconstruction of the lock chambers.

Locks and Dam 3 consists of two lock chambers and a fixed crest dam. This type of dam is basically a concrete weir or wall across the river which keeps the river channel upriver of the project deep enough for navigation -- about 9 feet or more. Water that flows over this type of dam cannot be controlled locally. Consequently, it cannot provide any control over flood waters. An incidental benefit derived from the pool formed by the dam is the availability of a source of municipal and industrial water.

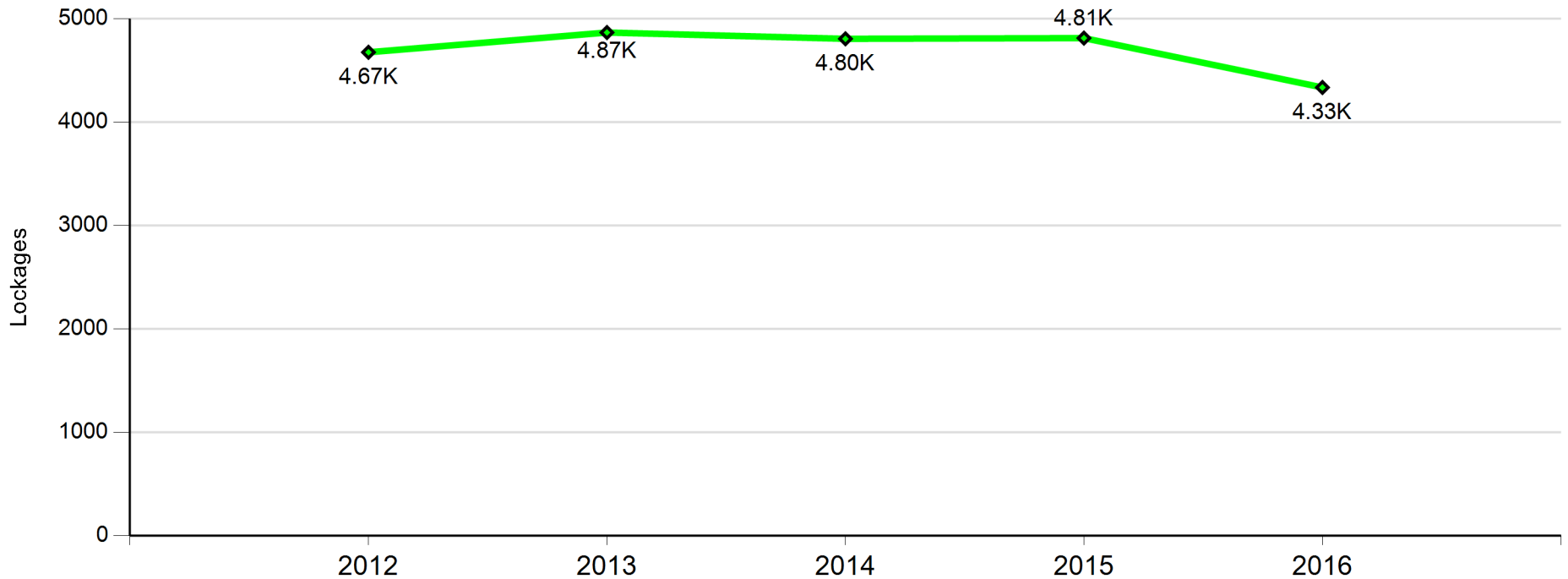
Locks and Dam 3 is part of the Lower Mon Project which has modernized Braddock Locks and Dam, is in the process of modernizing Locks and Dam 4, Charleroi, Pa., and will remove Locks and Dam 3, Elizabeth, Pa.

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## Annual Number of Commercial Lockages

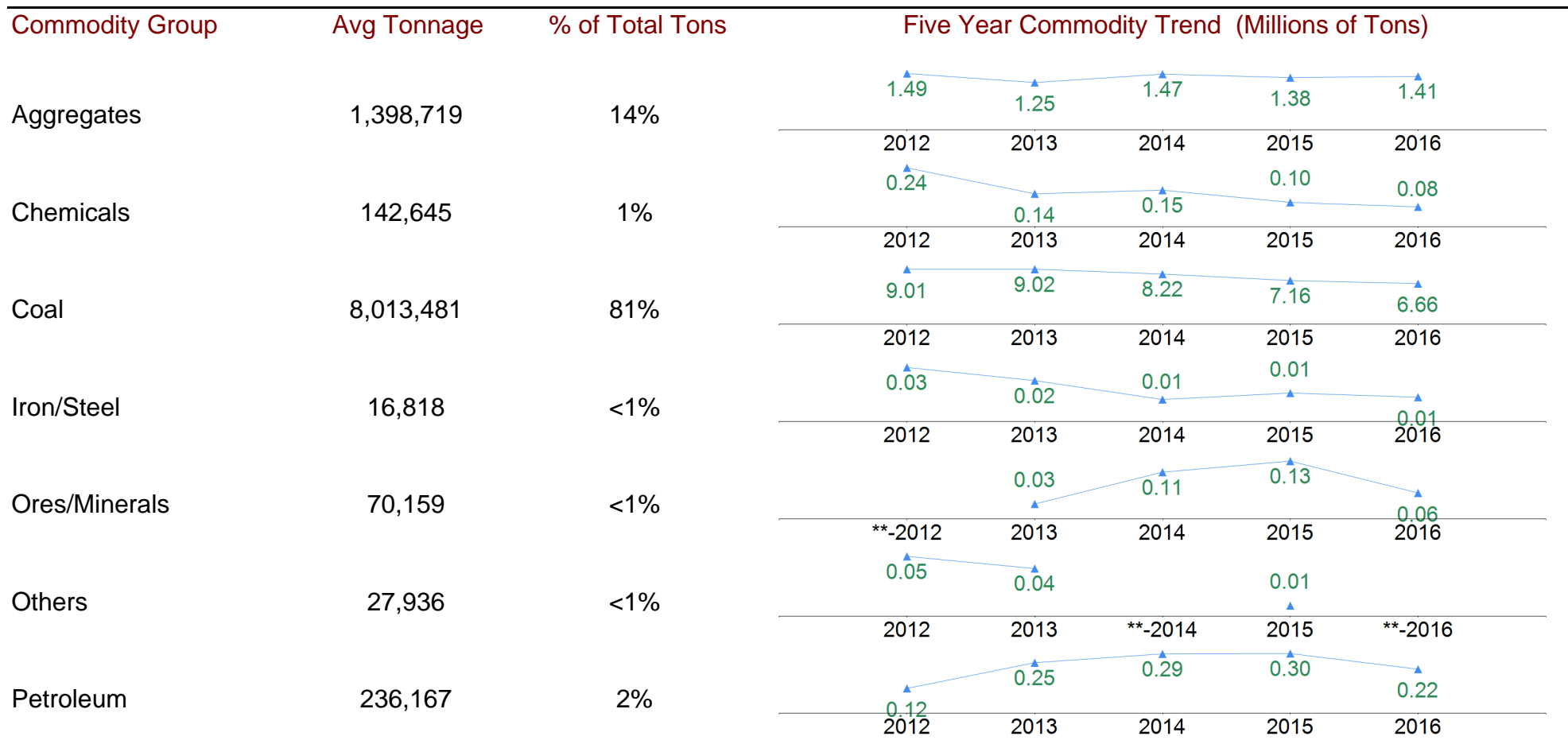


Source: LPMS

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\*\*Year = Insufficient Operators to Release Tonnage

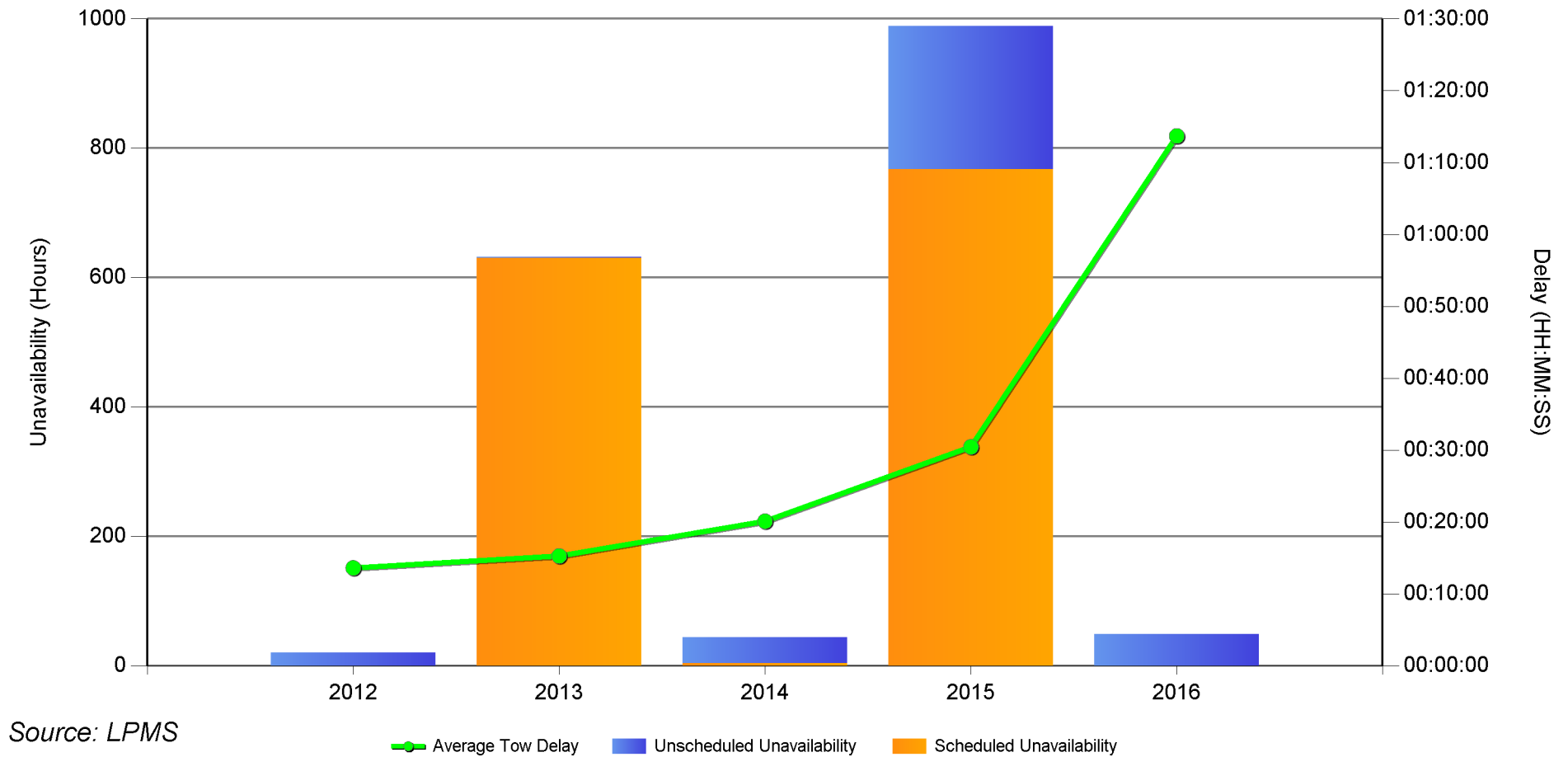
Source: Waterborne Commerce Statistics

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## Monongahela L&D 3 Unavailability and Delay



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# Monongahela L&D 4 (Charleroi)

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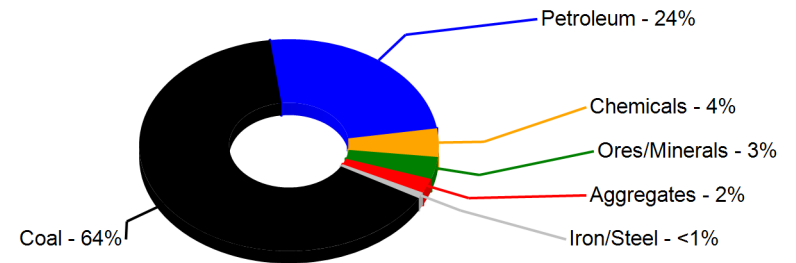


## 2016 Quick Facts

Commercial Lock Operations - 3,561	National Rank - 41
Short Tons (Thousands) - 6,611	National Rank - 90
Commodity Value (Millions) -	\$527.14
Average Tow Delay (HH:MM:SS) -	00:24:05

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

\*\* Remaining 0.63% Unable to release due to insufficient operators

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## Lock Information

### Location:

Monongahela Locks and Dam 4 is one of nine navigation structures which provide for year-round navigation on the Monongahela River between Pittsburgh, Pa. and Fairmont, W.Va.

### History:

Locks and Dams 2, 3 and 4 on the Monongahela River in Allegheny, Washington and Westmoreland counties in Southwestern Pennsylvania, are the three oldest currently operating navigation facilities on the Monongahela River. These locks experience the highest volume of commercial traffic on the entire Monongahela River Navigation System and the pools created by these facilities provide industrial and municipal water, and are popular with recreational boaters.

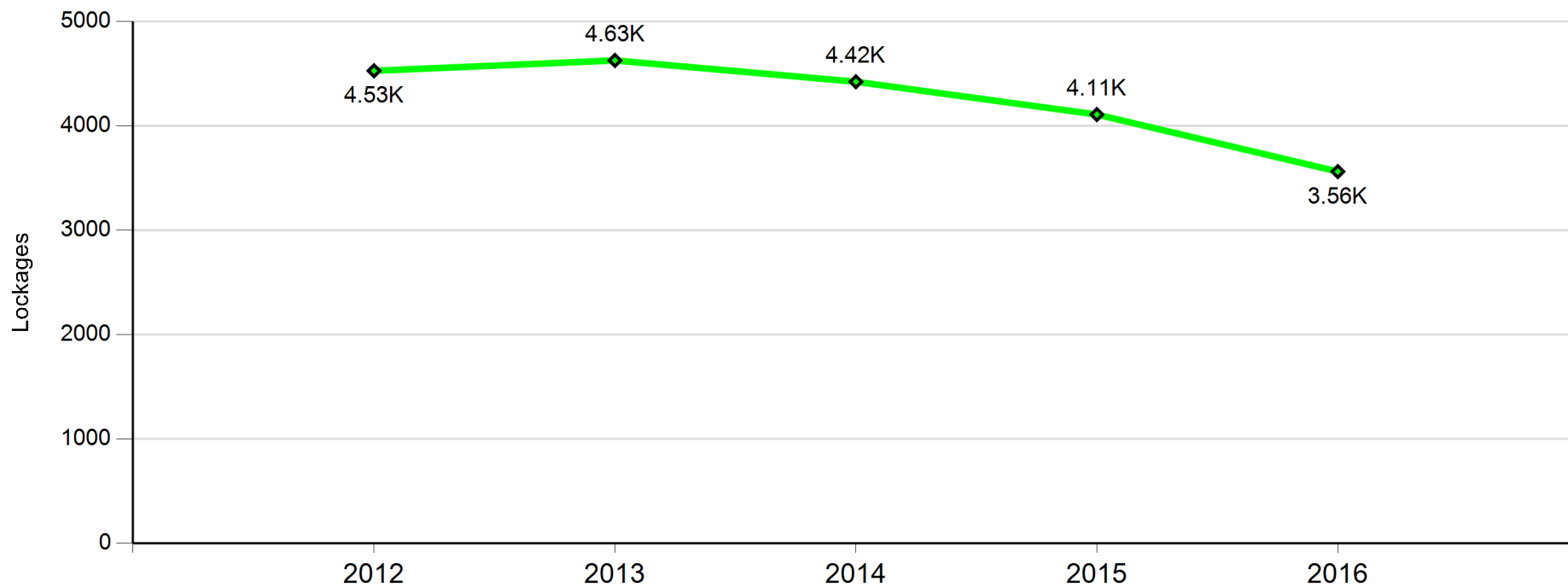
The Lower Monongahela Project replaced the nearly 100 year-old fixed-crest dam at Braddock Locks and Dam with a gated dam, will remove Locks and Dam 3 in Elizabeth, and construct two new larger locks (Charleroi Locks) at Locks and Dam 4 in Charleroi.

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## Annual Number of Commercial Lockages



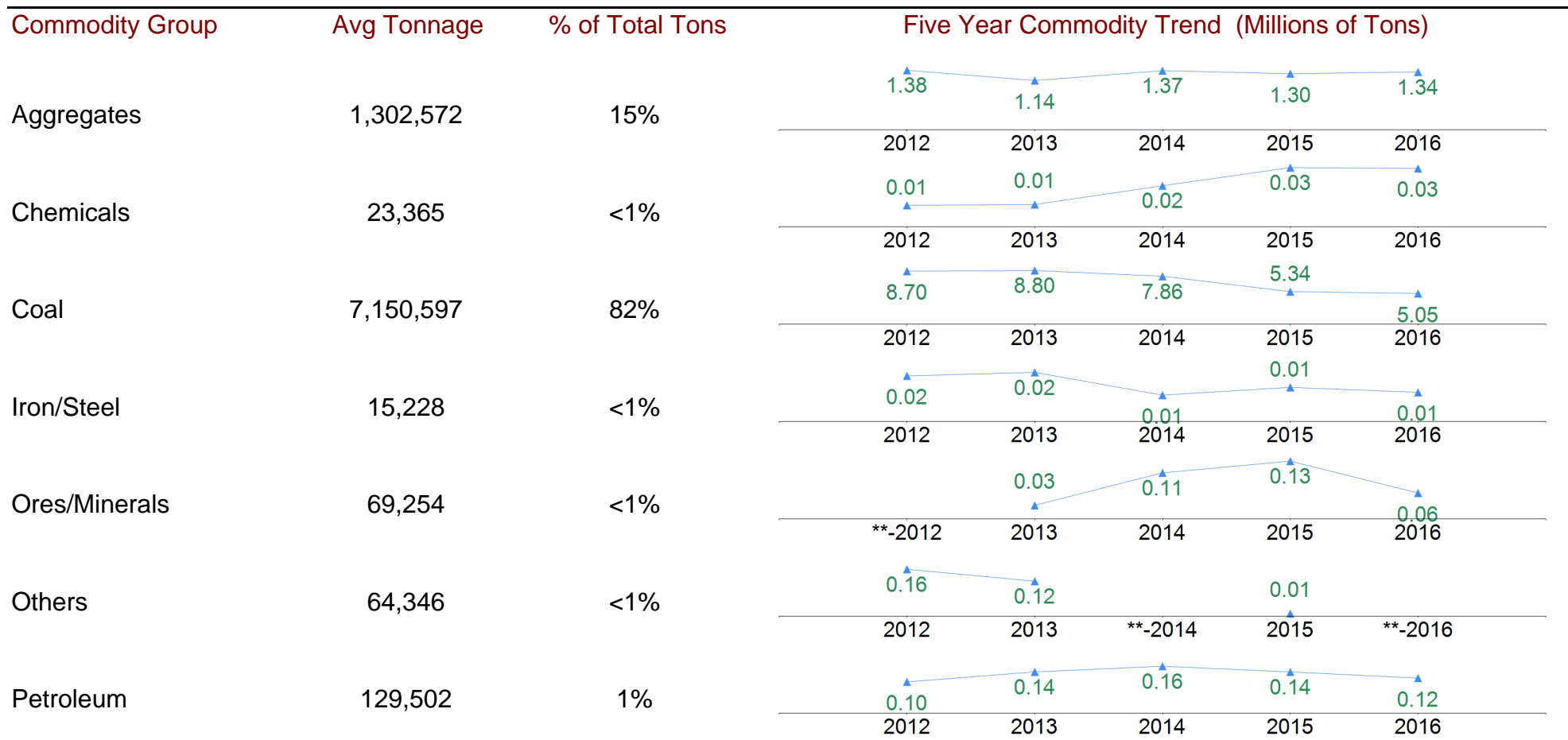
Source: LPMS

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\*\* -Year = Insufficient Operators to Release Tonnage

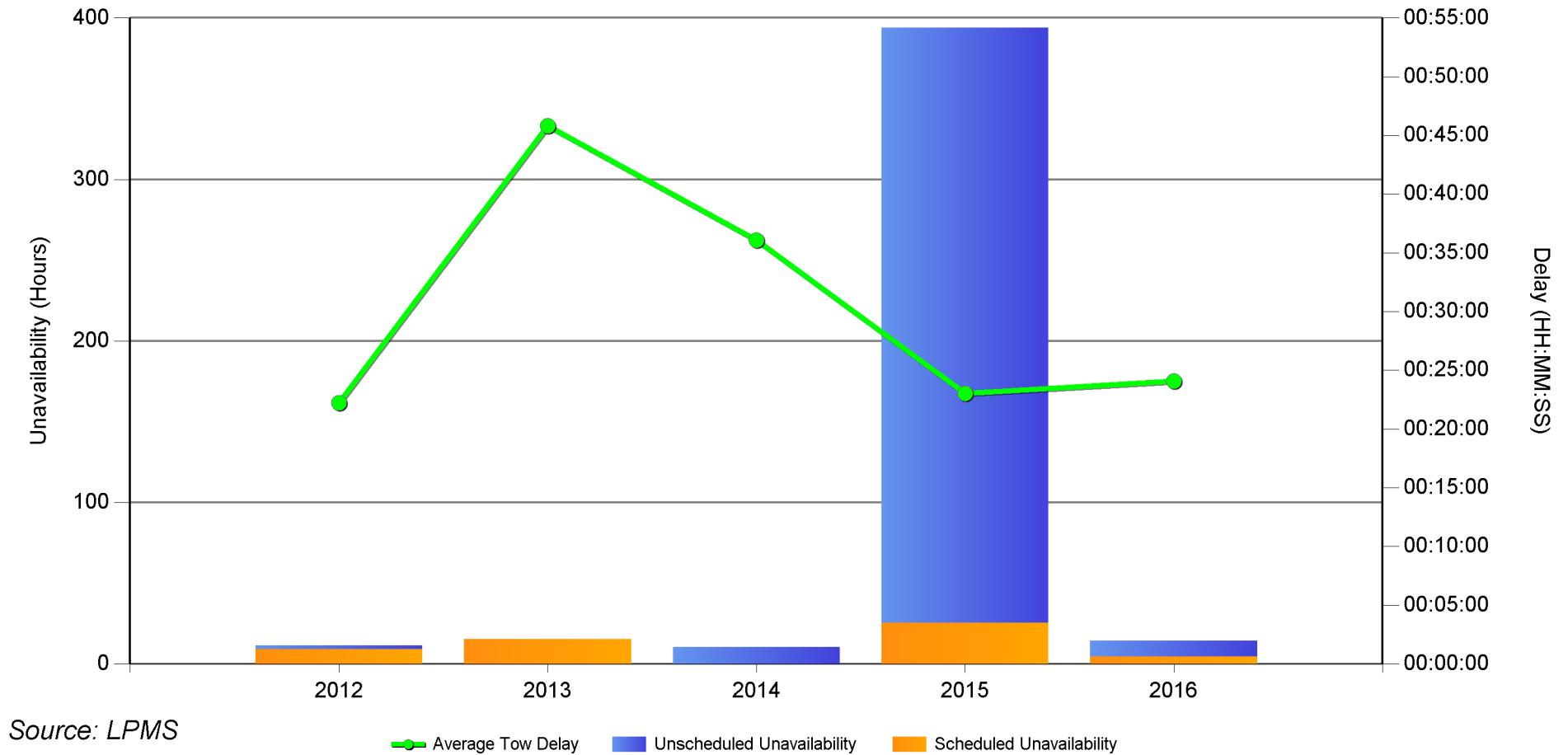
Source: Waterborne Commerce Statistics

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## Monongahela L&D 4 (Charleroi) Unavailability and Delay



Source: LPMS

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# Ohio River L&D 52

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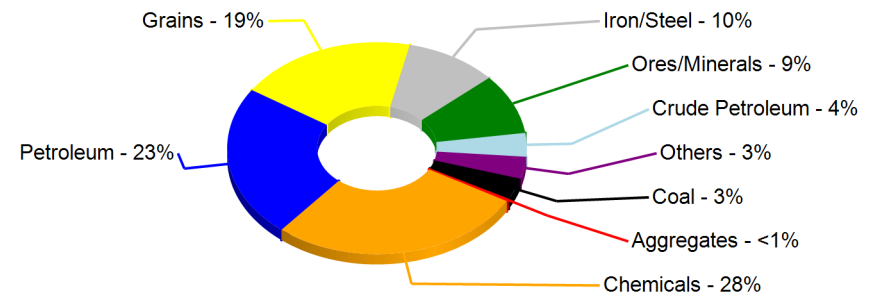


## 2016 Quick Facts

Commercial Lock Operations - 6,843	National Rank - 12
Short Tons (Thousands) - 65,550	National Rank - 2
Commodity Value (Millions) -	\$24,367.43
Average Tow Delay (HH:MM:SS) -	03:39:55

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

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## Lock Information

### Location

Ohio River Locks and Dam 52 is located on the Ohio River about 1.5 miles downstream of Brookport, Illinois, at mile 938.9 below Pittsburgh, Pennsylvania. The locks are located on the Illinois bank of the river.

### History

Modernization of the facilities at Locks and Dam 52 was authorized under the provisions of the Rivers and Harbors Act of March 3, 1909. The original structure of Ohio River Locks and Dam 52 was completed in 1928.

A temporary 1200-foot lock has been built to handle the traffic that moves through the lower portion of the river. This provisional structure provides relief to the typical traffic jam that previously occurred at the locks and dam. The Olmsted Locks and Dam project will include a permanent replacement to Locks and Dam 52, as well as Locks and Dam 53.

### Dimensions

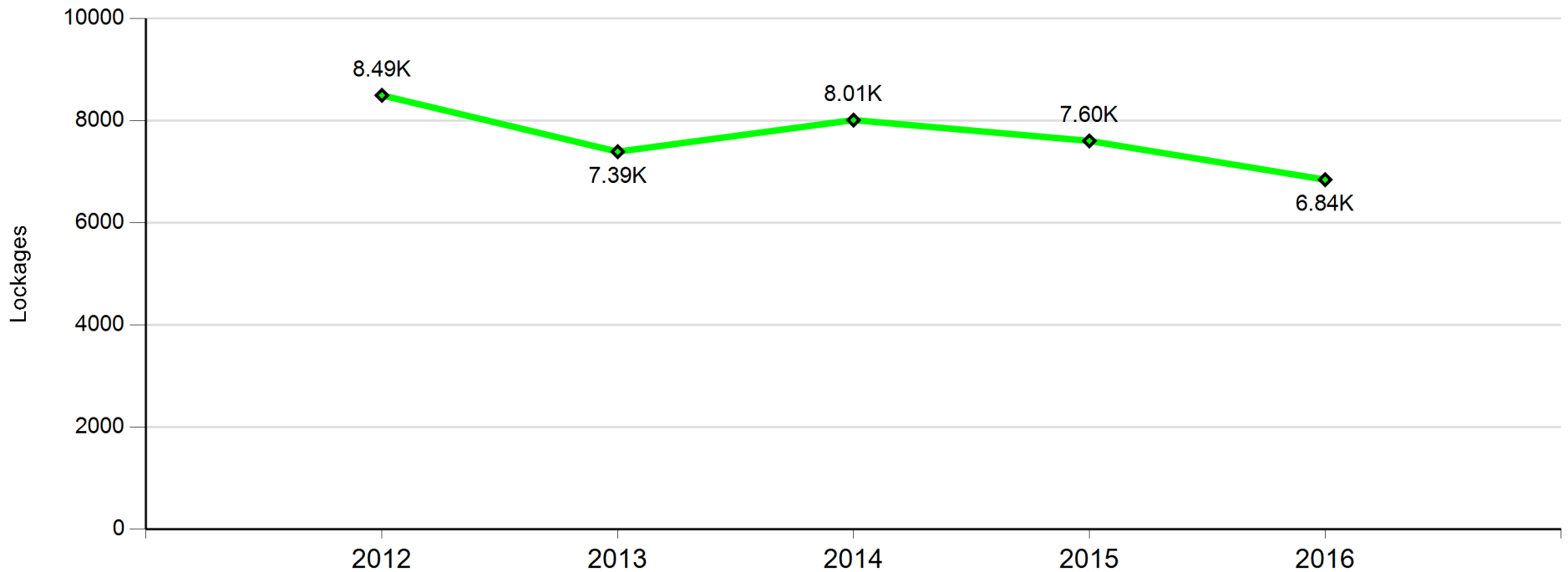
The main lock is 110-feet by 1200-feet, and the auxiliary lock is 110-feet by 600-feet.

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## Annual Number of Commercial Lockages



Source: LPMS

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Commodity Group	Avg Tonnage	% of Total Tons	Five Year Commodity Trend (Millions of Tons)				
Aggregates	11,924,191	15%	12.45	10.91	11.71	12.93	11.62
			2012	2013	2014	2015	2016
Chemicals	7,718,887	10%	7.65	7.72	7.87	7.40	7.96
			2012	2013	2014	2015	2016
Coal	21,964,536	28%	36.05	27.04	20.46	14.48	11.79
			2012	2013	2014	2015	2016
Crude Petroleum	1,417,448	2%	0.59	1.00	1.90	2.23	1.37
			2012	2013	2014	2015	2016
Grains	13,240,982	17%	9.74	12.10	16.83	14.92	12.61
			2012	2013	2014	2015	2016
Iron/Steel	6,591,221	8%	6.29	6.54	8.07	6.53	5.53
			2012	2013	2014	2015	2016
Ores/Minerals	6,301,987	8%	5.93	5.77	7.02	7.69	5.10
			2012	2013	2014	2015	2016
Others	3,122,377	4%	3.07	3.05	3.12	3.08	3.30
			2012	2013	2014	2015	2016
Petroleum	5,275,968	7%	4.28	4.65	5.08	6.11	6.26
			2012	2013	2014	2015	2016

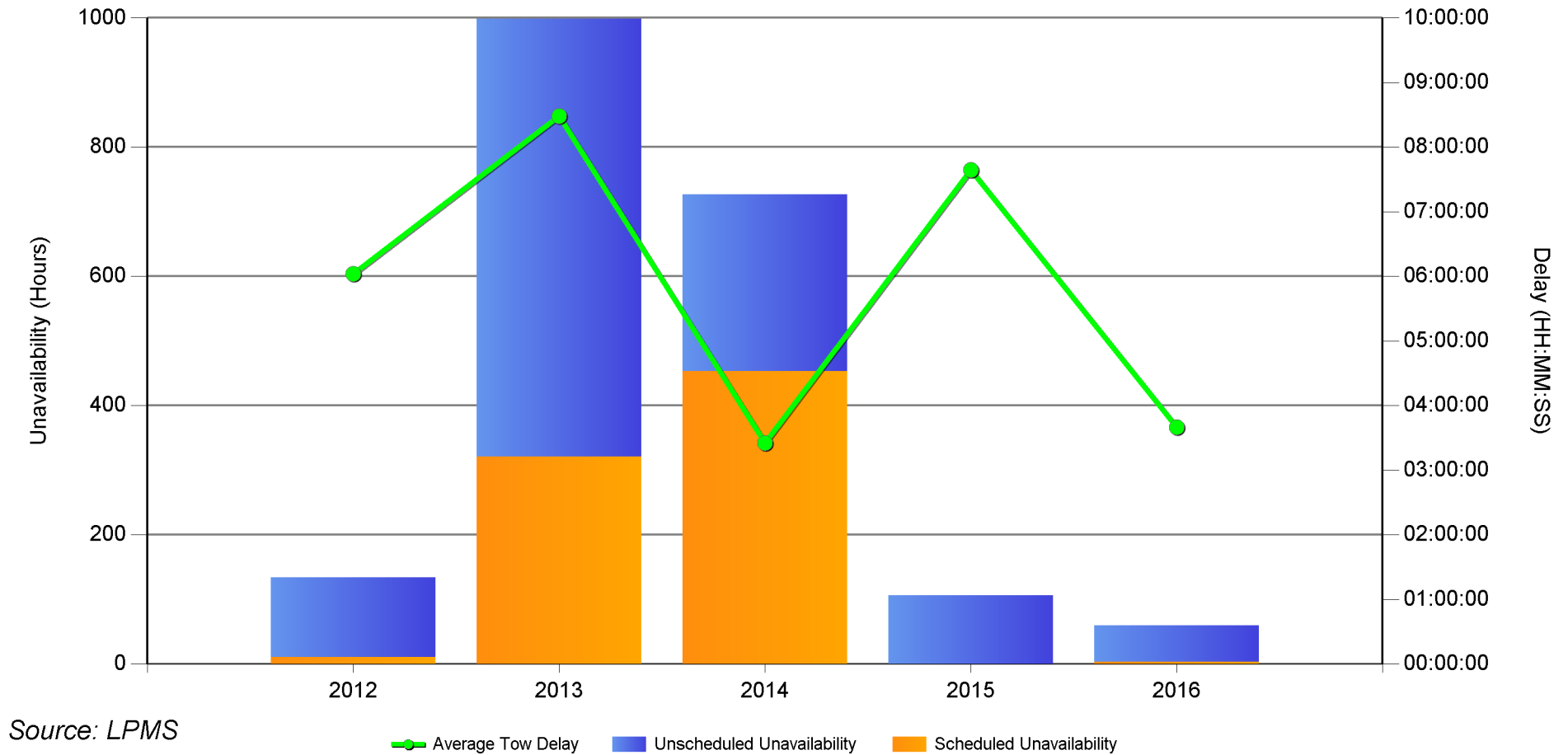
Source: Waterborne Commerce Statistics

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## Ohio River L&D 52 Unavailability and Delay



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# Ohio River L&D 53

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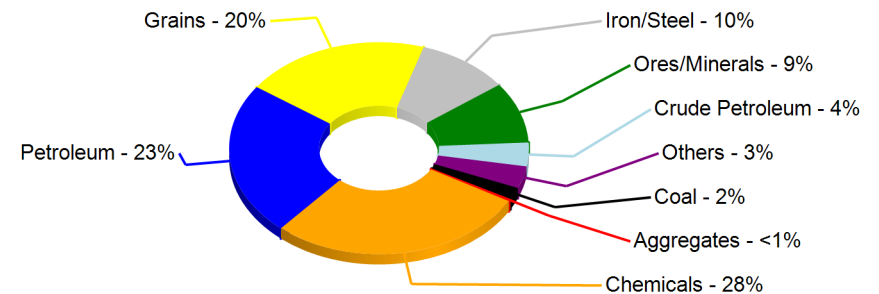


## 2016 Quick Facts

Commercial Lock Operations - 6,001	National Rank - 14
Short Tons (Thousands) - 59,315	National Rank - 4
Commodity Value (Millions) -	\$24,278.46
Average Tow Delay (HH:MM:SS) -	03:12:49

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

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## Lock Information

### Ohio River Locks and Dam 53

#### Location

Ohio River Locks and Dam No. 53 is located on the Ohio River approximately 11 miles upstream of Cairo, Illinois. The locks are located on the Illinois side of the river at navigation mile 962.6, which is approximately 962.6 miles downstream from Pittsburgh, Pennsylvania. The upper pool above the dam extends upstream for a distance of 23 miles to Locks and Dam 52.

#### History

Modernization of the facilities at Locks and Dam 53 was authorized under the provisions of the Rivers and Harbors Act at March 3, 1909. The original structure of Locks and Dam 53 was completed in 1929.

A temporary 1200-foot lock has been built at Lock 53 to handle the traffic that moves through the lower portion of the river. This provisional structure provides relief to the typical traffic jam that previously occurred at the locks and dam. The Olmsted Locks and Dam project will include a permanent replacement to Locks and Dam 53, as well as Locks and Dam 52.

#### Dimensions

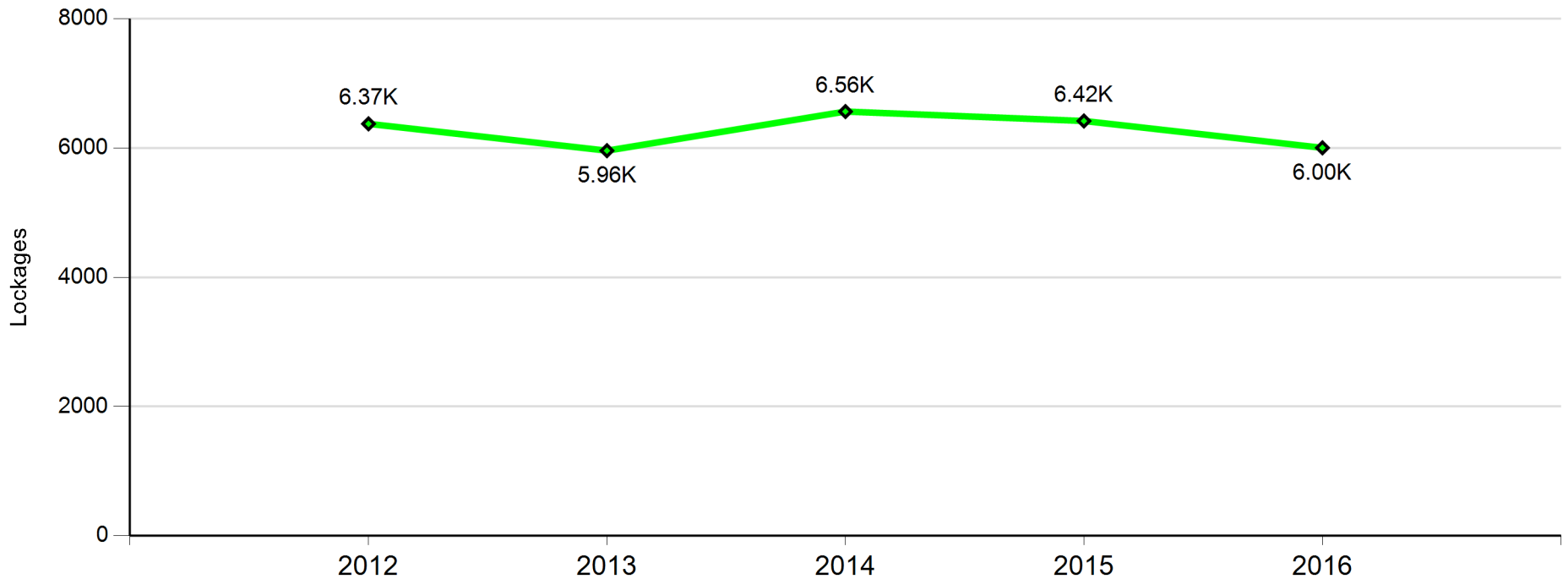
The main lock is 110-feet by 1200-feet, and the auxiliary lock is 110-feet by 600-feet.

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## Annual Number of Commercial Lockages



Source: LPMS

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Commodity Group	Avg Tonnage	% of Total Tons	Five Year Commodity Trend (Millions of Tons)				
Aggregates	10,055,231	15%	9.42	9.14	10.47	11.19	10.05
			2012	2013	2014	2015	2016
Chemicals	7,814,770	11%	7.73	7.79	7.99	7.52	8.05
			2012	2013	2014	2015	2016
Coal	14,292,238	21%	25.31	19.59	11.49	8.44	6.63
			2012	2013	2014	2015	2016
Crude Petroleum	1,417,448	2%	0.59	1.00	1.90	2.23	1.37
			2012	2013	2014	2015	2016
Grains	13,342,825	20%	9.74	12.21	16.84	14.96	12.96
			2012	2013	2014	2015	2016
Iron/Steel	6,616,455	10%	6.35	6.59	8.07	6.52	5.54
			2012	2013	2014	2015	2016
Ores/Minerals	6,355,401	9%	5.96	5.82	7.11	7.76	5.13
			2012	2013	2014	2015	2016
Others	3,164,270	5%	3.22	3.12	3.14	3.07	3.28
			2012	2013	2014	2015	2016
Petroleum	5,303,593	8%	4.31	4.65	5.10	6.16	6.30
			2012	2013	2014	2015	2016

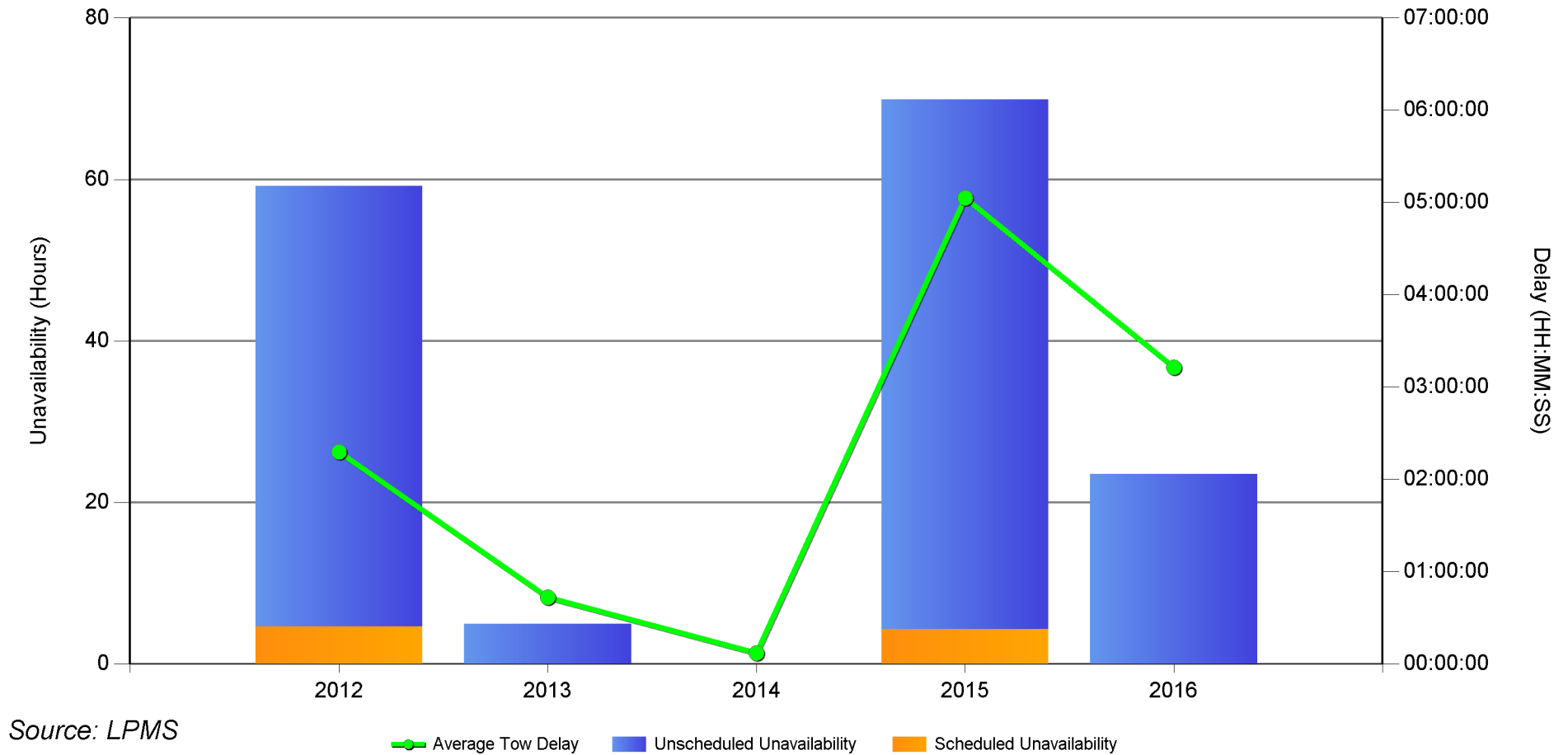
Source: Waterborne Commerce Statistics

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## Ohio River L&D 53 Unavailability and Delay



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# Brazos-High Island

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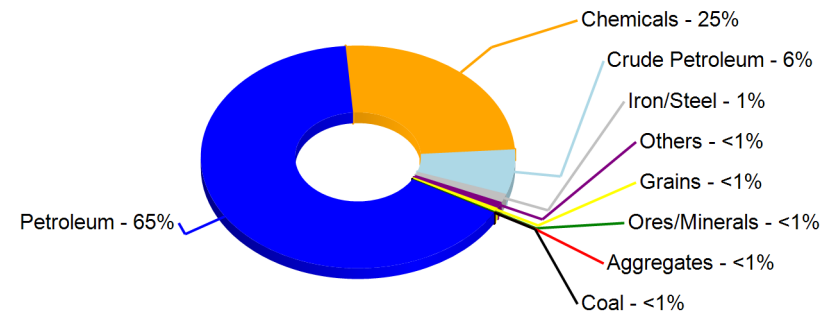
## 2016 Quick Facts

Short Tons (Thousands) - 65,010

Commodity Value (Millions) - \$64,180.70

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level (Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level (Commodity dollar values are not calculated for foreign movements)

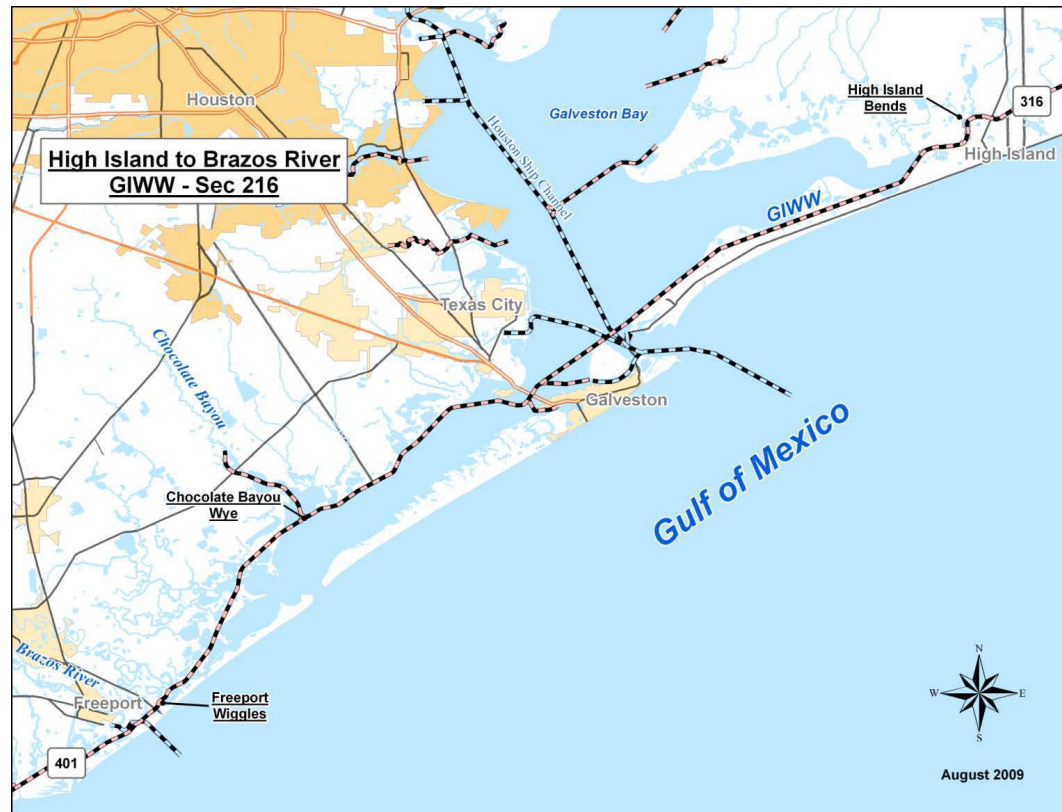
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## Project Information

Authorized in WRDA 2007, the project is a reach of the GIWW from High Island to Brazos River. This section contains significant wetland & environmental sensitive areas that must be protected. Navigational difficulties are caused by frequent shoaling at Rollover Pass, and traffic congestion at Sievers Cove and Texas City Wye. This portion of the channel needs to be realigned and new mooring facilities established.



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Commodity Group	Avg Tonnage	% of Total Tons	Five Year Commodity Trend (Millions of Tons)				
Aggregates	1,619,940	2%	1.59	1.12	1.76	1.72	1.91
			2012	2013	2014	2015	2016
Chemicals	15,735,925	24%	16.55	15.53	15.64	15.38	15.58
			2012	2013	2014	2015	2016
Coal	79,966	<1%	0.03	0.06	0.10	0.09	0.12
			2012	2013	2014	2015	2016
Crude Petroleum	10,438,259	16%	9.04	11.70	14.61	10.66	6.18
			2012	2013	2014	2015	2016
Grains	480,647	<1%	0.15	0.17	0.53	0.64	0.91
			2012	2013	2014	2015	2016
Iron/Steel	2,232,561	3%	2.58	2.52	2.55	1.82	1.69
			2012	2013	2014	2015	2016
Ores/Minerals	611,126	<1%	0.79	0.69	0.66	0.67	0.25
			2012	2013	2014	2015	2016
Others	991,097	2%	1.02	1.07	1.16	0.96	0.74
			2012	2013	2014	2015	2016
Petroleum	33,387,908	51%	32.08	30.96	32.72	33.55	37.64
			2012	2013	2014	2015	2016

Source: Waterborne Commerce Statistics

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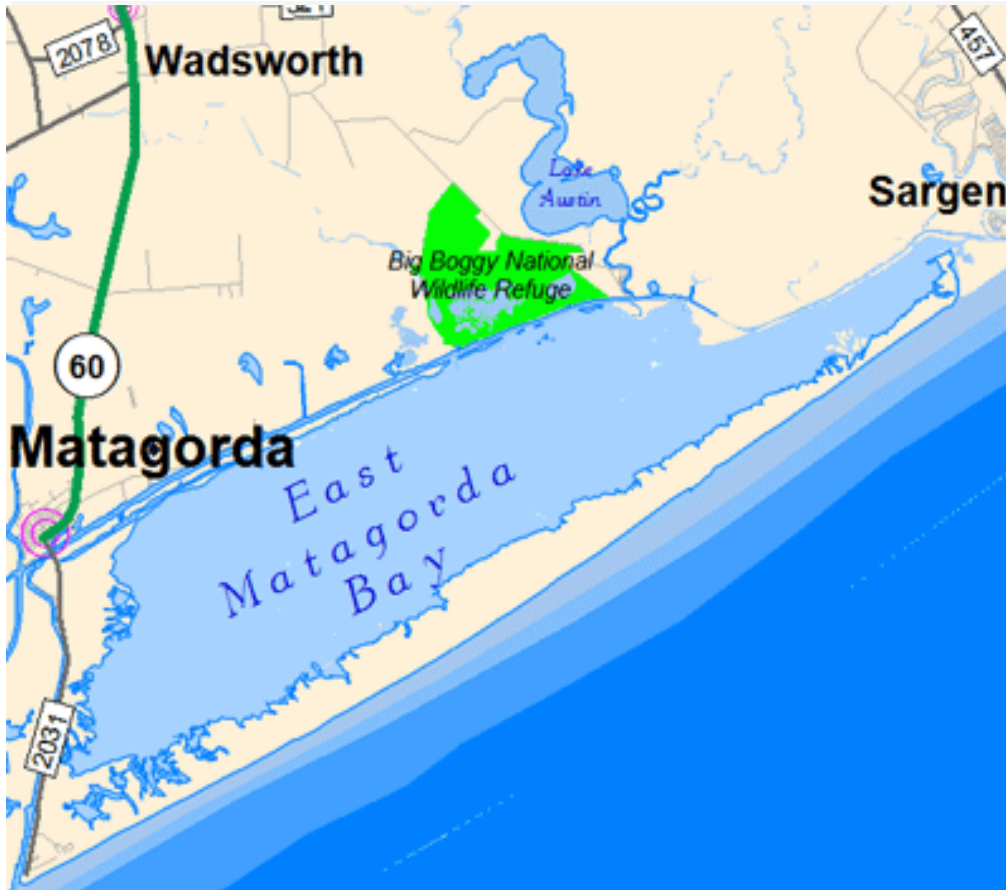


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# Matagorda Bay

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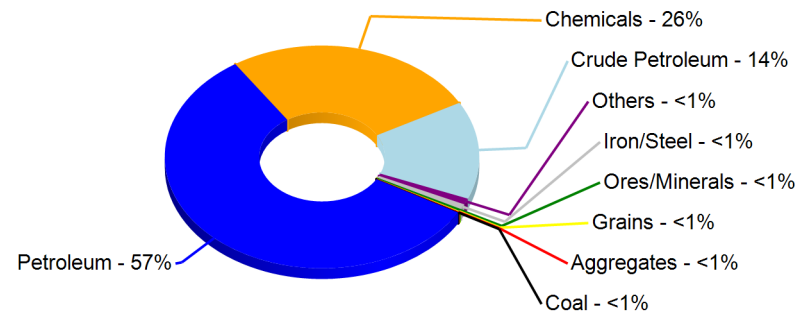
## 2016 Quick Facts

Short Tons (Thousands) - 19,282

Commodity Value (Millions) - \$17,114.70

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

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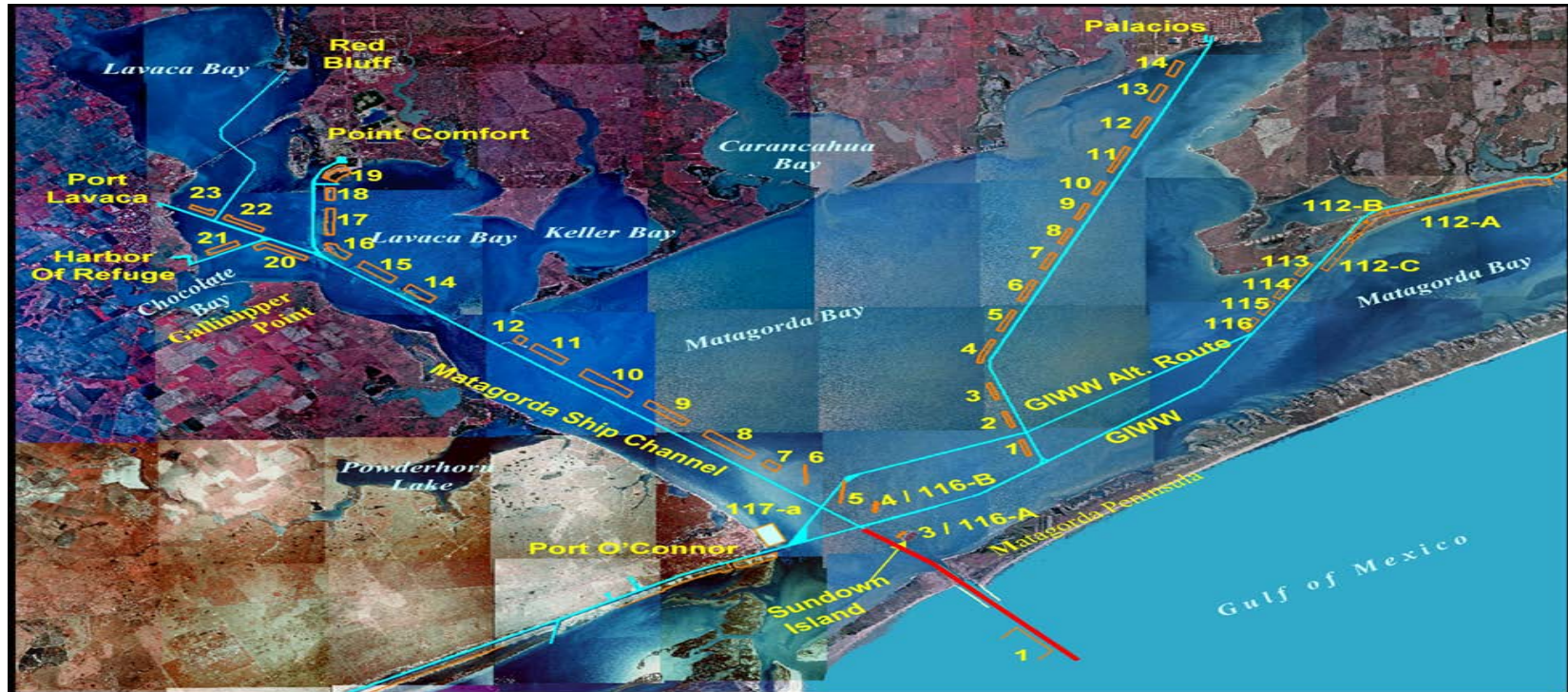
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## Project Information

The navigation study was authorized in Sec 216 of 1970 Flood Control Act. Section 201 of the River and Harbor Act of 1965, with the construction authorized in WRDA 2007. The navigation project is located on the Gulf coast in southeast Texas at approximately the midpoint between Corpus Christi and Galveston. Severe cross-currents and shoaling have resulted in a serious navigation hazard for barges traversing Matagorda Bay, threatening both loss of life and property. The proposed alternate channel would provide safe passage for navigation traffic. This reach of the Gulf Intracoastal Waterway (GIWW) extends from Channel Mile 454 to 473, a distance of about 19 miles. The GIWW leaves the landlocked portion on the eastern side of Matagorda Bay near Mile 454 and turns in a southwesterly direction before turning west and running parallel to Matagorda Peninsula. At Mile 471, the GIWW intersects with the deep-draft Matagorda Ship Channel (MSC). The GIWW enters the landlocked portion again at Port O'Connor near Mile 473. Historically, shoaling occurs at a rapid rate. Water depths in this area are naturally shallow and numerous oyster reefs characterize the area. The shoaling rate is probably the result of sediment movement by wind and tidal action between Matagorda Bay and West Matagorda Bay. The proximity of the GIWW to the natural pass of Pass Cavallo and the construction of the jettied entrance channel and deep-draft MSC has created hazardous navigation.



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\*\*Year = Insufficient Operators to Release Tonnage

Source: Waterborne Commerce Statistics

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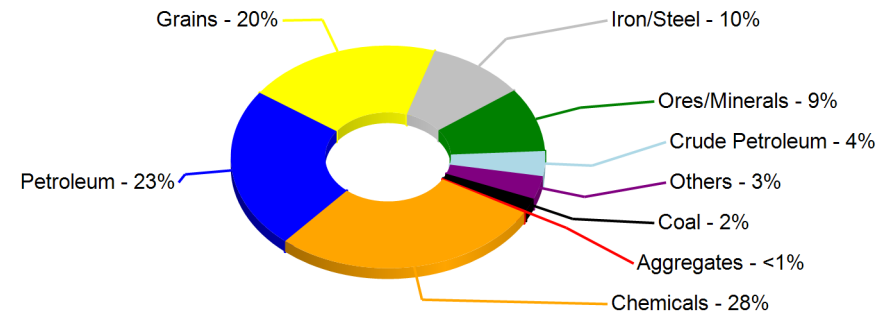
## 2016 Quick Facts

Short Tons (Thousands) - 59,270

Commodity Value (Millions) - \$24,278.00

Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

## 2016 Commodity Value Distribution



Source: USACE WCS, Values estimated from 2012 NDSU Commodity Valuation Study, indexed to 2016 price level(Commodity dollar values are not calculated for foreign movements)

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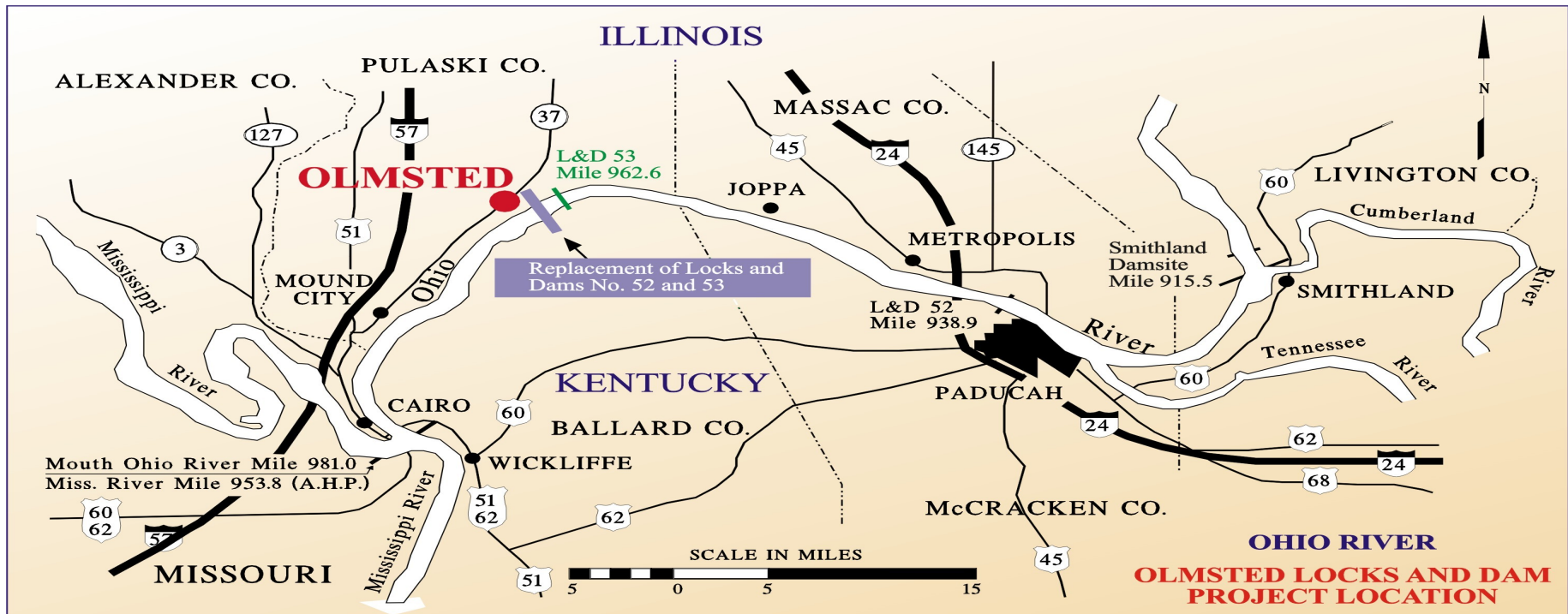
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## Project Information

The demand for waterborne commerce on the Ohio River requires periodic improvements in the waterways transportation infrastructure. Locks and Dams No. 52 and 53, located on the Ohio River between Paducah, Kentucky, and Cairo, Illinois, were completed in 1929. Temporary 1200-foot long lock chambers were added later. The antiquated design and age of these structures make it impossible to meet current traffic demands without significant delays. The Locks and Dam 52 and 53 Replacement Project, known as the Olmsted Locks and Dam was authorized in WRDA 1988 and is under construction between Illinois and Kentucky about 17 miles upstream (Ohio River mile 964.4) from the confluence of the Ohio and Mississippi rivers. Olmsted will replace locks and dams 53 and 52 and greatly reduce tow and barge delays through the busiest stretch of river in Americas inland waterways. This strategic reach of the Ohio River provides a connection between the Ohio, Tennessee, Cumberland, and Mississippi rivers. The area has been described as the "hub" of the Ohio and Mississippi rivers waterway system. Barge traffic moving between the Mississippi River system and the Ohio, Tennessee, and Cumberland rivers must pass through this stretch of river. More tonnage passes this point than any other place in America's inland navigation system. This is a critical reach of water from a commercial navigation perspective.



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Commodity Group	Avg Tonnage	% of Total Tons	Five Year Commodity Trend (Millions of Tons)				
Aggregates	10,035,872	15%	9.42	9.14	10.47	11.14	10.01
			2012	2013	2014	2015	2016
Chemicals	7,814,770	11%	7.73	7.79	7.99	7.52	8.05
			2012	2013	2014	2015	2016
Coal	14,292,238	21%	25.31	19.59	11.49	8.44	6.63
			2012	2013	2014	2015	2016
Crude Petroleum	1,417,448	2%	0.59	1.00	1.90	2.23	1.37
			2012	2013	2014	2015	2016
Grains	13,343,201	20%	9.74	12.21	16.84	14.96	12.96
			2012	2013	2014	2015	2016
Iron/Steel	6,616,455	10%	6.35	6.59	8.07	6.52	5.54
			2012	2013	2014	2015	2016
Ores/Minerals	6,355,401	9%	5.96	5.82	7.11	7.76	5.13
			2012	2013	2014	2015	2016
Others	3,164,562	5%	3.22	3.12	3.14	3.07	3.28
			2012	2013	2014	2015	2016
Petroleum	5,303,593	8%	4.31	4.65	5.10	6.16	6.30
			2012	2013	2014	2015	2016

Source: Waterborne Commerce Statistics

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