



**SILVERLODE**  
CONSULTING

# Buckeye Lake Economic Impact Report

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# SUMMARY OF FINDINGS

## THREE-COUNTY LEVEL ESTIMATED ECONOMIC AND FISCAL IMPACT SUMMARY

Total Jobs Potentially at Risk:

**668 - 1,174**

*This range represents the estimated total number of direct, indirect, and induced jobs at risk in Fairfield, Licking, and Perry Counties during the five-year study period.*

Total Potential Labor Income Impact:

**\$91.7 million - \$161.1 million**

*This range is the total labor income loss estimated in the three-county area during the five-year period.*

Total Potential Output Impact:

**\$344.7 million - \$605.9 million**

*This range is the total economic activity decrease estimated in the three-county area during the five-year period.*

Total State and Local Taxes Impact:

**\$24.0 million - \$42.2 million**

*This range represents an estimate of the total state and local taxes generated by the impacted economic activity in the three-county area. It includes taxes on individual and corporate earnings, taxes on sales and property, fees for licenses and registrations, etc.*

## STATE LEVEL ESTIMATED ECONOMIC AND FISCAL IMPACT SUMMARY

Total Jobs at Potentially Risk:

**760 - 1,336**

*This range represents the number of direct, indirect, and induced jobs at risk in the State of Ohio during the five-year study period.*

Total Potential Labor Income Impact:

**\$136.4 million - \$239.6 million**

*This range is the total labor income loss estimated in the State during the five-year period.*

Total Potential Output Impact:

**\$444.6 million - \$781.2 million**

*This range is the total economic activity decrease estimated in the State during the five-year period.*

Total Potential State and Local Taxes Impact:

**\$27.9 million - \$48.9 million**

*This range represents an estimate of the total state and local taxes generated by the impacted economic activity in the State. It includes taxes on individual and corporate earnings, taxes on sales and property, fees for licenses and registrations, etc.*

## ABOUT THIS REPORT

Buckeye Lake Dam (the “Dam”) has experienced deterioration for decades. In the spring of 2015, the United States Army Corps of Engineers (“USACE”) released a report which concluded there is a high likelihood of “catastrophic failure” of the Dam when Buckeye Lake (the “Lake”) is at normal or above normal pool levels, and stated there are serious risks to the public including significant economic damages and the endangerment of life. Accordingly, the Ohio Department of Natural Resources (“ODNR”) has lowered the Lake to “winter pool” level and has started the process of preparing for the construction of a new Dam (the “Dam project”).

As part of the civic and business community’s response to the lower Lake level and pending construction, Silverlode Consulting was engaged by the Fairfield County Commissioners, Licking County Commissioners, Perry County Commissioners, and Columbus 2020 to quantify the potential economic and fiscal impacts that may result from not returning the Lake to “summer” levels over a period of up to five-years.

Silverlode has enjoyed the opportunity to work with the four funding organizations and would like to thank the numerous organizations and communities from the Buckeye Lake area and surrounding region for providing us with valuable insights and local knowledge that helped guide and shape this report.

This report provides a description of Buckeye Lake, our Methodology and Assumptions, and our Findings.

# ABOUT BUCKEYE LAKE

## Overview of Buckeye Lake

Buckeye Lake is a reservoir in Fairfield, Licking, and Perry Counties in Ohio situated approximately 30 miles east of downtown Columbus. The 4.1 mile Dam is located in Fairfield and Licking counties and is partially owned by the State of Ohio. ODNR is responsible for the operation and maintenance of the Dam.

There are many residences built adjacent to and near Buckeye Lake. Buckeye Lake State Park is a 3,100 acre recreation attraction that offers fishing, swimming, picnicking, boating, a shoreline rich with waterfowl for bird watching, 135 docks to rent, and winter recreation opportunities. Additionally, Cranberry Bog, a floating island and unique natural resource, is a National Natural Landmark and a State nature preserve.

## History of the Dam

As Ohio's population grew in the early 1800's, a canal system was developed to connect people and goods. The canal system needed feeder lakes to provide the water to maintain the canal water level. Between 1825 and 1832, an earthen embankment was constructed to block drainage into the South Fork of the Licking River, creating the Licking Summit Reservoir. The lake was later enlarged to supply the needed water for the canals.

As railroads were developed and the canal system became abandoned, the General Assembly of Ohio designated feeder reservoirs as public parks and the Licking Summit Reservoir became Buckeye Lake. The area became a recreation destination with the popularization of power boats and the presence of the Buckeye Lake Amusement Park. With the creation of the Ohio Department of Natural Resources in 1949, the area became Buckeye Lake State Park and is the State's oldest state park.

## Deterioration of the Dam

In March of 2015, USACE released a report which detailed their assessment of the structural integrity of the Dam and evaluated the potential risk of the Dam's failure.

The structural integrity of the Dam has apparently been severely weakened by over 370 homes and other structures which have been constructed on the Dam embankment. The Dam has actually been removed in some places to accommodate amenities and utilities for these structures. Additionally, trees, cracks, and depressions have further weakened the Dam.

The report concluded there is a high likelihood of "catastrophic failure" of the Dam, when the Lake is at normal or above normal pool levels, and there are serious risks to

the public including significant economic damages and the endangerment of life. The inundated zone could include Buckeye Lake Village, Hebron, and part of I-70. Over 3,000 residents and employees; 2,100 homes; 75 businesses; and municipal, utility, and other structures could be impacted. Additionally, over 41,000 vehicles transverse the at-risk section of I-70 each day.

USACE recommended immediate steps to reduce the risk of Dam failure including keeping the Lake at a lower “winter pool” level, prohibiting the construction of any new structures into the Dam, and increasing emergency preparedness measures. The report concluded that ODNR needs to drain the Lake or replace the Dam.

### **Current Situation**

On March 19, 2015, Governor Kasich announced that ODNR will immediately begin work to replace Buckeye Lake Dam.

Since April of 2015, ODNR has maintained the Lake level at a “winter pool” level by releasing water through Lake drains until the Dam can be improved. The new operational Lake level reduces the surface area of the Lake by up to 16 percent and the volume by up to 55 percent compared to the summer pool level. Additionally, a No Wake Zone was created for all areas not within the newly created Speed Zone area, which permits water recreation to continue. Towing watersports are currently prohibited. ODNR is using two dredges for the Lake to increase access from businesses to the Speed Zone and to the islands and to improve water quality.

ODNR has conducted an emergency preparedness meeting and a public open house. They are conducting a technical inspection of the docks on the Dam to understand which docks can remain until construction and which docks may need to be removed. ODNR is working to address environmental issues like abundant fish “winter kills” and is working with local safety officials on emergency preparedness and with other agencies like the Office of Tourism and the local Convention and Visitors Bureau to market Buckeye Lake as a region.

### **ODNR Timetable and Plan**

ODNR issued a Request for Qualifications in March of 2015 for design consultants to submit qualifications for Dam construction. There were six submissions and ODNR has short-listed the group to three finalists which have since submitted technical proposals.

ODNR intends to hire a design firm in the Summer of 2015, complete design work in early Spring of 2016, and begin construction in early Summer of 2016. The entire process, including construction of a completely new dam, is expected to take approximately five years. During this time Buckeye Lake will be kept at the winter pool levels and will not need to be drained. The cost of the project is estimated to be

\$120 to \$150 million. Governmental entities have committed to funding the project, but specific funding mechanisms have not yet been established.

*The above information is based on information from the Ohio Department of Natural Resources website, and from an interview with Bethany McCorkle, Chief of Communications at ODNR, on May 7, 2015.*



# METHODOLOGY AND ASSUMPTIONS

## OVERVIEW

The lower water level, Dam construction, and public perceptions of these events will have negative economic and fiscal (government revenue generation) impacts on the Buckeye Lake area during the construction period and beyond. This report describes the process Silverlode used to gather data and estimate these impacts through a conservative, defensible approach based upon assumptions that were refined by a wide range of local stakeholders. Data was primarily compiled and reviewed from US Bureau of Labor Statistics, ESRI, and IMPLAN.

## STAKEHOLDER ENGAGEMENT

Dozens of civic, community, and business representatives from the Buckeye Lake area and surrounding region were interviewed to provide insights into the Buckeye Lake Dam project and its impacts. Representatives from the following groups were engaged:

### **Civic and Community Representatives**

Fairfield County Commissioners  
Licking County Commissioners  
Perry County Commissioners  
Columbus 2020  
Local Chambers of Commerce  
Municipal and County Economic Development officials  
Municipal Mayors  
County Auditors Offices  
Tourism Office

### **Business Owners and Representatives**

Retail Store and Restaurant Owners  
Campgrounds Representative  
Conservation Group Representative  
Homeowners Association Representatives  
Marina Owner  
Yacht Club Owner  
Realtors  
General Contractors  
Local Fishermen

## DATA COLLECTION AND ANALYSIS

The following four steps were taken to calculate the number of direct jobs which may be at risk during the Dam project.

### 1. Identification of the Direct Effect Study Area

The study area of this report is the State of Ohio and the three-county regional economy of Fairfield, Licking, and Perry Counties. The Direct Effect study area is the geography where actual jobs are most likely to be lost or not hired during the five-year construction period (“Study Period”). The Direct Effect study area, which includes all business establishments operating within close proximity to the Lake, was defined as comprising the Zip codes 43008, 43046, and 43076.

### 2. Identification of Impacted Industry Sectors

Industry sectors represented in the direct effect study area were identified by using the most current Zip code level data available from US Census Zip Code Business Patterns (2012) and IMPLAN Group (2013). The data sets were compared for consistency. There are almost 6,000 jobs, in nearly 200 different industry sectors, within the Direct Effect study area.

Of those 200 industry sectors, 31 sectors were identified as likely to be directly impacted by the lower Lake levels and Dam construction. There are approximately 1,200 jobs within these directly impacted sectors in the three Zip code area. The impacted sectors include the following and are described in *Appendix 3: Industry Sectors*.

NAICS	Description	NAICS	Description
23611	Residential Building Construction	453	Miscellaneous Store Retailers
236115	New Single-Family Housing Construction (except For-Sale Builders)	454	Nonstore Retailers
236116	New Multifamily Housing Construction (except For-Sale Builders)	531	Real Estate
31135	Chocolate and Confectionery Manufacturing	5418	Advertising, Public Relations, and Related Services
311520	Ice Cream and Frozen Dessert Manufacturing	712	Museums, Historical Sites, and Similar Institutions
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing	7139	Other Amusement and Recreation Industries
312120	Breweries	713940	Fitness and Recreational Sports Centers
Sector 42 --	Wholesale Trade	13950	Bowling Centers
441	Motor Vehicle and Parts Dealers	713910	Golf Courses and Country Clubs
443	Electronics and Appliance Stores	713990	All Other Amusement and Recreation Industries
444	Building Material and Garden Equipment and Supplies Dealers	721110	Hotels (except Casino Hotels) and Motels
445	Food and Beverage Stores	72121	RV (Recreational Vehicle) Parks and Recreational Camps
446	Health and Personal Care Stores	72119	Other Traveler Accommodation
447	Gasoline Stations	722	Food Services and Drinking Places
448	Clothing and Clothing Accessories Stores	811192	Car Washes
452	General Merchandise Stores		

### **3. Identification of Directly Impacted Jobs**

Interviews with businesses in the area, economic development professionals, other experts, and elected officials support the assumption that 40% to 70% of jobs (approximately 483 to 849 jobs) within these impacted industry sectors may be at risk (lost or temporarily lost) during the Dam project. For example, a restaurant that typically has ten employees during the summer may only have four to seven employees while the Lake levels are lower.

### **4. Review of Additional Relevant Data**

Additional data such as detailed reports on tourism, boating registrations and activity, events, etc. was also gathered and reviewed. A physical tour of the Lake and surrounding geography was also completed.

## **ADDITIONAL ASSUMPTIONS**

### **Seasonal Population**

The vast majority of the population which lives in close proximity to Buckeye Lake is a year-round population. There are some summer residents, but there is not a significant population shift between seasons. There is typically an influx of visitors during the summer months. As a result, while some of the establishments in the direct effect study area may go out of business, it appears most establishments will likely continue to operate at lower levels of employment to cater to the year-long population during the Dam project.

### **Property Values**

Under Ohio law, property is reappraised every six years, and property values are updated in the third year following the reappraisal. The next update for Fairfield County will occur in 2016, and Licking will complete a reappraisal in 2017. Perry County has relatively few parcels within the Direct Effect study area. In determining new values for parcels within a county, only historical data are considered. Auditors in Ohio do not engage in any forecasting or prediction for value setting, and new values are set based primarily on sales that have occurred during the prior approximately 54 months.

It is the auditors' opinion (as well as local real estate professionals) that the rate of sales of parcels will significantly decrease during the Study Period for those properties whose values may be impacted by being in close proximity to the Lake. For those probably few parcels that are sold during this period in an arm's length transaction, an appeal can be made to the auditor's office for an adjustment of the taxable value based on the sales price.

Because the approach to updates and reappraisals is based only on historic data and not on current or future events (such as the dam work), the auditors stated it is unlikely the updated values will be broadly impacted by the temporary work on the Dam. While some individual parcels that are sold during the Study Period may ultimately have their values lowered, the overall impact is not likely to be material.

This is not to in any way suggest that for those property owners forced to sell during the construction period, the impact will not be significant at the individual level. On a case by case basis, there are certain to be incidents of deep financial pain; however, when compared to the overall property base in the three-county region, the aggregate potential impact of the Dam construction will most likely not be material.

### **Study Period**

ODNR estimates that the project will take between three and five years, starting in the Spring of 2015. This study uses the conservative timeline of five years (the “Study Period”).

### **Recovery Period**

Assuming a five-year period of reduction in economic activity, it is not likely that at the end of that period, economic activity will immediately return to “normal” levels. While it is difficult to predict the longer term impacts this disruption may have, it is likely many of the businesses that are able to survive may face capital constraints, and the return to “normal” may take several more years.

## FINDINGS

As described above, based on interviews and data analysis, it was determined that 40% to 70% of jobs at establishments operating in the Direct Effect study area within certain industry sectors may be at risk of being lost or not hired during the Study Period. This range of 483 (“Low”) to 849 (“High”) direct jobs was modeled in IMPLAN to determine the fiscal and economic impacts of the Dam project on the economies of the three-county area (the “Region”) and the State of Ohio. Definitions for the terms used below can be found in *Appendix 1: Glossary and Methodology*. Please note that in all tables in this report such as those shown below, the values in rows may be summed and those totals are provided, but it is not appropriate to sum down the columns.

## REGIONAL IMPACTS

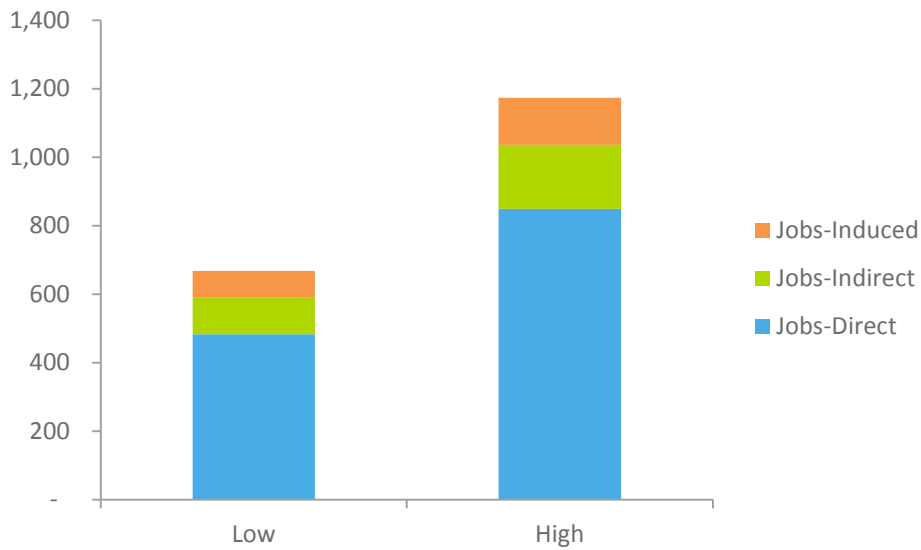
### SUMMARY TABLES –REGIONAL IMPACTS

	Estimated Five-year Impacts - Low			
	Direct	Indirect	Induced	Total
Jobs	483	106	78	668
Labor Income	\$ 61,995,000	\$ 16,765,000	\$ 12,910,000	\$ 91,670,000
Output	\$ 236,685,000	\$ 63,265,000	\$ 44,785,000	\$ 344,735,000
State and Local Taxes				\$ 24,015,000

	Estimated Five-year Impacts - High			
	Direct	Indirect	Induced	Total
Jobs	849	187	138	1,174
Labor Income	\$ 109,005,000	\$ 29,445,000	\$ 22,695,000	\$ 161,145,000
Output	\$ 416,015,000	\$ 111,125,000	\$ 78,725,000	\$ 605,865,000
State and Local Taxes				\$ 42,160,000

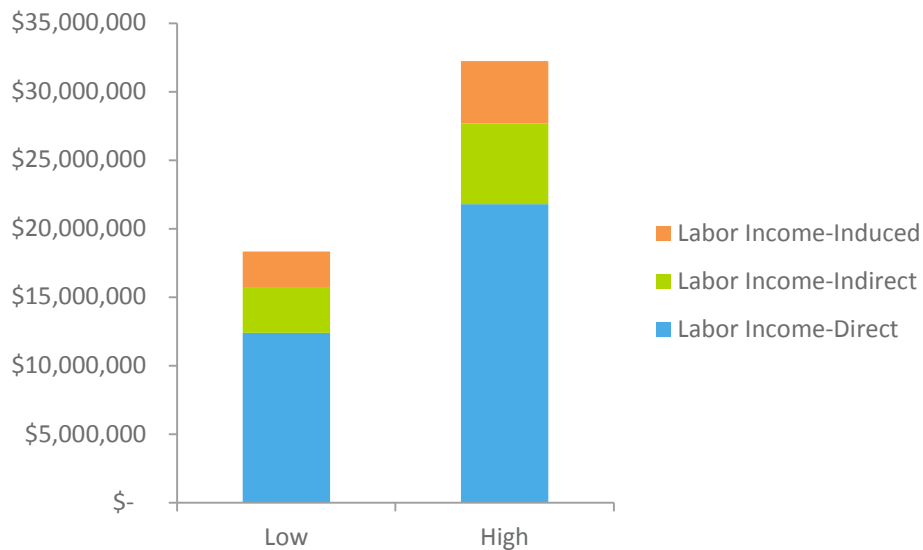
### Jobs

The direct job impact is estimated to be between 483 and 849. These direct jobs support additional indirect and induced jobs within the Region. In total, the job impact is expected to be between 668 and 1,174 during the study period. The chart below shows the estimated range of potential impacts by job categories.



### Labor Income

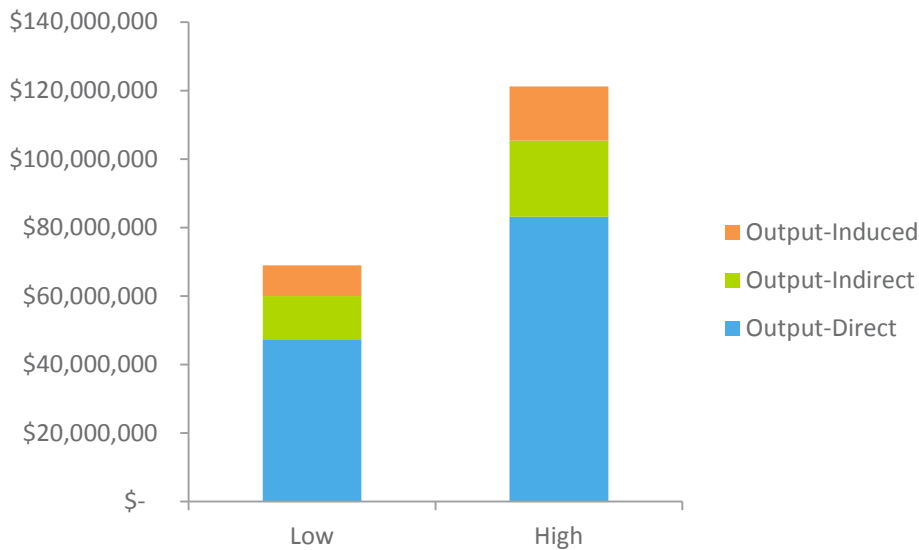
The jobs described above support labor income within the Region. The estimated annual direct labor income impact is estimated to be between \$12.4 million and \$21.8 million. When indirect and induced impacts are included, the total **annual** labor income impact in the Region will be between approximately \$18.3 million and \$32.2 million. The chart below shows these impacts. Note that these values represent potential annual impacts and the summary tables above include estimated cumulative impacts over the five-year study period.



Over the five-year study period, the total labor income loss (holding all dollars constant at 2015 values) will likely be in the range of \$91.7 million to \$161.1 million as shown in the table above.

### Output

Total industry output (a measure of total economic activity within a region) can also be estimated at the direct, indirect and induced levels. On an **annual** basis during the study period, the direct output decrease is estimated to be approximately \$47.3 million to \$83.2 million. Including indirect and induced effects brings that range to \$68.9 million to \$121.2 million **annually**, as shown in the chart below.



Over the five-year study period, the total **cumulative** output loss in the Region’s economy (holding all dollars constant at 2015 values) is estimated to be \$344.7 million to \$605.9 million as shown in the table above.

### State and Local Taxes

The economic activity described above generates a variety of state and local level taxes and fees. These include taxes on individual and corporate earnings, taxes on sales and property, fees for licenses, etc. Within the Region, the total **annual** state and local fiscal impacts are estimated to be approximately \$4.8 million to \$8.4 million. Over the five-year study period, the total state and local fiscal **cumulative** impact (holding all dollars constant at 2015 values) is estimated to be \$24.0 million to \$42.2 million.

# STATE OF OHIO IMPACTS

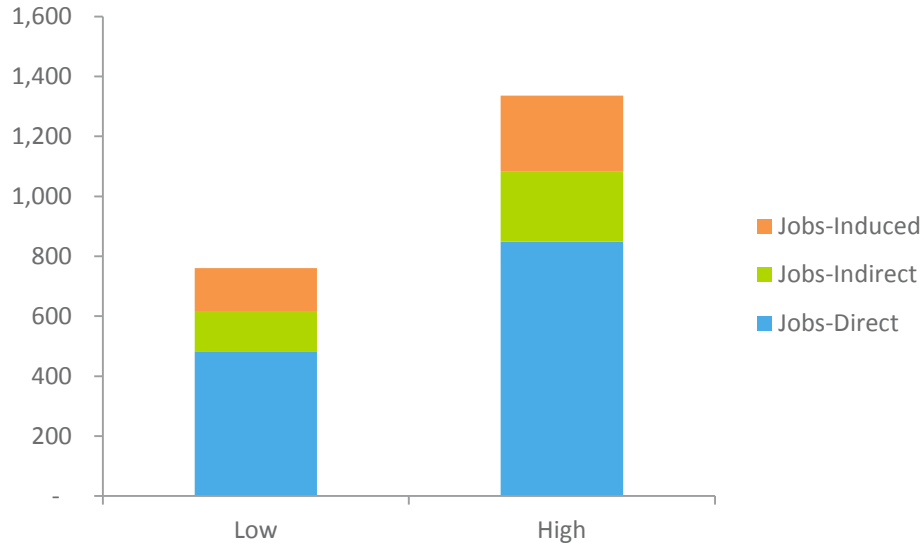
## SUMMARY TABLES – STATE OF OHIO IMPACTS

	Estimated Five-year Impacts - Low			
	Direct	Indirect	Induced	Total
Jobs	483	134	143	760
Labor Income	\$ 73,494,000	\$ 32,016,000	\$ 30,932,000	\$ 136,442,000
Output	\$ 248,673,000	\$ 100,314,000	\$ 95,637,000	\$ 444,624,000
State and Local Taxes				\$ 27,860,000

	Estimated Five-year Impacts - High			
	Direct	Indirect	Induced	Total
Jobs	849	235	251	1,336
Labor Income	\$ 129,056,000	\$ 56,225,000	\$ 54,318,000	\$ 239,599,000
Output	\$ 436,934,000	\$ 176,299,000	\$ 167,943,000	\$ 781,176,000
State and Local Taxes				\$ 48,903,000

### Jobs

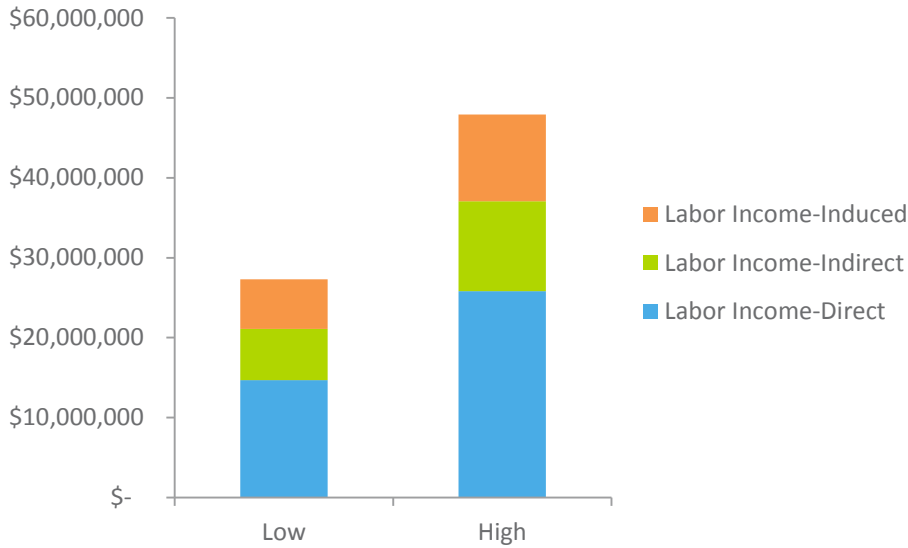
The direct job losses are not different when calculating impacts at the State of Ohio level, and as stated above are estimated to be between 483 and 849; however, due to the larger economy being modeled, the total impacts, including indirect and induced jobs, are estimated to be 760 to 1,336, as shown in the chart below.





**Labor Income**

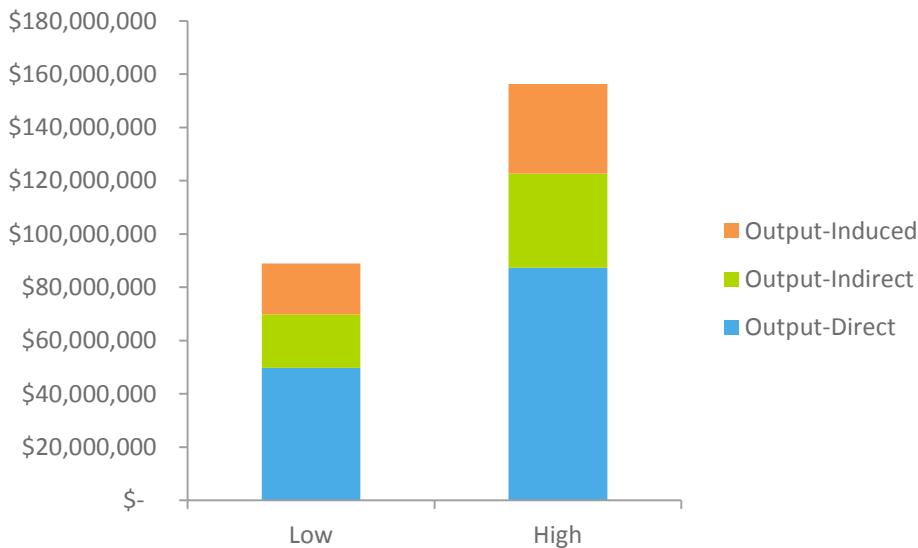
The jobs described above support labor income within the State. The estimated **annual** direct labor income impact is estimated to be between \$14.7 million and \$25.8 million. When indirect and induced impacts are included, the total **annual** labor income impact in the State is estimated to be between approximately \$27.3 million and \$47.9 million. The chart below shows these impacts.



Over the five-year study period, the total **cumulative** labor income impact at the State level (holding all dollars constant at 2015 values) is estimated to be \$136.4 million to \$239.6 million.

**Output**

At the State level, on an **annual** basis during the study period, the direct output impact is estimated to be approximately \$49.7 million to \$87.4 million. Including indirect and induced effects brings that range to \$88.9 million to \$156.2 million **annually**, as shown in the chart below.



Over the five-year study period, the total **cumulative** output impact at the State level (holding all dollars constant at 2015 values) is estimated to be \$444.6 million to \$781.2 million.

### **State and Local Taxes**

The economic activity described above generates a variety of state and local level taxes and fees. These include taxes on individual and corporate earnings, taxes on sales and property, fees for licenses, etc. Within the State of Ohio, the total **annual** state and local fiscal impacts is estimated to be approximately \$5.6 million to \$9.8 million. Over the five-year study period, the total **cumulative** state and local fiscal impact (holding all dollars constant at 2015 values) is estimated to be \$27.9 million to \$48.9 million.

## CONSTRUCTION SPENDING IMPACTS

This report assumes that \$150 million will be spent over five years. It is worth noting that it is not uncommon on large construction projects such as this to have a significant portion of the dollars spent go to construction companies and/or suppliers from outside of the Region. At this stage in the process, no construction contracts have been awarded, so it is not possible to determine local versus non-local spending. Construction spending such as this is temporary in nature and does not directly (i.e., job for job) offset the impacts presented above.

### Regional Impacts

**SUMMARY TABLE - REGIONAL CONSTRUCTION IMPACTS**

	Estimated Five-year Construction Impacts			
	Direct	Indirect	Induced	Total
Jobs	180	94	62	<b>336</b>
Labor Income	\$ 47,789,000	\$ 14,436,000	\$ 10,206,000	<b>\$ 72,431,000</b>
Output	\$ 150,000,000	\$ 48,849,000	\$ 35,401,000	<b>\$ 234,250,000</b>
State and Local Taxes				<b>\$ 8,655,000</b>

The total jobs (direct, indirect, and induced) supported by the Dam rebuild spending are estimated to be nearly 340 during the study period. This includes approximately 180 direct jobs that are required to complete the estimated \$30 million of construction activity that will occur per year during the construction period. These jobs will support approximately \$14.5 million of **annual** labor income within the region. The total **annual** economic output generated by the construction spending within the region will be approximately \$46.9 million. The fiscal impacts associated with the construction will be approximately \$1.7 million **per year** during the five-year project period. The **cumulative** impact values are summarized in the table above.

## State of Ohio Impacts

### SUMMARY TABLE - STATE OF OHIO CONSTRUCTION IMPACTS

	Estimated Five-year Construction Impacts			
	Direct	Indirect	Induced	Total
Jobs	168	117	107	391
Labor Income	\$ 53,407,000	\$ 25,480,000	\$ 23,133,000	\$ 102,020,000
Output	\$ 150,000,000	\$ 83,105,000	\$ 71,526,000	\$ 304,631,000
State and Local Taxes				\$ 11,665,000

At the State level, the construction impacts comprise a total of approximately 390 jobs, \$20.4 million of **annual** labor income, \$60.9 million of **annual** output, and \$2.3 million of **annual** state and local taxes and fees. The **cumulative** impact values are summarized in the table above.

# APPENDIX 1: GLOSSARY AND METHODOLOGY

## Jobs

- **Direct Jobs** – In this report, direct jobs comprise jobs within identified industry sectors located in the three Zip code Direct Effect study area.
- **Indirect Jobs** – Jobs supported by industries purchasing from industries. This cycle may have many iterations between different industry sectors, and the coefficients associated with each industry are calculated within the IMPLAN model. See below for more information about IMPLAN.
- **Induced Jobs** – Whereas indirect jobs are those positions that are created by industries purchasing from industries, induced jobs are those positions supported by household level purchasing, or the spending on goods and services by individuals within the region. In this report, induced jobs are also calculated using the IMPLAN model.

## Earnings

- **Labor Income** – The wages and benefits associated with the direct jobs, including proprietor income.
- **Indirect Labor Income** – The wages and benefits associated with the indirect jobs. This amount can include both worker pay as well as income earned by business owners. Indirect earnings are calculated using the IMPLAN model.
- **Induced Labor Income** – The earnings associated with the induced jobs. This amount can include both wages and benefits paid to workers as well as income earned by business owners. In this report, induced earnings are also calculated using the IMPLAN model.

## Taxes

- **State and Local Taxes** – All taxes and fees collected at state or local government levels, including taxes on individual and corporate earnings, taxes on sales and property, fees for licenses and registrations, etc.

## Output

- **Direct, Indirect, and Induced Industry Output** – Represents the total value of all goods and services produced by all of the industries within the study region. For this study, we used the IMPLAN model, which provides information for more than 500 distinct industry sectors. By aggregating the changes in each sector associated with the direct activity in the direct effect study area, the model is able to calculate the total impact on the economy.

## APPENDIX 2: ABOUT IMPLAN ECONOMIC IMPACT ANALYSIS

Portions of this analysis were completed using the IMPLAN economic impact model. The IMPLAN model is used by more than 1,000 universities and government agencies to estimate the economic and fiscal impacts of investments and/or changes in industry, to forecast tax revenue and employment generation, and to conduct economic comparison studies of two or more geographic locations.

IMPLAN is an input-output model. Input-output accounting describes commodity flows from producers to intermediate and final consumers. The total industry purchases of commodities, services, employment compensation, value added, and imports are equal to the value of the commodities produced.

An IMPLAN impact analysis involves specifying a series of expenditures or other changes and applying them to the region's economic multipliers. The expenditures are identified in terms of the sectoring scheme for the model; in producer prices; and in historical dollars with the current year used as a base year. Only the dollars spent within the region are applied to the model.

The notion of a multiplier rests upon the difference between the initial effect of a change in final demand and the total effects of that change. Total effects can be calculated either as direct and indirect effects, or as direct, indirect, and induced effects. Direct effects are production changes associated with the immediate effects or final demand changes. Indirect effects are production changes in backward-linked industries caused by the changing input needs of directly affected industries (for example, additional purchases to produce additional output). Induced effects are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects.

Purchases for final use (final demand) drive the model. Industries producing goods and services for final demand purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues until leakage from the region (imports and value added) stops the cycle.

These indirect and induced effects (the effects of household spending) can be mathematically derived. The resulting sets of multipliers describe the change of output for each and every regional industry caused by a one-dollar change in final demand for any given industry.

Creating a regional input-output model requires a tremendous amount of data. The costs of surveying industries within each region to derive a list of commodity purchases (production functions) are prohibitive. IMPLAN was developed as a cost-effective means to develop regional input-output models. The IMPLAN accounts closely follow the accounting conventions used in the "Input-Output Study of the U.S. Economy" by the Bureau of Economic Analysis (1980) and the rectangular format recommended by the United Nations.

*(Source for much of this description: Olson, Doug and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc., 1725 Tower Drive West, Suite 140, Stillwater, MN 55082)*

## APPENDIX 3: DIRECTLY IMPACTED INDUSTRY SECTORS

The following industry sector descriptions are from the US Census Bureau  
<http://www.census.gov/eos/www/naics/>

### **23611 Residential Building Construction**

This industry comprises establishments primarily responsible for the construction or remodeling and renovation of single-family and multifamily residential buildings. Included in this industry are residential housing general contractors (i.e., new construction, remodeling, or renovating existing residential structures), for-sale builders and remodelers of residential structures, residential project construction management firms, and residential design-build firms.

### **236115 New Single-Family Housing Construction (except For-Sale Builders)**

This U.S. industry comprises general contractor establishments primarily responsible for the entire construction of new single-family housing, such as single-family detached houses and town houses or row houses where each housing unit (1) is separated from its neighbors by a ground-to-roof wall and (2) has no housing units constructed above or below. This industry includes general contractors responsible for the on-site assembly of modular and prefabricated houses. Single-family housing design-build firms and single-family construction management firms acting as general contractors are included in this industry.

### **236116 New Multifamily Housing Construction (except For-Sale Builders)**

This U.S. industry comprises general contractor establishments primarily responsible for the construction of new multifamily residential housing units (e.g., high-rise, garden, town house apartments, and condominiums where each unit is not separated from its neighbors by a ground-to-roof wall). Multifamily design-build firms and multifamily housing construction management firms acting as general contractors are included in this industry.

### **31135 Chocolate and Confectionery Manufacturing**

This industry comprises establishments primarily engaged in (1) manufacturing chocolate and chocolate confectioneries from cacao beans, or (2) manufacturing chocolate confectioneries from chocolate produced elsewhere. Included in this industry are establishments primarily engaged in retailing chocolate confectionery products not for immediate consumption made on the premises from chocolate made elsewhere.

### **311520 Ice Cream and Frozen Dessert Manufacturing**

This industry comprises establishments primarily engaged in manufacturing ice cream, frozen yogurts, frozen ices, sherbets, frozen tofu, and other frozen desserts (except bakery products).



### **311813 Frozen Cakes, Pies, and Other Pastries Manufacturing**

This U.S. industry comprises establishments primarily engaged in manufacturing frozen bakery products (except bread), such as cakes, pies, and doughnuts.

### **312120 Breweries**

This industry comprises establishments primarily engaged in brewing beer, ale, malt liquors, and nonalcoholic beer.

## **Sector 42 -- Wholesale Trade**

The Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing.

The wholesaling process is an intermediate step in the distribution of merchandise. Wholesalers are organized to sell or arrange the purchase or sale of (a) goods for resale (i.e., goods sold to other wholesalers or retailers), (b) capital or durable nonconsumer goods, and (c) raw and intermediate materials and supplies used in production.

Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. These warehouses and offices are characterized by having little or no display of merchandise. In addition, neither the design nor the location of the premises is intended to solicit walk-in traffic. Wholesalers do not normally use advertising directed to the general public. Customers are generally reached initially via telephone, in-person marketing, or by specialized advertising that may include Internet and other electronic means. Follow-up orders are either vendor-initiated or client-initiated, generally based on previous sales, and typically exhibit strong ties between sellers and buyers. In fact, transactions are often conducted between wholesalers and clients that have long-standing business relationships.

This sector comprises two main types of wholesalers: merchant wholesalers that sell goods on their own account and business-to-business electronic markets, agents, and brokers that arrange sales and purchases for others generally for a commission or fee.

(1) Establishments that sell goods on their own account are known as wholesale merchants, distributors, jobbers, drop shippers, and import/export merchants. Also included as wholesale merchants are sales offices and sales branches (but not retail stores) maintained by manufacturing, refining, or mining enterprises apart from their plants or mines for the purpose of marketing their products and group purchasing organizations (e.g., purchasing and selling goods on their own account). Merchant wholesale establishments typically maintain their own warehouse, where they receive and handle goods for their customers. Goods are generally sold without transformation, but may include integral functions, such as sorting, packaging, labeling, and other marketing services.

(2) Establishments arranging for the purchase or sale of goods owned by others or purchasing goods, generally on a commission basis are known as business-to-business electronic markets, agents and brokers, commission merchants, import/export agents and brokers, auction companies, group purchasing organization (e.g., purchasing or arranging for the purchases of goods owned by others), and manufacturers' representatives. These establishments operate from offices and generally do not own or handle the goods they sell.

Some wholesale establishments may be connected with a single manufacturer and promote and sell the particular manufacturers' products to a wide range of other wholesalers or retailers. Other wholesalers may be connected to a retail chain, or limited number of retail chains, and only provide a variety of products needed by that particular retail operation(s). These wholesalers may obtain the products from a wide range of manufacturers. Still other wholesalers may not take title to the goods, but act as agents and brokers for a commission.

Although, in general, wholesaling normally denotes sales in large volumes, durable nonconsumer goods may be sold in single units. Sales of capital or durable nonconsumer goods used in the production of goods and services, such as farm machinery, medium- and heavy-duty trucks, and industrial machinery, are always included in wholesale trade.

#### **441 Motor Vehicle and Parts Dealers**

Industries in the Motor Vehicle and Parts Dealers subsector retail motor vehicles and parts from fixed point-of-sale locations. Establishments in this subsector typically operate from a showroom and/or an open lot where the vehicles are on display. The display of vehicles and the related parts require little by way of display equipment. The personnel generally include both the sales and sales support staff familiar with the requirements for registering and financing a vehicle as well as a staff of parts experts and mechanics trained to provide repair and maintenance services for the vehicles. Specific industries have been included in this subsector to identify the type of vehicle being retailed. Note: this sector includes boat dealers.

#### **443 Electronics and Appliance Stores**

Industries in the Electronics and Appliance Stores subsector retail new electronics and appliances from point-of-sale locations. Establishments in this subsector often operate from locations that have special provisions for floor displays requiring special electrical capacity to accommodate the proper demonstration of the products. The staff includes sales personnel knowledgeable in the characteristics and warranties of the line of goods retailed and may also include trained repair persons to handle the maintenance and repair of the electronic equipment and appliances. The classifications within this subsector are made principally on the type of product and knowledge required to operate each type of store.

#### **444 Building Material and Garden Equipment and Supplies Dealers**

Industries in the Building Material and Garden Equipment and Supplies Dealers subsector retail new building material and garden equipment and supplies from fixed point-of-sale locations. Establishments in this subsector have display equipment designed to handle lumber and related products and garden equipment and supplies that may be kept either indoors or outdoors under covered areas. The staff is usually knowledgeable in the use of the specific products being retailed in the construction, repair, and maintenance of the home and associated grounds.

#### **445 Food and Beverage Stores**

Industries in the Food and Beverage Stores subsector usually retail food and beverage merchandise from fixed point-of-sale locations. Establishments in this subsector have special equipment (e.g., freezers, refrigerated display cases, refrigerators) for displaying food and beverage goods. They have staff trained in the processing of food products to guarantee the proper storage and sanitary conditions required by regulatory authority.

#### **446 Health and Personal Care Stores**

Industries in the Health and Personal Care Stores subsector retail health and personal care merchandise from fixed point-of-sale locations. Establishments in this subsector are characterized principally by the products they retail, and some health and personal care stores may have specialized staff trained in dealing with the products. Staff may include pharmacists, opticians, and other professionals engaged in retailing, advising customers, and/or fitting the product sold to the customer's needs.

#### **447 Gasoline Stations**

Industries in the Gasoline Stations subsector retail automotive fuels (e.g., gasoline, diesel fuel, gasohol, alternative fuels) and automotive oils or retail these products in combination with convenience store items. These establishments have specialized equipment for the storage and dispensing of automotive fuels.

#### **448 Clothing and Clothing Accessories Stores**

Industries in the Clothing and Clothing Accessories Stores subsector retail new clothing and clothing accessories merchandise from fixed point-of-sale locations. Establishments in this subsector have similar display equipment and staff that is knowledgeable regarding fashion trends and the proper match of styles, colors, and combinations of clothing and accessories to the characteristics and tastes of the customer.

#### **452 General Merchandise Stores**

Industries in the General Merchandise Stores subsector retail new general merchandise from fixed point-of-sale locations. Establishments in this subsector are unique in that they have the equipment and staff capable of retailing a large variety of goods from a single location. This includes a variety of display equipment and staff trained to provide information on many lines of products.

#### **453 Miscellaneous Store Retailers**

Industries in the Miscellaneous Store Retailers subsector retail merchandise from fixed point-of-sale locations (except new or used motor vehicles and parts; new furniture and home furnishings; new appliances and electronic products; new building materials and garden equipment and supplies; food and beverages; health and personal care goods; gasoline; new clothing and accessories; and new sporting goods, hobby goods, books, and music). Establishments in this subsector include stores with unique characteristics like florists, used merchandise stores, and pet and pet supply stores as well as other store retailers.

#### **454 Nonstore Retailers**

Industries in the Nonstore Retailers subsector retail merchandise using methods, such as the broadcasting of infomercials, the broadcasting and publishing of direct-response advertising, the publishing of paper and electronic catalogs, door-to-door solicitation, in-home demonstration, selling from portable stalls and distribution through vending machines. Establishments in this subsector include mail-order houses, vending machine operators, home delivery sales, door-to-door sales, party plan sales, electronic shopping, and sales through portable stalls (e.g., street vendors, except food). Establishments engaged in the direct sale (i.e., nonstore) of products, such as home heating oil dealers and newspaper delivery service providers are included in this subsector.

#### **531 Real Estate**

Industries in the Real Estate subsector group establishments that are primarily engaged in renting or leasing real estate to others; managing real estate for others; selling, buying, or renting real estate for others; and providing other real estate related services, such as appraisal services.

#### **5418 Advertising, Public Relations, and Related Services**

Industries including establishments engaged in advertising services, public relations, media representation, outdoor advertising, direct mail advertising, etc.

#### **712 Museums, Historical Sites, and Similar Institutions**

Industries in the Museums, Historical Sites, and Similar Institutions subsector engage in the preservation and exhibition of objects, sites, and natural wonders of historical, cultural, and/or educational value.

#### **7139 Other Amusement and Recreation Industries**

Industries including establishments such as marinas, golf courses, fitness and recreational sports centers, bowling centers, etc. as further defined below.

#### **713940 Fitness and Recreational Sports Centers**

This industry comprises establishments primarily engaged in operating fitness and recreational sports facilities featuring exercise and other active physical fitness conditioning or recreational sports activities, such as swimming, skating, or racquet sports.

**13950 Bowling Centers**

This industry comprises establishments engaged in operating bowling centers. These establishments often provide food and beverage services.

**713910 Golf Courses and Country Clubs**

This industry comprises (1) establishments primarily engaged in operating golf courses (except miniature) and (2) establishments primarily engaged in operating golf courses, along with dining facilities and other recreational facilities that are known as country clubs. These establishments often provide food and beverage services, equipment rental services, and golf instruction services.

**713990 All Other Amusement and Recreation Industries**

This industry comprises establishments (except amusement parks and arcades; gambling industries; golf courses and country clubs; skiing facilities; marinas; fitness and recreational sports centers; and bowling centers) primarily engaged in providing recreational and amusement services.

**721110 Hotels (except Casino Hotels) and Motels**

This industry comprises establishments primarily engaged in providing short-term lodging in facilities known as hotels, motor hotels, resort hotels, and motels. The establishments in this industry may offer food and beverage services, recreational services, conference rooms and convention services, laundry services, parking, and other services.

**72121 RV (Recreational Vehicle) Parks and Recreational Camps**

This industry comprises establishments primarily engaged in operating recreational vehicle parks and campgrounds and recreational and vacation camps. These establishments cater to outdoor enthusiasts and are characterized by the type of accommodation and by the nature and the range of recreational facilities and activities provided to their clients.

**72119 Other Traveler Accommodation**

This industry comprises establishments primarily engaged in providing short-term lodging (except hotels, motels, and casino hotels).

**722 Food Services and Drinking Places**

Industries in the Food Services and Drinking Places subsector prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption. There is a wide range of establishments in these industries. Some provide food and drink only; while others provide various combinations of seating space, waiter/waitress services and incidental amenities, such as limited entertainment. The industries in the subsector are grouped based on the type and level of services provided. The industry groups are special food services, such as food service contractors, caterers, and mobile food services; drinking places; and restaurants and other eating places.

**811192 Car Washes**

This U.S. industry comprises establishments primarily engaged in cleaning, washing, and/or waxing automotive vehicles, such as passenger cars, trucks, and vans, and trailers.