



**WATERWAYS**  
COUNCIL, INC.

## Upper Ohio River Navigation Study, Pennsylvania



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| <b>Location</b>                   | On the Ohio River downstream from Pittsburgh, Pennsylvania. Emsworth: Mile 6; Dashields, Mile 13.3; Montgomery Mile 31.7   |
| <b>Existing Structures</b>        | Each project has a 110' x 600' main lock and 56' x 360' auxiliary lock. Emsworth was built in 1921, Dashields in 1929 and Montgomery in 1936.  |
| <b>Annual Tonnage</b>             | In 2001, almost 27 million tons of commerce worth over \$3.34 billion transited one or more of these locks. 73% of this traffic was coal. Other important commodities included aggregates, petroleum, iron and steel. 36 million tons by the year 2010 and 40 million tons by 2030.  |
| <b>Summary of Problems</b>        | Emsworth, Dashields and Montgomery are the only projects on the Ohio River without 110' x 1200' main chambers. The costs associated with major rehabilitation and major maintenance over a 50-year economic design life may exceed the cost of replacement with new larger facilities. Any closures of the main chambers for repairs force greater future reliance on the very small auxiliary chambers. |
| <b>Corps of Engineers Actions</b> | A system study of improvements on the Upper Ohio River is underway.  |

## Project Description

The Upper Ohio River Navigation Study Project is located in southwestern Pennsylvania and consists of the Emsworth, Dashields and Montgomery Locks and Dams, all over 70 years old. These three facilities are the uppermost navigation structures on the Ohio River located 6.2, 13.3 and 31.7 river miles below the "Point" in Pittsburgh, Pennsylvania. All three facilities have dual locks chambers with 110' x 600' main chambers and 56' x 360' auxiliary chambers which are the smallest capacity chambers of the Ohio River navigation system. The Emsworth pool (which extends 6.7 miles up the Allegheny River and 11.5 miles up the Monongahela River) is formed by main and back channel gated dams totaling 1,717 feet in length and comprised of 14 gates and one fixed weir section. The Dashields pool is formed by a 1,585' fixed crest weir dam. The Montgomery pool is formed by a dam with 10 gates and one fixed weir section. Emsworth was constructed in 1922 with the new gated dam added in 1938 using old fixed crest dams as stilling basins and aprons. Dashields was constructed in 1929 and Montgomery constructed in 1936. Emsworth and Montgomery Dams are the oldest gated structures on the Ohio River, while Dashields Dam is the only fixed crest dam on the river. Each of the three facilities are showing significant signs of structural and operational degradation increasing risk of structural and/or operational failure which would halt navigation. The focus of the Upper Ohio River Navigation Study is to develop the best plan for maintaining safe, reliable, efficient and environmentally sustainable navigation on the upper 40 miles of the Ohio River.

## Transportation Importance to the System

Traffic through the Upper Ohio River projects totaled 22 million tons in 2004, with coal accounting for 17 million tons or 78 percent. Coal moves both upbound and downbound depending on the characteristics of the coal, and on the locations of mines and coal consuming facilities. Electric utilities move coal from mines in Monongahela Basin upstream of the Upper Ohio projects to generating plants downstream on the Ohio while steel and other electric generating companies move coal from mines downstream of the projects to West Virginia and Kentucky mines to coking and generating plants upstream in the Monongahela Basin. Construction companies use the project to move materials like stone, sand and gravel, and cement into the Pittsburgh area. The estimated transportation savings attributable to the Upper Ohio subsystem is \$144 million annually.

## Risk and Reliability, Economic Impacts of Unscheduled Lock Outages

Analysis, modeling, and inspections have shown the projects to be extremely unreliable with high probabilities of failures that could result in unscheduled closures of up to a year in duration. If the failures occurred at a main lock chamber or one of the dams, the consequences would be catastrophic given their location in the Pittsburgh metropolitan area. In fact, the projects create the pool along which the "Point", or downtown area of the City of Pittsburgh, is located. It is the site of numerous office buildings, sports arenas, residential housing, and marinas. The effects would not be limited to barge transportation, but would extend to a multitude of uses of the river including municipal and industrial water supplies, tour boat operators that service the major league stadiums and other entertainment facilities in the pools, and possibly to buildings and other shore side infrastructure that could be damaged by bank cave-ins. Fish and wildlife could be destroyed due to loss of habitat if a loss of pool was to occur.

Directly affected by disruptions to transportation are the US Steel Clairton Works, the largest coke plant in the country, and the Bailey/Enslow Fork Complex owned by Consol Energy, the largest underground coal mine in the country. Disruption in coal supply and transportation would also impact steel plants and coal-fired electric power plants. A recent survey of the effects of an unscheduled closure at Montgomery found the cost to one Pittsburgh area company of \$1 million dollars a day of lost production. The costs to other industries were generally lower but with over 500 shippers and 500 receivers, the total was significant. At some point industry will either switch to other transportation modes or locate to other areas, including overseas, if they deem the system sufficiently unreliable and the costs of alternative transportation too high. This would jeopardize the 33,000 jobs related to the operation of an efficient and reliable system.

## Project Funding History

The study project is 100% federally funded. Approximately \$4.6 million has been expended from FY03 through FY 2007, leaving a balance of approximately \$10 million to complete the study in FY11. The \$4.6M was utilized to perform inspections and reliability analysis on lock and dam components, conduct environmental scoping meetings, initiate transportation cost and externality analyses and complete the Feasibility Scoping Meeting.

## Optimum Funding Needs

In order to meet the most efficient schedule for completion of the study in 2011, funding is required as follows: FY09 - \$4.2M; FY10 - \$2.6M; FY11 - \$0.6M. The challenge is to maintain an efficient funding schedule to complete the study for inclusion in WRDA 2012. No funding for this study was included in the President's FY08 or FY09 budgets. \$2.46M was received to support the FY08 work plan. This funding along with the FY09-FY11 funding levels are required to meet the 2011 completion. Each year the study is delayed increases the risk of structural and/or operational failure at the facilities.