

REGIONAL ECONOMIC ASSESSMENT  
OF PROPOSED FLOOD PROTECTION  
PROJECTS IN MOOREFIELD, WV

BY

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FOR

INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

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## INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

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1.0 EXECUTIVE SUMMARY

This study estimated the regional and local economic impacts resulting from the construction and subsequent operation and maintenance of a flood protection project for the town of Moorefield, West Virginia. This project would provide the town with a "100 year level" of flood protection. Estimated impacts are distributed amongst businesses, industry, government and labor.

Separate assessments were made to estimate the annual short term impacts to the whole state of West Virginia and to Hardy County from the purchase of materials, supplies and labor during the construction phase and long-term impacts from the expenditures for the operation and maintenance of the levees.

Estimates of regional economic impacts were determined using input/output (I/O) analysis. The analysis was conducted using Micro IMPLAN, a personal computer version of a national I/O, model, IMPLAN developed by the U. S. Forest Service.

Total construction cost are projected to be \$12.048 million. Excluding the costs for engineering and design and construction management, total construction cost used for estimating impacts was \$9.123 million. A construction period of 3 years has been established for the proposed flood protection project. Thus, total annual construction costs were valued at \$3.041 million.

IMPACTS TO STATE:

When considering the combined purchase of materials, supplies, and labor, estimated impacts from annual construction costs yielded the following results:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Direct Impact	3.1957	0.8989	0.5232	1.4221	1.5368	0.1147
Indirect Impact	0.7988	0.2284	0.1232	0.3517	0.3767	0.0250
Induced Impact	0.7313	0.2384	0.1866	0.4250	0.4812	0.0562
Total Impact	4.8334	1.3656	0.8330	2.1987	1.3947	0.1960

These results show that from \$3.041 million of activity related to the purchase of materials and wages to labor, \$4.8334 worth of total regional industry output, would result. This represents an additional \$1.6377 million over the amount spent directly for the construction related activities. There was also an additional \$1.3656 million of income to employees in all industries and \$0.1960 additional indirect business taxes produced.

The impact from, only purchasing construction materials was:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	4.4145	1.2466	0.7399	1.9864	2.1545	0.1681

Thus, the purchase of construction material related to total construction costs of \$3.041 million, generated \$4.4145 million of the \$4.83 million of industry output throughout the state of West Virginia. This represents 91% of the total estimated impacts.

Estimates of total impacts from wages paid to labor are:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	0.4155	0.1180	0.0925	0.2105	0.2384	0.0279

Impacts from labor's wages result from the direct and indirect effects of the purchase of household goods and services within the study region. It is estimated that an additional \$0.4155 million of industry output and \$0.118 million in income to employees in other industries would occur as a result of the wages paid to construction labor.

The long term impacts resulting from this project are associated with the costs for routine operation and maintenance (O&M). These costs have been projected to be \$66,000 annually. There was no separation of these annual costs into categories for materials and labor. Resulting estimates of annual impacts are:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	0.0964	0.0329	0.0078	0.0406	0.0428	0.0022

From annual O&M expenditure of \$66,000, it is estimated that there will be \$96,400 worth of gross output from industries within the state, This represents an additional regional gross output valued at \$30,400 above that required for operation and maintenance activities along with \$32,900 in wages earned and \$2,200 in indirect business taxes paid to government.

IMPACTS TO HARDY COUNTY:

Estimated annual impacts presented below represent the purchase of construction materials combined with labor's purchase of goods and services.

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Direct Impact	3.0677	0.8603	0.4984	1.3586	1.4668	0.1082
Indirect Impact	0.2486	0.0939	0.0764	0.1359	0.1438	0.0079
Induced Impact	0.3385	0.0938	0.0821	0.1760	0.2049	0.0289
Total Impact	3.6549	1.0480	0.6225	1.6705	1.8155	0.1450

As shown by these results, annual construction expenditures of \$3.041 million for materials and labor would produce additional gross industry output to Hardy County valued at \$3.66 million or an additional \$0.6139 of output for industries within the county. These total construction expenditures would also produce \$1.05 million in new employee wages and \$0.145 million of indirect business taxes to the government.

The annual expenditure for only construction materials and supplies would generate the following estimated impacts.

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	3.4684	.9963	.5773	1.5736	1.7026	.1290

The \$3.4684 million in additional gross output in Hardy County would yield an annual increase of \$0.9963 million in wages to the county and \$0.1290 million in indirect business taxes.

An estimate was made of the impact to Hardy County from the purchase of household goods and services with wages earned by the construction labor. These impacts added to those estimates from the expenditure for construction materials, constitute the value of estimated impacts from all input expenditures. Total impacts to all other industries from the spending of labor's wages are:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	0.1859	0.0515	0.0451	0.0967	0.1125	0.0158

It is estimated that an additional \$0.1859 million of industry output would result. From the manufacturing and sales of these goods, there would be employee wages earned estimated to be \$0.0515 million and \$0.0451 million and \$0.0451 million of income to business and property owners.

Long term impacts to Hardy County from the flood protection projects in Moorefield, West Virginia arise from the annual expenses for operation and maintenance of the levees. These costs of \$66,000, would produce the following yearly impacts to the county:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Direct Impact	0.0692	0.0188	0.0032	0.0221	0.0233	0.0011
Indirect Impact	0.0063	0.0024	0.0010	0.0036	0.0038	0.0002
Induced Impact	0.0049	0.0014	0.0011	0.0025	0.0030	0.0005
Total Impact	0.0803	0.0227	0.0055	0.0282	0.0301	0.0018

An additional \$14,300 worth of gross output would be produced annually from the O&M expenses for the levees. From these expenses there would be an additional \$22,700 of employee income and \$1,800 of indirect business taxes within Hardy County.

## REGIONAL ECONOMIC ASSESSMENT OF PROPOSED FLOOD PROTECTION PROJECTS IN MOOREFIELD, WEST VIRGINIA

### 2.0 INTRODUCTION

#### 2.1 Purpose of Study

This report presents the findings of a regional economic impact assessments of flood protection projects for the town of Moorefield, West Virginia. This project represents the recommendations contained in the Corps of Engineers Reconnaissance Studies for this town.

#### 2.2 Study Background

The South Branch Potomac River and its tributary system have experienced frequent flooding which has caused costly damages to personal properties and businesses along its banks. Average annual flood damages to the towns of Moorefield and Petersburg, West Virginia has been approximately \$3.4 million per year. The most recent flood in the South Branch occurred in November of 1985 and caused considerable damage to Moorefield in Hardy County West Virginia. Damages in Moorefield resulting from the November flood were estimated to be nearly \$30 million. Because of the continual flooding along this portion of the Potomac River and the magnitude of the resulting damages, the Baltimore District, U. S. Army Corps of Engineers initiated the planning process to determine if a local flood protection project was justified.

The Corps of Engineers (COE) planning process for such local flood protection projects consists of two phases: a reconnaissance phase and a feasibility phase. The objectives of the reconnaissance phase are to: identify applicable flood control solutions; estimate project costs, benefits and other impacts in light of current conditions; determine whether planning should proceed further into the feasibility phase, based on an appraisal of Federal interest; and assess the nonfederal sponsor's support for the potential solutions.

The objectives of the second or feasibility phase of the planning process are to: evaluate the specific engineering, environmental and economic effects of the preferred solutions; identify the optimum flood control project for the target area from both a federal and nonfederal perspective; and, recommend a project for construction, if justified and supported by nonfederal sponsors.

Responding to these flooding problems in Moorefield, West Virginia, the Corps of Engineers (COE) initiated a study in October of 1986 (COE, 1987). The result of the study has indicated that there are several favorable solutions which would involve some combination of earthen levees along the banks of the river and channel modifications in the river. A preliminary economic assessment of these projects has established the construction cost for these projects between \$8.7 and \$29.6 million for Moorefield. An assessment of benefits from these projects was made, but benefits was defined only in terms of the value of damages prevented by the reduction in the expected flood damages (if the projects were not built) and did not take into consideration any indirect or induced economic benefits.

### 2.3 Study Objectives

The objectives of this study are to estimate the regional and local economic impacts resulting from construction, operation and maintenance of the recommended flood protection projects for the town of Moorefield, West Virginia. Impacts are expected to be distributed amongst the various locales (e.g., county and state) and sectors (e.g., businesses, industry, government and labor) affected by the projects. The scope of the study was limited to:

1. economic impacts resulting from construction, operation and maintenance activities; and
2. economic impacts to the local/regional economy, resulting from provision of flood protection.

Impacts to the nation (i.e., increases in net income or decreases in flood damages) are evaluated by the COE and are not part of this study.

### 2.4 Study Approach

Estimates of regional economic impact were determined using input/output (I/O) analysis. The analysis was conducted using Micro IMPLAN, a personal computer version of a national I/O, model, IMPLAN developed by the U. S. Forest Service. (See Section 3.4).

Input-output studies are able to evaluate the impact (value of the change to all other industries in the region) from a change (increase or decrease) in a dollar's worth of final demand for the product of a target industry. Impacts include the change in gross output, employee incomes, business taxes and value added in all industries within the study region. These impacts are measured as the direct, indirect, induced and total effects of the changes in the target industry.

Direct effects are those which occur to those industries which sell products or services directly to the target industry. Indirect effects are the sale of goods and services necessary to provide the goods and services required for activities in the target industry. The employees of those industries providing direct or indirect goods or services, as well as those working the target industry, earn wages that are spent in their local communities to buy household goods and services. The economic activity generated from this creates the induced effects.

Separate estimates of regional impacts were made for both short-term impacts (i.e., those resulting from construction activities), and long-term impacts (i.e., those resulting from operation and maintenance of the project). Annual short-term impacts were estimated for the construction period (1993-1995); long-term benefits were presented as annualized values. The period of analysis for calculation of long-term impacts was for 25 years from completion of construction (currently scheduled for 1995). The annualization factor used in the analysis was 8-5/8%. All impacts were measured in October 1988 dollars. Final estimates of benefits were prepared in a LOTUS 1-2-3 spread sheet in order to allow updating as more detailed information is available.

The analysis of regional economic benefits of the projects addresses:

- Employment
- Earnings
- Sales/Output

#### Employment

Short and long-term employment were estimated, by industry, based on Corps of Engineers' estimates of labor required to construct, operate and maintain the project. Secondary employment (i.e., employment in nonconstruction trades) was also estimated by use of the Micro IMPLAN system.

#### Earnings:

Estimates of total additional earnings resulting from the construction and operation of the flood protection project, by industry, were determined based on Micro IMPLAN coefficients.

#### Sales/output:

It was anticipated that construction and operation of the flood protection project would result in increased local sales of goods and services. The dollar value of increased sales was estimated for the categories described below. In each case, estimated total additional sales, in the State of West Virginia, and in Hardy county were made.

- 1) Direct short-term sales/output were calculated as the cost to purchase the materials, supplies and equipment required to construct the project.
- 2) Direct long-term sales/output were calculated as the cost to purchase the materials, supplies and equipment required to operate and maintain the project.
- 3) Secondary and indirect short-term sales/output included the cost of purchases by the vendors of construction materials, supplies and equipment; as well as purchases for household goods and services from the additional wages and salaries generated by the construction. The value of these sales/output was determined by use of Micro IMPLAN output response coefficients. As previously mentioned, all estimates were broken down into the portion of sales/output accruing to county and state.

- 4) Secondary and indirect long-term sales/output included the cost of purchases by the vendors of the materials, supplies and equipment required to operate and maintain the project; as well as purchases made by operations and maintenance personnel. As previously mentioned, all estimates were broken down into the portion of sales accruing to county and state.

### 3.0 METHODOLOGY

#### 3.1 Background

Regional impact analysis estimates the changes in various business characteristics resulting from changes in the value of the final demand for the product produced by a target industry. One method of estimating the impact of these production changes on other industries within the region, has been with the use of regional input-output analysis. Economists have used input-output (I/O) analysis for nearly 50 years as part of regional impact evaluations (Richardson, 1972). Its use has been to evaluate the changes in the interindustry flow of goods as well as the resulting changes in income and employment within a defined region caused by a unit change in the value of the final demand for the output of a designated industry. Input-output (I/O) analysis describes the interaction of three elements of the economic system: final demand, gross output and input requirements. The purpose of the analysis is to determine the effect (direct, indirect and induced) on gross output in all industries within an economy from specified changes in final demand.

#### 3.2 Categories of Impacts

Input-output studies are able to estimate the impact (value of the change to all other industries in the region) from a change in the dollar value (increase or decrease) of production in a target industry. Impacts include the change in gross output, incomes, business taxes and value added in all industries (See Section 3.4). These impacts are measured as the direct, indirect, induced and total effects of the changes in the target industry (Palmer, et al., 1985).

Direct effects are those which occur to those industries which sell products or services directly to a target industry such as construction. These products or services are usually a necessary and vital part of the construction activity. Indirect effects are the sale of goods and services necessary to provide the goods and services required for construction. The purchase of raw materials to fabricate metal products or manufacture equipment is an example of indirect effects. The employees of those industries providing direct or indirect goods or services, as well those working in the construction trades, earn wages that are spent in their local communities to buy household goods and services. The economic activity generated from this creates the induced effects. The addition of all of these effects for each category, such as gross output or incomes, provides the total effects.

#### 3.3 I/O Assumptions & Limitations

Several assumptions about the relationship of industries are inherent in the use of all input output models (Chenery and Clark, 1959). These assumptions as related to this study can be summarized as follows:



- \* Each product is supplied as if by a single producer;
- \* Each product is produced using the same inputs in the same fixed proportions;
- \* The amount of inputs purchased by each industry is related only to its level of output;
- \* Unless otherwise specified, purchases of supplies by any industry is only from other industries within the region; and,
- \* Production of construction products or activities is based upon national averages of production technology and costs.

These assumptions thus rule out multiproduct plants, eliminate factor substitution (i.e., no change in the number of workers), imply constant returns to scale and consider that there are no economies of scale nor any external economies or diseconomies. Additionally, these assumptions require that any change in output result from a correspondingly proportional change in all inputs.

### 3.4 The Implan Model

The U.S. Forest Service has selected input-output analysis as the means of satisfying a requirement of the National Forest Management Act of 1976 (P.L. 94588) and subsequent implementing regulations (36 C.F.R. 219, Subpart A, September, 1979) for economic analysis of proposed forestry plans. Their system, IMPLAN (Impact analysis for Planning), is a database of economic information from secondary sources combined with a computer software system to perform the necessary computations which produce regional (nonsurvey) input-output models. Regions can be defined as large as the United States or as small as an individual county in any state. This model has now been made available for use on personal computers. Micro IMPLAN is available for use by other federal and state government agencies and was the I/O model used in this study.

The IMPLAN data base consists of two major parts: (1) a national level technology matrix and (2) estimates of sectorial activity for final demand, final payments, gross output and employment for each county. The present version is based on the 1982 census and contains 528 industry sectors. The technology matrix is derived from the 1982 national input output model of the U.S. Department of Commerce and denotes sectorial production functions used to provide the estimates of local purchases and sales (Alward and Palmer, 1983). Gross output, employment estimates and other necessary data were compiled from published censuses, industry statistics and existing economic studies.

The results of the I/O analyses from IMPLAN provide an assessment of the changes in specific categories in all industries. These categories are:

- \* **Total Gross Outputs (GO):** the sales of each industry to every other industry in the region and sales outside the region.
- \* **Employee Income (EI):** Wages and salaries earned by workers.

- \* **Property Income (PI):** Profits, rents, royalties, interest, etc. accruing to property owners and firms generated from the outputs of the industry.
- \* **Total Income (TI):** The sum of EI and PI.
- \* **Value Added (VA):** The sum of all forms of employee, property and business incomes. The difference between VA and TI is indirect business taxes (taxes paid when purchasing goods and services used in their production process) paid to the government.

Changes in each of these categories are developed for each industry in the region impacted by a change (increase or decrease) in the value of the final demand for construction. The amount of direct, indirect or induced changes that result are represented by a number referred to as an industry response coefficient. Adding all of the coefficients for all industries in each of the direct, indirect and induced categories provides corresponding regional response coefficients. These regional response coefficients are used in a similar fashion as an industry multiplier. When multiplied by the dollar value of the change in the construction industry, the results show the dollar value of the changes to all industries in the region in each specified category. These derived multipliers are what provide the ability for analyzing short term impacts and making long range forecasts. This is the attractiveness of I/O analysis. Multipliers distinguish between initial effects of a change in final demand (the direct purchase) and the total or "ripple" effects of that change. That is to say, they show how the initial effects from a change in final demand generates economic activity in other industries, which in turn generates more economic activity, which keeps rippling through the region.

For clarity of presentation, the 528 separate IMPLAN industries have been aggregated into fewer sectors. These are presented in Table III-1. Aggregation of industries was based upon similarity of product as determined by their Standard Industrial Codes (SIC) and their relationship to activities in the construction of earthen levees. Industries anticipated to be impacted by construction activities were left as disaggregated as possible. Impact values for industry sectors were then added together in the groupings represented in Table III-1. Appendix A provides a summary of the aggregation scheme used for the study. It should be emphasized that the values presented in this discussion relate to the value of the impact of levee construction only upon the specified region, either the identified county or the whole State.

TABLE III-1

## AGGREGATED GROUPING OF INDUSTRIES

AGRICULTURE (A)	PETROLEUM & ASPHALT (A)
FOREST & GREENHOUSE (A)	STONE & CLAY PRODUCTS (A)
AGRICULTURAL, FORESTRY	CONCRETE BLOCK & BRICK
LANDSCAPE AND HORTICULTURE	HEATING & PLUMBING (A)
ORE & CHEMICAL MINERALS (A)	FABRICATED METAL PRODUCTS (A)
PETROLEUM MINING (A)	OTHER FABRICATED METALS (A)
CLAY & STONE MINING (A)	SHEET METAL WORK
CRUSHED & BROKEN LIMES	MOTOR VEHICLES & EQUIPMENT (A)
NEW RESIDENTIAL STRUCTURE	FARM & GARDEN MACHINERY (A)
NEW INDUSTRIAL & COMMERCIAL	CONSTRUCTION MACHINE (A)
NEW UTILITY STRUCTURES	MATERIALS HANDLING EQUIPMENT (A)
NEW HIGHWAYS & STREETS	SPECIAL INDUSTRY MACHINE
EXCAVATION AND OTHER (A)	GENERAL INDUSTRIAL EQUIPMENT (A)
MAINTENANCE & REPAIR (A)	MACHINERY, EXCEPT ELECTRICAL
DURABLE GOODS (A)	OFFICE MACHINES (A)
FOOD & KINDRED PROGRAMS (A)	SERVICE INDUSTRY MACHINES (A)
NONDURABLE GOODS (A)	ELECTRICAL INDUSTRIAL (A)
PRINTING & PUBLISHING (A)	ELECTRICAL LIGHTING (A)
COMMUNICATIONS & EQUIPMENT (A)	ELECTRICAL N.E.C. (A)
OTHER TRANSPORTATION (A)	SCIENTIFIC & OPTIC (A)
MISC. MANUFACTURING	TRANSPORT, AND WAREHOUSE (A)
UTILITIES (A)	WHOLESALE & RETAIL (A)
BANKING & FINANCE (A)	INSURANCE (A)
OWNER OCCUPIED DWELLINGS	REAL ESTATE
HOTELS AND EATING PLACES (A)	PERSONAL SERVICES (A)
BUSINESS SERVICES (A)	ENGINEERING, ARCHITECTURE
ENTERTAINMENT (A)	HEALTH, EDUCATION & SOCIAL (A)
FEDERAL GOVERN. ENTERPRISES (A)	STATE GOVERNMENT ENTERPRISE (A)
GOVERNMENT INDUSTRY	REST OF THE WORLD INDUSTRY
HOUSEHOLD INDUSTRY	INVENTORY VALUATION ADJUSTMENT

(A) = Aggregate Sector - See Attachment "A" for aggregate scheme.

### 3.5 Final Demand Changes

Estimation of impacts are generated by first changing the dollar value of the final demand for the product of a target industry in a defined region. Generally, there is no one industry category that adequately describes the construction of flood protection projects. Thus, it was not possible to estimate the impact from the value of the change in final demand for a single industry as is customary. What was required was to define the individual products and activities required for the construction projects and then assign the purchase costs for these to related IMPLAN Sectors. When taken together, the costs associated with all the sectors represent the aggregate change in final demand. This approach defines the purchasing pattern specific to both the region and the project being studied. This development of a project specific purchase pattern helps to overcome the limitation inherent in the Micro IMPLAN model of assuming nationally averaged purchasing patterns.

To estimate the impacts for the Moorefield, West Virginia project, it is necessary to select a set of industries which represents the various activities or manufactured products associated with constructing earthen levees. The selection of industries was based upon information contained in the engineer's construction design which delineated a set of activities (feature accounts) required for the project. These items, were either activities or manufactured products, which were matched with specific industry SIC classification and then related to specific IMPLAN sectors, Table III-2. Values for different items that are matched with the same industry SIC classification were added together in the same IMPLAN sector and used with Micro IMPLAN as the required input of final demand changes to generate impact estimates.

With Micro IMPLAN, it is possible to estimate the impact to the regional economy resulting from changes in earned wages. This is done by developing a separate input set of final demand changes based upon personal consumption expenditure based upon personal consumption expenditure coefficients. These coefficients are produced by Micro IMPLAN when the study region is created. This input set is impacted by the dollar value of construction and O&M costs to generate estimates of regional economic impacts from consumer spending.

#### 4.0 IMPACT RESULTS

A regional economic impact assessment has been done to estimate the impacts of the construction of a proposed flood protection project for the town of Moorefield, West Virginia. This project would provide the town with a "100 year level" of flood protection. Separate assessments were made to estimate the annual impacts to the whole state of West Virginia and to Hardy County of the purchase of materials and supplies and labor during the construction phase and the expenditures for the operation and maintenance of the levees.

Total cost for the flood protection project are presented in Table IV-1. All costs are inclusive of contingency figures. Cost for engineering & design and management are expenses incurred by the corps outside of the study area. These costs were thus not included in the total construction cost used to estimate impacts.

It was assumed that the total cost estimates of construction activities items include both the expense for the purchase of materials and the wages paid to labor. These costs were separated for appropriate industries except those related to real estate based upon a 45:55 ratio of material to labor wages. The COE had defined the construction period for 3 years from 1993 - 1995; thus, the total construction costs for each final demand industry was divided by 3 to estimate annual change. These annual values are presented in Table IV-2.

Total construction cost are projected to be \$12.048 million. Excluding the costs for engineering and design and construction management, total construction cost used for estimating impacts was \$9.123 million, which is an annual cost of \$3.041 million, Table IV-2.

Because the IMPLAN system uses census data for 1982, all dollar values were first deflated to 1982 values and then inflated back to their

TABLE III-2  
MOOREFIELD, WEST VIRGINIA  
(HARDY COUNTY)  
LOCAL FLOOD PROTECTION PROJECT  
CONSTRUCTION ACTIVITIES AND RELATED SIC AND IMPLAN CATEGORIES

<u>Feature Number</u>	<u>Description</u>	<u>SIC Major Group ('87 Edition)</u>	<u>Implan Categories</u>
.01	Lands & Damages	65	470 Real Estate
.02	Relocations		
	Bridge	16	69 Highways and Streets
	Trailer Park	65	470 Real Estate
	Pumping Plants	16	68 Utility Struct.
	Bridge & Utilities	16	69 Highways and Streets
.06	Fish & Wildlife Facilities	65	470 Real Estate
.11	Levees & Floodwalls	16	690 Highways and Streets
	14	45 Mining	
	07	27 Landscaping	

Source: Feature categories from COE, Baltimore District  
Summary of Cost (Dated 10/16/89)

TABLE IV - 1

SUMMARY OF PROJECT COST  
 MOOREFIELD, WEST VIRGINIA  
 (HARDY COUNTY)

LOCAL FLOOD PROTECTION PROJECT

Interest Rate = 0.08875  
 October 1988 Price Levels  
 (\$1,000)

<u>Feature Account</u>	(1) % <u>Cont.</u>	<u>Plan 4 - N&amp;S Moorefield Levee 100-YR</u>
.01 Lands & Damage	25	\$ 715.
.02 Relocations		
Sewer Bridge/Trailer Pk.	15	1,863.
South Moorefield	30	0
Other Relocations	15	1,110.
.06 FWL Fac. (Mitigation)	25	88.
.11 Levees & Floodwalls	20	5,367.
.18 Cultural Resource Mitigation	15	<u>90.</u>
Subtotal		9,232.
.19 Engineering & Design		2,216.
.20 Constr. Management		<u>600.</u>
Total Project Construction Cost		12,048.
Interest During Construction		<u>2,057.</u>
TOTAL INVESTMENT COST		\$14,106
AVERAGE ANNUAL COSTS		
Annualized Investment		1,252.
Operation & Maintenance		66.
Induced Damages		<u>0</u>
TOTAL ANNUAL COST		\$1,318.

(1) Percent Contingency

Source: COE, Baltimore District - Summary of Project Costs (Dated 10/16/89).

Table IV-2

STATE-WIDE IMPACTS

MOOREFIELD, WVA. FINAL DEMAND CHANGES / PLAN 4 - 100 YR. PROTECTION

MATERIALS:

IMPLAN NO. / TITLE	TOTAL CONST. COST	45% TOTAL (1) CONST. COST	1 YR COST	CCI(3) DEFLATOR	IMPLAN(4) DEFLATOR	82 \$ DOLLARS	% OF 82 DOLLARS
27 LANDSCAPING	1,336,835	601,576	200,525	191,067	0.987	193,584	0.145383476
45 MINNING	534,734	240,630	80,210	76,427	1.096	69,733	0.052369887
68 UTILITY STRUCTURES	124,718	56,123	18,708	17,825	1.110	16,059	0.012060367
69 HIGHWAYS & STREETS	5,806,234	2,612,805	870,935	829,857	1.155	718,491	0.539593791
470 REAL ESTATE (2)	1,320,570	(2)	440,190	419,428	1.257	333,674	0.250592477
<b>TOTALS</b>	<b>\$9,123,091</b>	<b>\$3,511,134</b>	<b>\$1,610,568</b>	<b>\$1,534,605</b>		<b>\$1,331,541</b>	<b>1.000</b>

LABOR:

IMPLAN NO. / TITLE	TOTAL CONST. COST	55% TOTAL (1) CONST. COST	1 YR COST	CCI(3) DEFLATOR	IMPLAN(4) DEFLATOR	82 \$ DOLLARS	% OF 82 DOLLARS
27 LANDSCAPING	1,336,835	735,259	245,086	233,527	0.987	236,603	0.152323688
45 MINNING	534,734	294,104	98,035	93,411	1.096	85,229	0.054869883
68 UTILITY STRUCTURES	124,718	68,595	22,865	21,787	1.110	19,628	0.012636097
69 HIGHWAYS & STREETS	5,806,234	3,193,429	1,064,476	1,014,270	1.155	878,156	0.565352535
470 REAL ESTATE (2)	1,320,570	(2)	440,190	419,428	1.257	333,674	0.214817794
<b>TOTALS</b>	<b>\$9,123,091</b>	<b>\$4,291,387</b>	<b>\$1,870,652</b>	<b>\$1,782,422</b>		<b>\$1,553,289</b>	<b>1.000</b>

NOTES:

- 1) Cost were adjusted to separate labor and materials purchases by a 55:45 ratio.
- 2) Real estate cost were taken at full value and not subjected to labor/materials ratio.
- 3) Construction costs were deflated from Oct. '88 dollars to Nov. '86 dollars using Construction Cost Index (CCI) for Oct. '88 and Nov. '86 (4555/4340 = 1.0495).
- 4) Nov. '86 dollars were deflated to '82 dollars to be compatible with IMPLAN data base.  
Dollars deflated with IMPLAN deflators specific for each industry sector.

Table IV-2 (cont.)

STATE-WIDE IMPACTS

MOOREFIELD, WVA. FINAL DEMAND CHANGES / PLAN 4 - 100 YR. PROTECTION

TOTAL COSTS:

IMPLAN NO. / TITLE	TOTAL CONST. COST	TOTAL CONST. COST	1 YR COST	CCI(2) DEFLATOR	IMPLAN(3) DEFLATOR	82 DOLLARS	% OF 82 DOLLARS
27 LANDSCAPING	1,336,835	1,336,835	445,612	424,594	0.987	430,187	0.168624260
45 MINNING	534,734	534,734	178,245	169,838	1.096	154,961	0.060741658
68 UTILITY STRUCTURES	124,718	124,718	41,573	39,612	1.110	35,686	0.013988320
69 HIGHWAYS & STREETS	5,806,234	5,806,234	1,935,411	1,844,127	1.155	1,596,647	0.625852444
470 REAL ESTATE (1)	1,320,570	1,320,570	440,190	419,428	1.257	333,674	0.130793316
TOTALS	\$9,123,091	\$9,123,091	\$3,041,030	\$2,897,599		\$2,551,155	1.000

NOTES:

- 1) Real estate cost were taken at full value and not subjected to labor/materials ratio.
- 2) Construction costs were deflated from Oct. '88 dollars to Nov. '86 dollars using Construction Cost Index (CCI) for Oct. '88 and Nov. '86 (4555/4340 = 1.0495).
- 3) Nov. '86 dollars were deflated to '82 dollars to be compatable with IMPLAN data base.  
Dollars deflated with IMPLAN deflators specific for each industry sector.



original year after the impact calculations were completed. Construction costs for the Moorefield flood protection project were presented in October, 1988 prices which were deflated to 1986 prices using a conversion factor derived from the Construction Cost Index. All 1986 values were deflated using separate industry deflators published by the Bureau of Labor Statistics (BLS). The reverse of this process was used to bring prices back to October 1988 levels.

#### 4.1 Short Term Impacts To Whole State

Short term impacts to the whole state of West Virginia were estimated for each year of the proposed construction period 1993-1995. Estimated impacts are presented in Tables IV-3 to IV-8 and were derived from the changes in final demand for products of the industries presented in Table IV-2. Impacts were estimated for the purchase of materials and labor combined as well as for each separately.

##### 4.1.1 Total Input Expenditures

As shown in Table IV-2, the one year total construction cost would be \$3.041 million (in 1988 dollars). This represents an adjusted cost of \$2.551 million in 1982 dollars. When considering the combined impacts from the purchase of both materials and labor, this annual value yielded the following results:

(Million 1988 Dollars)

	Tot.Gross Output (TGO)	Employee Income (EI)	Property Income (PI)	Total Income (TI)	Value Added (VA)	Business Taxes (BT)
Direct Impact	3.1957	0.8989	0.5232	1.4221	1.5368	0.1147
Indirect Impact	0.7988	0.2284	0.1232	0.3517	0.3767	0.0250
Induced Impact	0.7313	0.2384	0.1866	0.4250	0.4812	0.0562
Total Impact	4.8334	1.3656	0.8330	2.1987	1.3947	0.1960

These results show that for \$3.041 million of activity related to the purchase of materials and wages to labor for the construction of the proposed flood protection project, \$4.8334 worth of total regional industry output would result. This represents an additional \$1.6377 million over the amount spent directly for the construction project. This additional economic activity represents the value of goods and services to manufacture products that provide the construction supplies as well as the impacts of increased consumer spending from \$1.3656 million of additional wages and salaries. Business and property owners received \$0.833 million in profits, rents, interest etc. and provided government with \$0.196 million in new indirect business taxes.

Tables IV-3 to IV-6 show the estimated direct, indirect, induced and total impacts to each industry sector resulting from this economic activity within the state of West Virginia.

It should be noted that the total for changes in direct impacts (Table IV-3) is greater than the total construction cost, which represent the changes in final demand for the project. This difference results from estimating impacts by combining the expenditures for materials and from labor. The impact estimates for materials purchase and wage effects are presented separately below.

Table IV - 3

INPUT EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
DIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0018	.0018	.0001	.0003	.0004	.0004	.02
22 AGG FOREST AND GREENHOUS	.0003	.0003	.0001	.0001	.0002	.0002	.01
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.3709	.3709	.1752	.0884	.2635	.2724	15.16
35 AGG ORE AND CHEMICAL MIN	.0003	.0003	.0001	.0000	.0001	.0001	.00
41 AGG PETROLEUM MINING	.0002	.0002	.0000	.0001	.0001	.0001	.00
44 AGG CLAY AND STONE MININ	.0000	.0000	.0000	.0000	.0000	.0000	.00
45 CRUSHED AND BROKEN LIMES	.1336	.1336	.0415	.0306	.0721	.0777	1.49
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0308	.0308	.0109	.0011	.0119	.0123	.58
69 NEW HIGHWAYS AND STREETS	1.3765	1.3765	.3753	.0511	.4264	.4452	14.79
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0000	.0000	.0000	.0000	.0000	.00
79 AGG DURABLE GOODS	.0003	.0003	.0001	.0000	.0001	.0001	.00
82 AGG FOOD AND KINDRED PRO	.0130	.0130	.0025	.0012	.0037	.0038	.12
131 AGG NONDURABLE GOODS	.0072	.0072	.0017	.0007	.0023	.0024	.08
200 AGG PRINTING AND PUBLISH	.0010	.0010	.0004	.0001	.0005	.0005	.02
235 AGG PETROLEUM AND ASPHAL	.0033	.0033	.0001	.0001	.0002	.0003	.00
257 AGG STONE AND CLAY PRODU	.0001	.0001	.0000	.0000	.0000	.0000	.00
267 CONCRETE BLOCK AND BRICK	.0000	.0000	.0000	.0000	.0000	.0000	.00
306 AGG HEATING AND PLUMBING	.0000	.0000	.0000	.0000	.0000	.0000	.00
308 AGG FABRICATED METAL PRO	.0000	.0000	.0000	.0000	.0000	.0000	.00
309 AGG OTHER FABRICATED MET	.0002	.0002	.0001	.0000	.0001	.0001	.00
311 SHEET METAL WORK	.0000	.0000	.0000	.0000	.0000	.0000	.00
331 AGG MOTOR VEHICLES AND E	.0003	.0003	.0001	.0000	.0001	.0001	.00
332 AGG FARM AND GARDEN MACH	.0000	.0000	.0000	.0000	.0000	.0000	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
338 AGG MATERIALS HANDLING E	.0000	.0000	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0000	.0000	.0000	.0000	.0000	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0000	.0000	.0000	.0000	.0000	.00
386 AGG ELECTRICAL LIGHTING	.0000	.0000	.0000	.0000	.0000	.0000	.00
389 AGG COMMUNICATIONS AND E	.0050	.0050	.0020	.0017	.0036	.0040	.07
393 AGG ELECTRICAL N.E.C.	.0001	.0001	.0000	.0000	.0000	.0000	.00
406 AGG OTHER TRANSPORTATION	.0001	.0001	.0000	-.0000	.0000	.0000	.00
416 AGG SCIENTIFIC AND OPTIC	.0004	.0004	.0002	.0001	.0002	.0002	.01
426 AGG MISC. MANUFACTURING	.0001	.0001	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0066	.0066	.0025	.0008	.0032	.0034	.09
456 AGG UTILITIES	.0156	.0156	.0017	.0037	.0054	.0060	.06
460 AGG WHOLESALE AND RETAIL	.0353	.0353	.0163	.0040	.0202	.0254	1.83
464 AGG BANKING AND FINANCE	.0114	.0114	.0048	.0018	.0066	.0068	.25
467 AGG INSURANCE	.0043	.0043	.0016	.0002	.0018	.0020	.08
469 OWNER-OCCUPIED DWELLINGS	.0409	.0409	.0000	.0260	.0260	.0337	.00
470 REAL ESTATE	.6436	.6436	.0324	.3944	.4269	.5116	4.69
471 AGG HOTELS AND EATING PL	.0179	.0179	.0052	.0015	.0066	.0073	.61
472 AGG PERSONAL SERVICES	.0105	.0105	.0032	.0022	.0054	.0057	.23
478 AGG BUSINESS SERVICES	.0045	.0045	.0016	.0016	.0032	.0032	.09
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0038	.0038	.0010	.0007	.0017	.0023	.10
503 AGG HEALTH, EDUCA. & SOC	.0411	.0411	.0192	.0034	.0226	.0227	1.28
516 AGG FEDERAL GOVERN. ENTE	.0014	.0014	.0011	-.0001	.0010	.0010	.04
519 AGG STATE GOV. ENTERPRISE	.0024	.0024	.0006	.0003	.0009	.0009	.04
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0013	.0013	.0013	.0000	.0013	.0013	.16
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	2.7859	2.7859	.7026	.6160	1.3187	1.4536	41.92
CHANGE IN POPULATION -	132.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV - 4

INPUT EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
INDIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0000	.0026	.0002	.0004	.0006	.0006	.04
22 AGG FOREST AND GREENHOUSE	.0000	.0027	.0004	.0010	.0015	.0016	.08
26 AGRICULTURAL, FORESTRY, LANDSCAPE AND HORTICULTU	.0000	.0001	.0000	.0000	.0000	.0000	.01
27 AGG ORE AND CHEMICAL MIN	.0000	.0034	.0026	.0013	.0039	.0040	.22
35 AGG PETROLEUM MINING	.0000	.0045	.0014	.0006	.0021	.0023	.04
41 AGG CLAY AND STONE MININ	.0000	.0132	.0009	.0058	.0067	.0082	.01
44 AGG CRUSHED AND BROKEN LIMES	.0000	.0084	.0039	.0024	.0063	.0070	.14
45 NEW RESIDENTIAL STRUCTUR	.0000	.0084	.0026	.0019	.0045	.0049	.09
66 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0354	.0150	.0018	.0168	.0172	.55
79 AGG DURABLE GOODS	.0000	.0162	.0044	.0006	.0049	.0052	.15
82 AGG FOOD AND KINDRED PRO	.0000	.0025	.0005	.0002	.0007	.0007	.02
131 AGG NONDURABLE GOODS	.0000	.0236	.0054	.0022	.0076	.0080	.25
200 AGG PRINTING AND PUBLISH	.0000	.0053	.0018	.0006	.0024	.0024	.13
235 AGG PETROLEUM AND ASPHAL	.0000	.0999	.0041	.0035	.0076	.0101	.10
257 AGG STONE AND CLAY PRODU	.0000	.0464	.0135	.0029	.0164	.0172	1.39
267 CONCRETE BLOCK AND BRICK	.0000	.0004	.0001	.0000	.0001	.0002	.00
306 AGG HEATING AND PLUMBING	.0000	.0009	.0002	.0001	.0003	.0003	.01
308 AGG FABRICATED METAL PRO	.0000	.0116	.0032	.0009	.0040	.0042	.19
309 AGG OTHER FABRICATED MET	.0000	.0034	.0010	.0004	.0014	.0014	.05
311 SHEET METAL WORK	.0000	.0033	.0009	.0003	.0012	.0012	.02
331 AGG MOTOR VEHICLES AND E	.0000	.0003	.0001	.0000	.0001	.0001	.00
332 AGG FARM AND GARDEN MACH	.0000	.0005	.0001	.0000	.0002	.0002	.01
334 AGG CONSTRUCTION MACHINE	.0000	.0015	.0004	.0001	.0005	.0005	.03
338 AGG MATERIALS HANDLING E	.0000	.0001	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0003	.0001	.0000	.0001	.0001	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0006	.0002	.0000	.0002	.0002	.01
386 AGG ELECTRICAL LIGHTING	.0000	.0005	.0001	.0001	.0002	.0002	.01
389 AGG COMMUNICATIONS AND E	.0000	.0105	.0042	.0035	.0076	.0084	.15
393 AGG ELECTRICAL N.E.C.	.0000	.0005	.0002	.0000	.0002	.0002	.01
406 AGG OTHER TRANSPORTATION	.0000	.0004	.0001	.0001	.0001	.0001	.01
416 AGG SCIENTIFIC AND OPTIC	.0000	.0009	.0003	.0001	.0005	.0005	.01
426 AGG MISC. MANUFACTURING	.0000	.0006	.0002	.0001	.0002	.0002	.01
446 AGG TRANSPORT. AND WAREH	.0000	.0762	.0285	.0092	.0377	.0398	1.08
456 AGG UTILITIES	.0000	.0282	.0030	.0067	.0097	.0109	.11
460 AGG WHOLESALE AND RETAIL	.0000	.0089	.0041	.0010	.0051	.0064	.46
464 AGG BANKING AND FINANCE	.0000	.0150	.0063	.0024	.0087	.0090	.33
467 AGG INSURANCE	.0000	.0094	.0035	.0005	.0040	.0044	.17
469 OWNER-OCCUPIED DWELLINGS	.0000	.0000	.0000	.0000	.0000	.0000	.00
470 REAL ESTATE	.0000	.0448	.0023	.0275	.0297	.0356	.33
471 AGG HOTELS AND EATING PL	.0000	.0105	.0030	.0009	.0039	.0043	.36
472 AGG PERSONAL SERVICES	.0000	.0147	.0045	.0031	.0076	.0079	.32
478 AGG BUSINESS SERVICES	.0000	.0357	.0127	.0128	.0255	.0258	.71
489 ENGINEERING, ARCHITECTUR	.0000	.0850	.0433	.0135	.0568	.0579	1.95
495 AGG ENTERTAINMENT	.0000	.0006	.0002	.0001	.0003	.0004	.02
503 AGG HEALTH, EDUCA. & SOC	.0000	.0021	.0010	.0002	.0012	.0012	.07
516 AGG FEDERAL GOVERN. ENTE	.0000	.0045	.0036	.0003	.0032	.0032	.12
519 AGG STATE GOV. ENTERPRISE	.0000	.0035	.0009	.0004	.0013	.0013	.06
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0000	.6541	.1849	.1087	.2936	.3157	9.82
CHANGE IN POPULATION -	31.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV - 5

 INPUT EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
 INDUCED CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TGO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0044	.0100	.0007	.0016	.0022	.0024	.13
22 AGG FOREST AND GREENHOUS	.0007	.0008	.0001	.0003	.0004	.0005	.02
26 AGRICULTURAL, FORESTRY,	.0001	.0002	.0001	.0000	.0001	.0001	.01
27 LANDSCAPE AND HORTICULTU	.0000	.0006	.0003	.0001	.0004	.0004	.02
35 AGG ORE AND CHEMICAL MIN	.0006	.0034	.0011	.0005	.0016	.0017	.03
41 AGG PETROLEUM MINING	.0004	.0046	.0003	.0020	.0023	.0029	.00
44 AGG CLAY AND STONE MININ	.0000	.0001	.0000	.0000	.0000	.0000	.00
45 CRUSHED AND BROKEN LIMES	.0000	.0001	.0000	.0000	.0001	.0001	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0126	.0053	.0006	.0060	.0061	.20
79 AGG DURABLE GOODS	.0006	.0023	.0006	.0001	.0007	.0007	.02
82 AGG FOOD AND KINDRED PRO	.0311	.0357	.0068	.0034	.0102	.0104	.32
131 AGG NONDURABLE GOODS	.0172	.0283	.0065	.0027	.0091	.0095	.30
200 AGG PRINTING AND PUBLISH	.0025	.0054	.0019	.0006	.0024	.0025	.13
235 AGG PETROLEUM AND ASPHAL	.0078	.0102	.0004	.0004	.0008	.0010	.01
257 AGG STONE AND CLAY PRODU	.0002	.0004	.0001	.0000	.0001	.0001	.01
267 CONCRETE BLOCK AND BRICK	.0000	.0000	.0000	.0000	.0000	.0000	.00
306 AGG HEATING AND PLUMBING	.0000	.0002	.0000	.0000	.0001	.0001	.00
308 AGG FABRICATED METAL PRO	.0000	.0000	.0000	.0000	.0000	.0000	.00
309 AGG OTHER FABRICATED MET	.0003	.0006	.0002	.0001	.0002	.0002	.01
311 SHEET METAL WORK	.0000	.0000	.0000	.0000	.0000	.0000	.00
331 AGG MOTOR VEHICLES AND E	.0005	.0006	.0002	.0000	.0002	.0002	.01
332 AGG FARM AND GARDEN MACH	.0000	.0001	.0000	.0000	.0000	.0000	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0001	.0000	.0000	.0000	.0000	.00
338 AGG MATERIALS HANDLING E	.0000	.0000	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0001	.0000	.0000	.0000	.0000	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0001	.0000	.0000	.0000	.0000	.00
386 AGG ELECTRICAL LIGHTING	.0001	.0001	.0000	.0000	.0000	.0000	.00
389 AGG COMMUNICATIONS AND E	.0119	.0166	.0066	.0055	.0121	.0133	.23
393 AGG ELECTRICAL N.E.C.	.0003	.0004	.0001	.0000	.0001	.0001	.01
406 AGG OTHER TRANSPORTATION	.0001	.0002	.0001	-.0000	.0000	.0000	.00
416 AGG SCIENTIFIC AND OPTIC	.0010	.0017	.0006	.0003	.0009	.0009	.02
426 AGG MISC. MANUFACTURING	.0003	.0004	.0001	.0001	.0002	.0002	.01
446 AGG TRANSPORT. AND WAREH	.0157	.0246	.0092	.0030	.0121	.0128	.35
456 AGG UTILITIES	.0374	.0500	.0054	.0119	.0173	.0193	.20
460 AGG WHOLESALE AND RETAIL	.0843	.0857	.0395	.0096	.0491	.0617	4.44
464 AGG BANKING AND FINANCE	.0272	.0318	.0134	.0051	.0185	.0191	.70
467 AGG INSURANCE	.0104	.0143	.0053	.0008	.0060	.0066	.26
469 OWNER-OCCUPIED DWELLINGS	.0977	.0977	.0000	.0620	.0620	.0804	.00
470 REAL ESTATE	.0103	.0229	.0012	.0140	.0152	.0182	.17
471 AGG HOTELS AND EATING PL	.0426	.0463	.0134	.0038	.0172	.0191	1.59
472 AGG PERSONAL SERVICES	.0252	.0282	.0086	.0059	.0145	.0152	.61
478 AGG BUSINESS SERVICES	.0108	.0200	.0071	.0072	.0143	.0145	.40
489 ENGINEERING, ARCHITECTUR	.0000	.0001	.0001	.0000	.0001	.0001	.00
495 AGG ENTERTAINMENT	.0091	.0100	.0026	.0019	.0045	.0061	.27
503 AGG HEALTH, EDUCA. & SOC	.0981	.1011	.0473	.0083	.0556	.0558	3.15
516 AGG FEDERAL GOVERN. ENTE	.0033	.0053	.0042	-.0004	.0038	.0038	.14
519 AGG STATE GOV. ENTERPRISE	.0057	.0065	.0017	.0008	.0025	.0025	.12
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0031	.0031	.0031	.0000	.0031	.0031	.38
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.5611	.6837	.1943	.1521	.3464	.3922	14.28
CHANGE IN POPULATION -	45.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV - 6

 INPUT EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
 TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0062	.0144	.0010	.0023	.0032	.0035	.19
22 AGG FOREST AND GREENHOUS	.0011	.0039	.0006	.0015	.0021	.0022	.11
26 AGRICULTURAL, FORESTRY,	.0001	.0003	.0001	.0000	.0001	.0001	.02
27 LANDSCAPE AND HORTICULTU	.3709	.3769	.1780	.0898	.2678	.2768	15.41
35 AGG ORE AND CHEMICAL MIN	.0008	.0082	.0026	.0012	.0037	.0041	.07
41 AGG PETROLEUM MINING	.0006	.0179	.0013	.0079	.0091	.0112	.02
44 AGG CLAY AND STONE MININ	.0000	.0126	.0040	.0024	.0064	.0070	.14
45 CRUSHED AND BROKEN LIMES	.1336	.1420	.0441	.0325	.0767	.0826	1.58
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0308	.0308	.0109	.0011	.0119	.0123	.58
69 NEW HIGHWAYS AND STREETS	1.3765	1.3765	.3753	.0511	.4264	.4452	14.79
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0479	.0203	.0024	.0227	.0233	.75
79 AGG DURABLE GOODS	.0008	.0187	.0050	.0006	.0057	.0060	.17
82 AGG FOOD AND KINDRED PRO	.0441	.0513	.0098	.0048	.0146	.0149	.46
131 AGG NONDURABLE GOODS	.0245	.0592	.0135	.0056	.0191	.0199	.63
200 AGG PRINTING AND PUBLISH	.0035	.0117	.0040	.0013	.0053	.0054	.28
235 AGG PETROLEUM AND ASPHAL	.0111	.1134	.0046	.0039	.0086	.0115	.12
257 AGG STONE AND CLAY PRODU	.0002	.0469	.0136	.0029	.0165	.0174	1.41
267 CONCRETE BLOCK AND BRICK	.0000	.0004	.0001	.0000	.0001	.0002	.00
306 AGG HEATING AND PLUMBING	.0000	.0010	.0003	.0002	.0004	.0004	.02
308 AGG FABRICATED METAL PRO	.0000	.0117	.0032	.0009	.0040	.0042	.19
309 AGG OTHER FABRICATED MET	.0005	.0041	.0012	.0005	.0017	.0018	.06
311 SHEET METAL WORK	.0000	.0033	.0010	.0003	.0012	.0012	.02
331 AGG MOTOR VEHICLES AND E	.0008	.0012	.0003	.0000	.0003	.0004	.02
332 AGG FARM AND GARDEN MACH	.0000	.0006	.0001	.0001	.0002	.0002	.01
334 AGG CONSTRUCTION MACHINE	.0000	.0016	.0004	.0002	.0006	.0006	.03
338 AGG MATERIALS HANDLING E	.0000	.0001	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0001	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0001	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0004	.0001	.0000	.0001	.0001	.01
371 AGG ELECTRICAL INDUSTRIA	.0000	.0007	.0002	.0001	.0003	.0003	.01
386 AGG ELECTRICAL LIGHTING	.0001	.0007	.0001	.0001	.0002	.0002	.01
389 AGG COMMUNICATIONS AND E	.0169	.0321	.0128	.0106	.0234	.0257	.45
393 AGG ELECTRICAL N.E.C.	.0004	.0010	.0003	.0000	.0003	.0004	.02
406 AGG OTHER TRANSPORTATION	.0002	.0007	.0003	-.0001	.0001	.0001	.01
416 AGG SCIENTIFIC AND OPTIC	.0014	.0030	.0011	.0005	.0016	.0016	.04
426 AGG MISC. MANUFACTURING	.0004	.0011	.0003	.0001	.0004	.0005	.02
446 AGG TRANSPORT. AND WAREH	.0223	.1074	.0401	.0129	.0530	.0561	1.52
456 AGG UTILITIES	.0530	.0938	.0101	.0223	.0324	.0362	.38
460 AGG WHOLESALE AND RETAIL	.1196	.1299	.0599	.0146	.0745	.0936	6.73
464 AGG BANKING AND FINANCE	.0386	.0581	.0245	.0092	.0337	.0350	1.27
467 AGG INSURANCE	.0147	.0280	.0103	.0015	.0118	.0129	.50
469 OWNER-OCCUPIED DWELLINGS	.1386	.1386	.0000	.0880	.0880	.1141	.00
470 REAL ESTATE	.6539	.7113	.0359	.4360	.4718	.5655	5.18
471 AGG HOTELS AND EATING PL	.0604	.0747	.0216	.0061	.0278	.0307	2.56
472 AGG PERSONAL SERVICES	.0358	.0534	.0163	.0112	.0275	.0289	1.16
478 AGG BUSINESS SERVICES	.0153	.0601	.0214	.0216	.0430	.0435	1.19
489 ENGINEERING, ARCHITECTUR	.0000	.0851	.0434	.0135	.0569	.0580	1.95
495 AGG ENTERTAINMENT	.0129	.0144	.0038	.0027	.0064	.0088	.39
503 AGG HEALTH, EDUCA. & SOC	.1392	.1444	.0675	.0118	.0794	.0796	4.49
516 AGG FEDERAL GOVERN. ENTE	.0046	.0111	.0089	-.0008	.0081	.0081	.30
519 AGG STATE GOV. ENTERPRISE	.0081	.0125	.0032	.0015	.0047	.0047	.22
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0044	.0044	.0044	.0000	.0044	.0044	.54
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	3.3470	4.1237	1.0818	.8769	1.9586	2.1615	66.01
CHANGE IN POPULATION -	208.						

Source: Micro IMPLAN, U.S. Forest Service

#### 4.1.2 Materials Expenditure

Estimates of impacts to West Virginia industries were assessed for expenditures related only to the purchases of materials related to the construction activities. Estimated total impacts are shown in to each industry. Table IV-7. For this assessment, expenditures for household goods and services from construction employees were not considered. The impact from, only purchasing construction materials generated the following estimated total impacts:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	4.4145	1.2466	0.7399	1.9864	2.1545	0.1681

Thus, the purchase of construction material related to total construction costs of \$3.041 million, generated \$4.4145 million of industry output throughout the state of West Virginia. This represents an additional \$1.3735 million of production in all industries within the state. Additionally, \$1.2466 million of wages and salaries were produced and businesses indirectly paid the government taxes equalling \$0.1681 million.

Comparing the additional value of total gross output (\$1.3735 million) to the estimated additional gross output from all input expenditures of \$1.7924 million, shows that the purchase of materials alone constituted 91.3% of the total additional change in gross output. Although the purchase of materials was only 45% of the total dollars spent for construction, it contributes 91% of the estimated total additional change in total gross output.

Estimating the impact of the purchase of construction materials using the full value of annual construction costs, derives an assessment of the direct purchase of the final demand sectors to themselves as well as to all other industries in the regional economy. Alternatively, if just that portion of total costs associated with materials purchase were used, the derived estimates would reflect the direct purchases from all other industries within the state but not the direct purchases of materials from industries with targeted changes in final demand. A comparison of the results from these two assessments would thus provide an understanding of how the direct purchases of construction materials is partitioned into those industries selected to represent levee construction activities, and all other industries.

Using a value of \$1,611 million (1988 dollars) as the materials portion of total annual construction cost (Table IV-2), the following estimated value of direct purchases was obtained.

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Direct Impact	1.5279	0.4289	0.2414	0.6703	0.7199	0.0496

Table IV - 7

MATERIALS EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0022	.0051	.0003	.0008	.0011	.0012	.07
22 AGG FOREST AND GREENHOUS	.0004	.0020	.0003	.0008	.0011	.0012	.06
26 AGRICULTURAL, FORESTRY,	.0000	.0001	.0000	.0000	.0000	.0001	.01
27 LANDSCAPE AND HORTICULTU	.2246	.2277	.1076	.0543	.1618	.1673	9.31
35 AGG ORE AND CHEMICAL MIN	.0003	.0036	.0011	.0005	.0016	.0018	.03
41 AGG PETROLEUM MINING	.0002	.0090	.0006	.0040	.0046	.0056	.01
44 AGG CLAY AND STONE MININ	.0000	.0076	.0024	.0014	.0038	.0042	.08
45 CRUSHED AND BROKEN LIMES	.0809	.0860	.0267	.0197	.0464	.0500	.96
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0186	.0186	.0066	.0006	.0072	.0074	.35
69 NEW HIGHWAYS AND STREETS	.8336	.8336	.2273	.0310	.2583	.2696	8.96
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0191	.0081	.0010	.0091	.0093	.30
79 AGG DURABLE GOODS	.0003	.0104	.0028	.0004	.0031	.0033	.09
82 AGG FOOD AND KINDRED PRO	.0155	.0181	.0034	.0017	.0051	.0053	.16
131 AGG NONDURABLE GOODS	.0086	.0254	.0058	.0024	.0082	.0085	.27
200 AGG PRINTING AND PUBLISH	.0012	.0043	.0015	.0005	.0019	.0020	.10
235 AGG PETROLEUM AND ASPHAL	.0039	.0648	.0027	.0022	.0049	.0065	.07
257 AGG STONE AND CLAY PRODU	.0001	.0281	.0082	.0018	.0099	.0104	.84
267 CONCRETE BLOCK AND BRICK	.0000	.0002	.0001	.0000	.0001	.0001	.00
306 AGG HEATING AND PLUMBING	.0000	.0005	.0001	.0001	.0002	.0002	.01
308 AGG FABRICATED METAL PRO	.0000	.0070	.0019	.0005	.0024	.0026	.12
309 AGG OTHER FABRICATED MET	.0002	.0022	.0007	.0003	.0009	.0010	.03
311 SHEET METAL WORK	.0000	.0020	.0006	.0002	.0007	.0007	.01
331 AGG MOTOR VEHICLES AND E	.0003	.0005	.0001	.0000	.0001	.0002	.01
332 AGG FARM AND GARDEN MACH	.0000	.0003	.0001	.0000	.0001	.0001	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0009	.0002	.0001	.0003	.0003	.02
338 AGG MATERIALS HANDLING E	.0000	.0001	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0002	.0001	.0000	.0001	.0001	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0004	.0001	.0000	.0001	.0002	.01
386 AGG ELECTRICAL LIGHTING	.0000	.0004	.0001	.0000	.0001	.0001	.00
389 AGG COMMUNICATIONS AND E	.0039	.0123	.0049	.0041	.0090	.0099	.17
393 AGG ELECTRICAL N.E.C.	.0002	.0005	.0002	.0000	.0002	.0002	.01
406 AGG OTHER TRANSPORTATION	.0001	.0003	.0001	.0001	.0001	.0001	.01
416 AGG SCIENTIFIC AND OPTIC	.0005	.0012	.0004	.0002	.0006	.0006	.01
426 AGG MISC. MANUFACTURING	.0001	.0005	.0001	.0001	.0002	.0002	.01
446 AGG TRANSPORT. AND WAREH	.0078	.0557	.0208	.0067	.0275	.0291	.79
456 AGG UTILITIES	.0186	.0364	.0039	.0087	.0126	.0141	.15
460 AGG WHOLESALE AND RETAIL	.0420	.0475	.0219	.0053	.0272	.0342	2.46
464 AGG BANKING AND FINANCE	.0135	.0221	.0093	.0035	.0128	.0133	.48
467 AGG INSURANCE	.0052	.0111	.0041	.0006	.0047	.0051	.20
469 OWNER-OCCUPIED DWELLINGS	.0487	.0487	.0000	.0309	.0309	.0401	.00
470 REAL ESTATE	.1794	.1998	.0101	.1224	.1325	.1588	1.45
471 AGG HOTELS AND EATING PL	.0212	.0275	.0080	.0023	.0102	.0113	.94
472 AGG PERSONAL SERVICES	.0126	.0220	.0067	.0046	.0113	.0119	.48
478 AGG BUSINESS SERVICES	.0054	.0271	.0097	.0097	.0194	.0196	.54
489 ENGINEERING, ARCHITECTUR	.0000	.0515	.0262	.0082	.0344	.0351	1.18
495 AGG ENTERTAINMENT	.0046	.0051	.0013	.0009	.0023	.0031	.14
503 AGG HEALTH, EDUCA. & SOC	.0489	.0508	.0238	.0042	.0280	.0281	1.58
516 AGG FEDERAL GOVERN. ENTE	.0016	.0045	.0036	.0003	.0033	.0033	.12
519 AGG STATE GOV. ENTERPRISE	.0028	.0048	.0012	.0006	.0018	.0018	.09
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0016	.0016	.0016	.0000	.0016	.0016	.19
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	1.6115	2.0094	.5674	.3368	.9042	.9807	32.88
CHANGE IN POPULATION -	104.						

Source: Micro IMPLAN, U.S. Forest Service

Comparing these results with those above for total construction costs, shows that 55% of the direct purchases for materials associated with Moorefield flood protection project occur within those industries defined as representing levee construction.

#### 4.1.3 Labor Expenditure

An analysis was also done to estimate the economic impacts to the state resulting from only the spending of labor wages earned by those working on the flood protection project. These impacts represent consumer spending for household goods and services. This analysis was conducted in a manner similar to that for materials, that is estimating the impacts of total construction cost only of changes in final demand for consumer consumption. Estimates of these total impacts, presented in Table IV-8, are summarized below:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	0.4155	0.1180	0.0925	0.2105	0.2384	0.0279

When these impact estimates are added to those derived from evaluating only the purchase of construction materials, the values of total impact estimates of all inputs, Table IV-5 is obtained.

#### 4.2 Long Term Impacts To Whole State

The long term impacts resulting from this project are associated with the costs for routine operation and maintenance. (O&M) These costs have been estimated by the COE at \$66,000 annually, Table IV-1 and represents \$57,500 in corrected 1982 dollars. There was no separation of this annual cost into categories for materials and labor. To estimate the impacts from this expenditure, it was necessary to assume that O&M activities for the levee would be similar to O&M activities in IMPLAN's Highways & Streets. All costs were then assigned to this sector and the resulting estimates of annual impacts are as follows:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	0.0964	0.0329	0.0078	0.0406	0.0428	0.0022

From annual O&M expenditure of \$66,000, it is estimated that there will be \$96,400 worth of gross output from industries within the state, This represents an additional regional gross output valued at \$30,400 above that required for operation and maintenance activities along with \$32,900 in wages earned and \$2,200 in indirect business taxes paid to government. It should be remembered that these values are impacts to all industries in the whole state of West Virginia, and not just to the local area around the project.

Tables IV-9 to IV-12 show the estimated direct, indirect, induced and total impacts to each industry sector from annual O&M expenditures.



Table IV - 8

WAGE EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (M\$)	TGO (M\$)	EMPLOYEE COMP INCOME (M\$)	PROPERTY INC (M\$)	TOTAL INCOME (M\$)	VALUE ADDED (M\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0014	.0032	.0002	.0005	.0007	.0008	.04
22 AGG FOREST AND GREENHOUS	.0003	.0003	.0000	.0001	.0001	.0002	.01
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0002	.0001	.0000	.0001	.0001	.01
35 AGG ORE AND CHEMICAL MIN	.0002	.0011	.0004	.0002	.0005	.0006	.01
41 AGG PETROLEUM MINING	.0001	.0015	.0001	.0007	.0008	.0009	.00
44 AGG CLAY AND STONE MININ	.0000	.0000	.0000	.0000	.0000	.0000	.00
45 CRUSHED AND BROKEN LIMES	.0000	.0000	.0000	.0000	.0000	.0000	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0041	.0017	.0002	.0019	.0020	.06
79 AGG DURABLE GOODS	.0002	.0007	.0002	.0000	.0002	.0002	.01
82 AGG FOOD AND KINDRED PRO	.0100	.0115	.0022	.0011	.0033	.0034	.10
131 AGG NONDURABLE GOODS	.0056	.0092	.0021	.0009	.0030	.0031	.10
200 AGG PRINTING AND PUBLISH	.0008	.0018	.0006	.0002	.0008	.0008	.04
235 AGG PETROLEUM AND ASPHAL	.0025	.0033	.0001	.0001	.0002	.0003	.00
257 AGG STONE AND CLAY PRODU	.0001	.0001	.0000	.0000	.0001	.0001	.00
267 CONCRETE BLOCK AND BRICK	.0000	.0000	.0000	.0000	.0000	.0000	.00
306 AGG HEATING AND PLUMBING	.0000	.0001	.0000	.0000	.0000	.0000	.00
308 AGG FABRICATED METAL PRO	.0000	.0000	.0000	.0000	.0000	.0000	.00
309 AGG OTHER FABRICATED MET	.0001	.0002	.0001	.0000	.0001	.0001	.00
311 SHEET METAL WORK	.0000	.0000	.0000	.0000	.0000	.0000	.00
331 AGG MOTOR VEHICLES AND E	.0002	.0002	.0001	.0000	.0001	.0001	.00
332 AGG FARM AND GARDEN MACH	.0000	.0000	.0000	.0000	.0000	.0000	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
338 AGG MATERIALS HANDLING E	.0000	.0000	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0000	.0000	.0000	.0000	.0000	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0000	.0000	.0000	.0000	.0000	.00
386 AGG ELECTRICAL LIGHTING	.0000	.0000	.0000	.0000	.0000	.0000	.00
389 AGG COMMUNICATIONS AND E	.0039	.0054	.0021	.0018	.0039	.0043	.08
393 AGG ELECTRICAL N.E.C.	.0001	.0001	.0000	.0000	.0000	.0000	.00
406 AGG OTHER TRANSPORTATION	.0001	.0001	.0000	-.0000	.0000	.0000	.00
416 AGG SCIENTIFIC AND OPTIC	.0003	.0006	.0002	.0001	.0003	.0003	.01
426 AGG MISC. MANUFACTURING	.0001	.0001	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0051	.0079	.0030	.0010	.0039	.0041	.11
456 AGG UTILITIES	.0120	.0161	.0017	.0038	.0056	.0062	.06
460 AGG WHOLESALE AND RETAIL	.0272	.0276	.0127	.0031	.0158	.0199	1.43
464 AGG BANKING AND FINANCE	.0088	.0103	.0043	.0016	.0060	.0062	.22
467 AGG INSURANCE	.0033	.0046	.0017	.0002	.0019	.0021	.08
469 OWNER-OCCUPIED DWELLINGS	.0315	.0315	.0000	.0200	.0200	.0259	.00
470 REAL ESTATE	.0033	.0074	.0004	.0045	.0049	.0059	.05
471 AGG HOTELS AND EATING PL	.0138	.0150	.0043	.0012	.0056	.0062	.51
472 AGG PERSONAL SERVICES	.0081	.0091	.0028	.0019	.0047	.0049	.20
478 AGG BUSINESS SERVICES	.0035	.0064	.0023	.0023	.0046	.0047	.13
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0029	.0032	.0008	.0006	.0014	.0020	.09
503 AGG HEALTH, EDUCA. & SOC	.0316	.0326	.0153	.0027	.0179	.0180	1.01
516 AGG FEDERAL GOVERN. ENTE	.0011	.0017	.0014	-.0001	.0012	.0012	.05
519 AGG STATE GOV. ENTERPRISE	.0019	.0021	.0006	.0003	.0008	.0008	.04
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0010	.0010	.0010	.0000	.0010	.0010	.12
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.1809	.2205	.0626	.0491	.1117	.1265	4.60
CHANGE IN POPULATION -	14.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV - 9

O&M EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
DIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0000	.0000	.0000	.0000	.0000	.0000	.00
22 AGG FOREST AND GREENHOUS	.0000	.0000	.0000	.0000	.0000	.0000	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0000	.0000	.0000	.0000	.0000	.00
35 AGG ORE AND CHEMICAL MIN	.0000	.0000	.0000	.0000	.0000	.0000	.00
41 AGG PETROLEUM MINING	.0000	.0000	.0000	.0000	.0000	.0000	.00
44 AGG CLAY AND STONE MININ	.0000	.0000	.0000	.0000	.0000	.0000	.00
45 CRUSHED AND BROKEN LIMES	.0000	.0000	.0000	.0000	.0000	.0000	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0575	.0575	.0157	.0021	.0178	.0186	.62
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0000	.0000	.0000	.0000	.0000	.00
79 AGG DURABLE GOODS	.0000	.0000	.0000	.0000	.0000	.0000	.00
82 AGG FOOD AND KINDRED PRO	.0003	.0003	.0001	.0000	.0001	.0001	.00
131 AGG NONDURABLE GOODS	.0002	.0002	.0000	.0000	.0001	.0001	.00
200 AGG PRINTING AND PUBLISH	.0000	.0000	.0000	.0000	.0000	.0000	.00
235 AGG PETROLEUM AND ASPHAL	.0001	.0001	.0000	.0000	.0000	.0000	.00
257 AGG STONE AND CLAY PRODU	.0000	.0000	.0000	.0000	.0000	.0000	.00
267 CONCRETE BLOCK AND BRICK	.0000	.0000	.0000	.0000	.0000	.0000	.00
306 AGG HEATING AND PLUMBING	.0000	.0000	.0000	.0000	.0000	.0000	.00
308 AGG FABRICATED METAL PRO	.0000	.0000	.0000	.0000	.0000	.0000	.00
309 AGG OTHER FABRICATED MET	.0000	.0000	.0000	.0000	.0000	.0000	.00
311 SHEET METAL WORK	.0000	.0000	.0000	.0000	.0000	.0000	.00
331 AGG MOTOR VEHICLES AND E	.0000	.0000	.0000	.0000	.0000	.0000	.00
332 AGG FARM AND GARDEN MACH	.0000	.0000	.0000	.0000	.0000	.0000	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
338 AGG MATERIALS HANDLING E	.0000	.0000	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0000	.0000	.0000	.0000	.0000	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0000	.0000	.0000	.0000	.0000	.00
386 AGG ELECTRICAL LIGHTING	.0000	.0000	.0000	.0000	.0000	.0000	.00
389 AGG COMMUNICATIONS AND E	.0001	.0001	.0000	.0000	.0001	.0001	.00
393 AGG ELECTRICAL N.E.C.	.0000	.0000	.0000	.0000	.0000	.0000	.00
406 AGG OTHER TRANSPORTATION	.0000	.0000	.0000	.0000	.0000	.0000	.00
416 AGG SCIENTIFIC AND OPTIC	.0000	.0000	.0000	.0000	.0000	.0000	.00
426 AGG MISC. MANUFACTURING	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0001	.0001	.0001	.0000	.0001	.0001	.00
456 AGG UTILITIES	.0004	.0004	.0000	.0001	.0001	.0001	.00
460 AGG WHOLESALE AND RETAIL	.0008	.0008	.0004	.0001	.0005	.0006	.04
464 AGG BANKING AND FINANCE	.0003	.0003	.0001	.0000	.0001	.0002	.01
467 AGG INSURANCE	.0001	.0001	.0000	.0000	.0000	.0000	.00
469 OWNER-OCCUPIED DWELLINGS	.0009	.0009	.0000	.0006	.0006	.0008	.00
470 REAL ESTATE	.0001	.0001	.0000	.0001	.0001	.0001	.00
471 AGG HOTELS AND EATING PL	.0004	.0004	.0001	.0000	.0001	.0002	.01
472 AGG PERSONAL SERVICES	.0002	.0002	.0001	.0000	.0001	.0001	.01
478 AGG BUSINESS SERVICES	.0001	.0001	.0000	.0000	.0001	.0001	.00
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0001	.0001	.0000	.0000	.0000	.0001	.00
503 AGG HEALTH, EDUCA. & SOC	.0009	.0009	.0004	.0001	.0005	.0005	.03
516 AGG FEDERAL GOVERN. ENTE	.0000	.0000	.0000	.0000	.0000	.0000	.00
519 AGG STATE GOV. ENTERPRISE	.0001	.0001	.0000	.0000	.0000	.0000	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0628	.0628	.0172	.0033	.0205	.0217	.74
CHANGE IN POPULATION -	2.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV - 10

O&M EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
INDIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TGO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0000	.0001	.0000	.0000	.0000	.0000	.00
22 AGG FOREST AND GREENHOU	.0000	.0000	.0000	.0000	.0000	.0000	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0002	.0001	.0000	.0001	.0001	.01
35 AGG ORE AND CHEMICAL MIN	.0000	.0001	.0000	.0000	.0000	.0001	.00
41 AGG PETROLEUM MINING	.0000	.0005	.0000	.0002	.0002	.0003	.00
44 AGG CLAY AND STONE MININ	.0000	.0005	.0002	.0001	.0003	.0003	.01
45 CRUSHED AND BROKEN LIMES	.0000	.0003	.0001	.0001	.0002	.0002	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0005	.0002	.0000	.0002	.0002	.01
79 AGG DURABLE GOODS	.0000	.0006	.0002	.0000	.0002	.0002	.01
82 AGG FOOD AND KINDRED PRO	.0000	.0001	.0000	.0000	.0000	.0000	.00
131 AGG NONDURABLE GOODS	.0000	.0007	.0002	.0001	.0002	.0002	.01
200 AGG PRINTING AND PUBLISH	.0000	.0001	.0000	.0000	.0000	.0000	.00
235 AGG PETROLEUM AND ASPHAL	.0000	.0040	.0002	.0001	.0003	.0004	.00
257 AGG STONE AND CLAY PRODU	.0000	.0019	.0005	.0001	.0007	.0007	.06
267 CONCRETE BLOCK AND BRICK	.0000	.0000	.0000	.0000	.0000	.0000	.00
306 AGG HEATING AND PLUMBING	.0000	.0000	.0000	.0000	.0000	.0000	.00
308 AGG FABRICATED METAL PRO	.0000	.0005	.0001	.0000	.0002	.0002	.01
309 AGG OTHER FABRICATED MET	.0000	.0001	.0000	.0000	.0001	.0001	.00
311 SHEET METAL WORK	.0000	.0001	.0000	.0000	.0000	.0000	.00
331 AGG MOTOR VEHICLES AND E	.0000	.0000	.0000	.0000	.0000	.0000	.00
332 AGG FARM AND GARDEN MACH	.0000	.0000	.0000	.0000	.0000	.0000	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
338 AGG MATERIALS HANDLING E	.0000	.0000	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0000	.0000	.0000	.0000	.0000	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0000	.0000	.0000	.0000	.0000	.00
386 AGG ELECTRICAL LIGHTING	.0000	.0000	.0000	.0000	.0000	.0000	.00
389 AGG COMMUNICATIONS AND E	.0000	.0002	.0001	.0001	.0002	.0002	.00
393 AGG ELECTRICAL N.E.C.	.0000	.0000	.0000	.0000	.0000	.0000	.00
406 AGG OTHER TRANSPORTATION	.0000	.0000	.0000	.0000	.0000	.0000	.00
416 AGG SCIENTIFIC AND OPTIC	.0000	.0000	.0000	.0000	.0000	.0000	.00
426 AGG MISC. MANUFACTURING	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0000	.0027	.0010	.0003	.0013	.0014	.04
450 AGG UTILITIES	.0000	.0005	.0001	.0001	.0002	.0002	.00
460 AGG WHOLESALE AND RETAIL	.0000	.0002	.0001	.0000	.0001	.0002	.01
464 AGG BANKING AND FINANCE	.0000	.0003	.0001	.0000	.0002	.0002	.01
467 AGG INSURANCE	.0000	.0002	.0001	.0000	.0001	.0001	.00
469 OWNER-OCCUPIED DWELLINGS	.0000	.0000	.0000	.0000	.0000	.0000	.00
470 REAL ESTATE	.0000	.0003	.0000	.0002	.0002	.0003	.00
471 AGG HOTELS AND EATING PL	.0000	.0002	.0001	.0000	.0001	.0001	.01
472 AGG PERSONAL SERVICES	.0000	.0005	.0002	.0001	.0003	.0003	.01
478 AGG BUSINESS SERVICES	.0000	.0009	.0003	.0003	.0006	.0006	.02
489 ENGINEERING, ARCHITECTUR	.0000	.0035	.0018	.0005	.0023	.0024	.08
495 AGG ENTERTAINMENT	.0000	.0000	.0000	.0000	.0000	.0000	.00
503 AGG HEALTH, EDUCA. & SOC	.0000	.0000	.0000	.0000	.0000	.0000	.00
516 AGG FEDERAL GOVERN. ENTE	.0000	.0001	.0001	.0000	.0001	.0001	.00
519 AGG STATE GOV. ENTERPRISE	.0000	.0001	.0000	.0000	.0000	.0000	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0000	.0200	.0058	.0027	.0085	.0091	.30
CHANGE IN POPULATION -	1.						

Source: Micro IMPLAN, U.S. Forest service

Table IV - 11

O&M EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
INDUCED CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0001	.0002	.0000	.0000	.0000	.0000	.00
22 AGG FOREST AND GREENHOUS	.0000	.0000	.0000	.0000	.0000	.0000	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0000	.0000	.0000	.0000	.0000	.00
35 AGG ORE AND CHEMICAL MIN	.0000	.0001	.0000	.0000	.0000	.0000	.00
41 AGG PETROLEUM MINING	.0000	.0001	.0000	.0000	.0000	.0000	.00
44 AGG CLAY AND STONE MININ	.0000	.0000	.0000	.0000	.0000	.0000	.00
45 CRUSHED AND BROKEN LIMES	.0000	.0000	.0000	.0000	.0000	.0000	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0002	.0001	.0000	.0001	.0001	.00
79 AGG DURABLE GOODS	.0000	.0000	.0000	.0000	.0000	.0000	.00
82 AGG FOOD AND KINDRED PRO	.0005	.0006	.0001	.0001	.0002	.0002	.01
131 AGG NONDURABLE GOODS	.0003	.0004	.0001	.0000	.0001	.0002	.00
200 AGG PRINTING AND PUBLISH	.0000	.0001	.0000	.0000	.0000	.0000	.00
235 AGG PETROLEUM AND ASPHAL	.0001	.0002	.0000	.0000	.0000	.0000	.00
257 AGG STONE AND CLAY PRODU	.0000	.0000	.0000	.0000	.0000	.0000	.00
267 CONCRETE BLOCK AND BRICK	.0000	.0000	.0000	.0000	.0000	.0000	.00
306 AGG HEATING AND PLUMBING	.0000	.0000	.0000	.0000	.0000	.0000	.00
308 AGG FABRICATED METAL PRO	.0000	.0000	.0000	.0000	.0000	.0000	.00
309 AGG OTHER FABRICATED MET	.0000	.0000	.0000	.0000	.0000	.0000	.00
311 SHEET METAL WORK	.0000	.0000	.0000	.0000	.0000	.0000	.00
331 AGG MOTOR VEHICLES AND E	.0000	.0000	.0000	.0000	.0000	.0000	.00
332 AGG FARM AND GARDEN MACH	.0000	.0000	.0000	.0000	.0000	.0000	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
338 AGG MATERIALS HANDLING E	.0000	.0000	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0000	.0000	.0000	.0000	.0000	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0000	.0000	.0000	.0000	.0000	.00
386 AGG ELECTRICAL LIGHTING	.0000	.0000	.0000	.0000	.0000	.0000	.00
389 AGG COMMUNICATIONS AND E	.0002	.0003	.0001	.0001	.0002	.0002	.00
393 AGG ELECTRICAL N.E.C.	.0000	.0000	.0000	.0000	.0000	.0000	.00
406 AGG OTHER TRANSPORTATION	.0000	.0000	.0000	.0000	.0000	.0000	.00
416 AGG SCIENTIFIC AND OPTIC	.0000	.0000	.0000	.0000	.0000	.0000	.00
426 AGG MISC. MANUFACTURING	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0002	.0004	.0001	.0000	.0002	.0002	.01
456 AGG UTILITIES	.0006	.0008	.0001	.0002	.0003	.0003	.00
460 AGG WHOLESALE AND RETAIL	.0013	.0014	.0006	.0002	.0008	.0010	.07
464 AGG BANKING AND FINANCE	.0004	.0005	.0002	.0001	.0003	.0003	.01
467 AGG INSURANCE	.0002	.0002	.0001	.0000	.0001	.0001	.00
469 OWNER-OCCUPIED DWELLINGS	.0015	.0015	.0000	.0010	.0010	.0013	.00
470 REAL ESTATE	.0002	.0004	.0000	.0002	.0002	.0003	.00
471 AGG HOTELS AND EATING PL	.0007	.0007	.0002	.0001	.0003	.0003	.03
472 AGG PERSONAL SERVICES	.0004	.0004	.0001	.0001	.0002	.0002	.01
478 AGG BUSINESS SERVICES	.0002	.0003	.0001	.0001	.0002	.0002	.01
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0001	.0002	.0000	.0000	.0001	.0001	.00
503 AGG HEALTH, EDUCA. & SOC	.0016	.0016	.0008	.0001	.0009	.0009	.05
516 AGG FEDERAL GOVERN. ENTE	.0001	.0001	.0001	.0000	.0001	.0001	.00
519 AGG STATE GOV. ENTERPRISE	.0001	.0001	.0000	.0000	.0000	.0000	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.01
TOTAL	.0089	.0108	.0031	.0024	.0055	.0062	.23
CHANGE IN POPULATION -	1.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV - 12

O&M EXPENDITURES - MOOREFIELD FLOOD PROJECT (STATE)  
TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0001	.0003	.0000	.0000	.0001	.0001	.00
22 AGG FOREST AND GREENHOUS	.0000	.0000	.0000	.0000	.0000	.0000	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0002	.0001	.0000	.0001	.0001	.01
35 AGG ORE AND CHEMICAL MIN	.0000	.0002	.0001	.0000	.0001	.0001	.00
41 AGG PETROLEUM MINING	.0000	.0005	.0000	.0002	.0003	.0003	.00
44 AGG CLAY AND STONE MININ	.0000	.0005	.0002	.0001	.0003	.0003	.01
45 CRUSHED AND BROKEN LIMES	.0000	.0003	.0001	.0001	.0002	.0002	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0575	.0575	.0157	.0021	.0178	.0186	.62
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0007	.0003	.0000	.0003	.0003	.01
79 AGG DURABLE GOODS	.0000	.0006	.0002	.0000	.0002	.0002	.01
82 AGG FOOD AND KINDRED PRO	.0008	.0009	.0002	.0001	.0003	.0003	.01
131 AGG NONDURABLE GOODS	.0004	.0013	.0003	.0001	.0004	.0004	.01
200 AGG PRINTING AND PUBLISH	.0001	.0002	.0001	.0000	.0001	.0001	.00
235 AGG PETROLEUM AND ASPHAL	.0002	.0042	.0002	.0001	.0003	.0004	.00
257 AGG STONE AND CLAY PRODU	.0000	.0019	.0006	.0001	.0007	.0007	.06
267 CONCRETE BLOCK AND BRICK	.0000	.0000	.0000	.0000	.0000	.0000	.00
306 AGG HEATING AND PLUMBING	.0000	.0000	.0000	.0000	.0000	.0000	.00
308 AGG FABRICATED METAL PRO	.0000	.0005	.0001	.0000	.0002	.0002	.01
309 AGG OTHER FABRICATED MET	.0000	.0001	.0000	.0000	.0001	.0001	.00
311 SHEET METAL WORK	.0000	.0001	.0000	.0000	.0000	.0001	.00
331 AGG MOTOR VEHICLES AND E	.0000	.0000	.0000	.0000	.0000	.0000	.00
332 AGG FARM AND GARDEN MACH	.0000	.0000	.0000	.0000	.0000	.0000	.00
334 AGG CONSTRUCTION MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
338 AGG MATERIALS HANDLING E	.0000	.0000	.0000	.0000	.0000	.0000	.00
352 SPECIAL INDUSTRY MACHINE	.0000	.0000	.0000	.0000	.0000	.0000	.00
353 AGG GENERAL INDUS. EQUIP	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
362 AGG OFFICE MACHINES	.0000	.0000	.0000	.0000	.0000	.0000	.00
366 AGG SERVICE INDUSTRY MAC	.0000	.0000	.0000	.0000	.0000	.0000	.00
371 AGG ELECTRICAL INDUSTRIA	.0000	.0000	.0000	.0000	.0000	.0000	.00
386 AGG ELECTRICAL LIGHTING	.0000	.0000	.0000	.0000	.0000	.0000	.00
389 AGG COMMUNICATIONS AND E	.0003	.0006	.0002	.0002	.0004	.0005	.01
393 AGG ELECTRICAL N.E.C.	.0000	.0000	.0000	.0000	.0000	.0000	.00
406 AGG OTHER TRANSPORTATION	.0000	.0000	.0000	.0000	.0000	.0000	.00
416 AGG SCIENTIFIC AND OPTIC	.0000	.0001	.0000	.0000	.0000	.0000	.00
426 AGG MISC. MANUFACTURING	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0004	.0032	.0012	.0004	.0016	.0017	.05
456 AGG UTILITIES	.0009	.0017	.0002	.0004	.0006	.0007	.01
460 AGG WHOLESALE AND RETAIL	.0021	.0024	.0011	.0003	.0014	.0017	.12
464 AGG BANKING AND FINANCE	.0007	.0011	.0005	.0002	.0006	.0006	.02
467 AGG INSURANCE	.0003	.0005	.0002	.0000	.0002	.0002	.01
469 OWNER-OCCUPIED DWELLINGS	.0025	.0025	.0000	.0016	.0016	.0020	.00
470 REAL ESTATE	.0003	.0008	.0000	.0005	.0005	.0006	.01
471 AGG HOTELS AND EATING PL	.0011	.0014	.0004	.0001	.0005	.0006	.05
472 AGG PERSONAL SERVICES	.0006	.0012	.0004	.0002	.0006	.0006	.03
478 AGG BUSINESS SERVICES	.0003	.0013	.0005	.0005	.0009	.0010	.03
489 ENGINEERING, ARCHITECTUR	.0000	.0035	.0018	.0005	.0023	.0024	.08
493 AGG ENTERTAINMENT	.0002	.0003	.0001	.0000	.0001	.0002	.01
503 AGG HEALTH, EDUCA. & SOC	.0025	.0026	.0012	.0002	.0014	.0014	.08
516 AGG FEDERAL GOVERN. ENTE	.0001	.0002	.0002	-.0000	.0001	.0001	.01
519 AGG STATE GOV. ENTERPRISE	.0001	.0002	.0001	.0000	.0001	.0001	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0001	.0001	.0001	.0000	.0001	.0001	.01
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0717	.0937	.0261	.0085	.0345	.0370	1.27
CHANGE IN POPULATION -	4.						

Source: Micro IMPLAN, U.S. Forest service

### 4.3 Short Term Impacts to Hardy County

Annual short term impacts to Hardy County were estimated for the three years during construction of the flood protection project. These impacts were derived from Micro IMPLAN using the input sectors and construction costs as presented in Table III-3 applied to Hardy County as the defined region. The 528 industry sectors were aggregated using the same aggregation pattern as for the whole state. Because some industry sectors are not represented in Hardy County, there are fewer total number of industries after aggregation than in the state-wide model. Estimated impacts were derived for both the combined and separate input expenditures for materials and labor.

#### 4.3.1. Total Input Expenditures

Tables IV-13 to IV-16 show the estimated direct, indirect, induced and total annual impacts to each industry sector in Hardy County from the flood protection project in Moorefield, West Virginia. These estimated impacts represent the purchase of construction materials combined with consumer's purchase of goods and services with construction wages. Below is a summary of these impacts:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Direct Impact	3.0677	0.8603	0.4984	1.3586	1.4668	0.1082
Indirect Impact	0.2486	0.0939	0.0764	0.1359	0.1438	0.0079
Induced Impact	0.3385	0.0938	0.0821	0.1760	0.2049	0.0289
Total Impact	3.6549	1.0480	0.6225	1.6705	1.8155	0.1450

As shown by these results, annual construction expenditures of \$3.041 million for materials and labor would produce additional gross industry output to Hardy County valued at \$3.66 million. These total construction expenditures would also produce \$1.05 million in new employee wages and \$0.145 million of indirect business taxes to the government.

As expected, these estimated impacts resulting from the same value of changes in final demand in the same industry sectors, are lower in Hardy County than in the whole state. Because the region defined by the county is smaller and has less economic interactions than the whole state of West Virginia, the amount of impacts produced are correspondingly smaller. It should be noted that in certain industries listed in Tables IV-13 to IV-16 the results are negative values. This represents either an estimate of the loss in wages, income or taxes or the value of government payments (subsidies or services).

#### 4.3.2 Materials Expenditure

The estimated impacts derived from the purchase of materials necessary for the construction of the flood protection project were evaluated separate from those of the consumer spending of wages by construction labor. Table IV-17 presents the estimated total impact results of this evaluation which are summarized below:

Table IV-13

TOTAL EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
DIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TGO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0042	.0042	.0002	.0003	.0006	.0006	.04
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.4302	.4302	.2032	.1025	.3056	.3159	13.20
45 CRUSHED AND BROKEN LIMES	.1550	.1550	.0482	.0355	.0836	.0901	1.75
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0357	.0357	.0126	.0012	.0138	.0142	.67
69 NEW HIGHWAYS AND STREETS	1.5965	1.5965	.4353	.0593	.4946	.5163	14.15
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0000	.0000	.0000	.0000	.0000	.00
84 AGG FOOD AND KINDRED PRO	.0024	.0024	.0004	.0001	.0005	.0006	.04
151 AGG NONDURABLE GOODS	.0025	.0025	.0009	.0003	.0012	.0012	.10
160 AGG DURABLE GOODS	.0003	.0003	.0001	.0000	.0001	.0001	.01
200 NEWSPAPERS	.0004	.0004	.0001	.0000	.0002	.0002	.01
272 CUT STONE AND STONE PROD	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
395 ELECTRONIC COMPONENTS, N	.0002	.0002	.0000	.0000	.0001	.0001	.00
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0002	.0002	.0000	.0000	.0001	.0001	.01
446 AGG TRANSPORT. AND WAREH	.0033	.0033	.0014	.0005	.0019	.0020	.07
454 COMMUNICATIONS, EXCEPT R	.0036	.0036	.0016	.0014	.0029	.0033	.05
457 GAS PRODUCTION AND DISTR	.0044	.0044	.0003	.0005	.0008	.0010	.01
461 AGG WHOLESALE AND RETAIL	.0277	.0277	.0128	.0031	.0159	.0200	1.47
464 AGG BANKING AND FINANCE	.0074	.0074	.0029	.0013	.0042	.0043	.16
467 AGG INSURANCE	.0005	.0005	.0002	.0000	.0002	.0002	.01
469 OWNER-OCCUPIED DWELLINGS	.0296	.0296	.0000	.0188	.0188	.0243	.00
470 REAL ESTATE	.3348	.3348	.0169	.2052	.2221	.2662	3.73
471 AGG HOTELS AND EATING PL	.0128	.0128	.0037	.0010	.0047	.0053	.42
472 AGG PERSONAL SERVICES	.0058	.0058	.0017	.0010	.0027	.0029	.14
478 AGG BUSINESS SERVICES	.0014	.0014	.0005	.0006	.0010	.0010	.04
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0013	.0013	.0004	.0002	.0006	.0008	.04
503 AGG HEALTH, EDUCA. & SOC	.0103	.0103	.0043	.0014	.0057	.0057	.35
516 AGG FEDERAL GOVERN. ENTE	.0011	.0011	.0009	-.0001	.0008	.0008	.03
519 AGG STATE GOV. ENTERPRISE	.0019	.0019	.0005	.0002	.0007	.0007	.04
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0009	.0009	.0009	.0000	.0009	.0009	.11
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	2.6743	2.6743	.7500	.4345	1.1844	1.2787	36.64
CHANGE IN POPULATION -	123.						

Table IV-14

TOTAL EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
INDIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TGO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0000	.0027	.0001	.0002	.0004	.0004	.03
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0103	.0049	.0025	.0074	.0076	.32
45 CRUSHED AND BROKEN LIMES	.0000	.0226	.0070	.0052	.0122	.0131	.25
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0251	.0108	.0008	.0116	.0120	.44
84 AGG FOOD AND KINDRED PRO	.0000	.0004	.0001	.0000	.0001	.0001	.01
151 AGG NONDURABLE GOODS	.0000	.0003	.0001	.0000	.0001	.0001	.01
160 AGG DURABLE GOODS	.0000	.0025	.0008	.0001	.0009	.0010	.06
200 NEWSPAPERS	.0000	.0037	.0013	.0003	.0016	.0017	.07
272 CUT STONE AND STONE PROD	.0000	.0004	.0001	.0000	.0002	.0002	.01
361 MACHINERY, EXCEPT ELECTR	.0000	.0001	.0000	.0000	.0001	.0001	.00
395 ELECTRONIC COMPONENTS, N	.0000	.0008	.0002	.0000	.0003	.0003	.01
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0000	.0005	.0001	.0001	.0002	.0002	.02
446 AGG TRANSPORT. AND WAREH	.0000	.0638	.0268	.0089	.0357	.0374	1.28
454 COMMUNICATIONS, EXCEPT R	.0000	.0035	.0015	.0013	.0028	.0031	.05
457 GAS PRODUCTION AND DISTR	.0000	.0071	.0005	.0009	.0014	.0015	.02
461 AGG WHOLESALE AND RETAIL	.0000	.0075	.0035	.0008	.0043	.0054	.40
464 AGG BANKING AND FINANCE	.0000	.0099	.0038	.0018	.0056	.0058	.21
467 AGG INSURANCE	.0000	.0012	.0005	.0001	.0005	.0006	.02
469 OWNER-OCCUPIED DWELLINGS	.0000	.0000	.0000	.0000	.0000	.0000	.00
470 REAL ESTATE	.0000	.0075	.0004	.0046	.0050	.0060	.08
471 AGG HOTELS AND EATING PL	.0000	.0049	.0014	.0004	.0018	.0020	.16
472 AGG PERSONAL SERVICES	.0000	.0080	.0023	.0014	.0037	.0040	.19
478 AGG BUSINESS SERVICES	.0000	.0121	.0040	.0046	.0087	.0088	.33
489 ENGINEERING, ARCHITECTUR	.0000	.0150	.0077	.0024	.0101	.0102	.34
495 AGG ENTERTAINMENT	.0000	.0001	.0000	.0000	.0000	.0001	.00
503 AGG HEALTH, EDUCA. & SOC	.0000	.0003	.0001	.0000	.0002	.0002	.01
516 AGG FEDERAL GOVERN. ENTE	.0000	.0035	.0028	-.0002	.0026	.0026	.09
519 AGG STATE GOV. ENTERPRISE	.0000	.0029	.0008	.0004	.0011	.0011	.06
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0000	.2167	.0819	.0366	.1185	.1254	4.49
CHANGE IN POPULATION -	15.						

Source: Micro IMPLAN, U.S. Forest Service



Table IV-15

TOTAL EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
INDUCED CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0091	.0142	.0008	.0012	.0019	.0021	.14
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0006	.0003	.0002	.0004	.0005	.02
45 CRUSHED AND BROKEN LIMES	.0000	.0001	.0000	.0000	.0000	.0000	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0065	.0028	.0002	.0030	.0031	.11
84 AGG FOOD AND KINDRED PRO	.0052	.0060	.0010	.0003	.0013	.0014	.10
151 AGG NONDURABLE GOODS	.0054	.0055	.0019	.0007	.0026	.0026	.22
160 AGG DURABLE GOODS	.0006	.0008	.0003	.0000	.0003	.0003	.02
200 NEWSPAPERS	.0008	.0028	.0010	.0002	.0012	.0013	.06
272 CUT STONE AND STONE PROD	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
395 ELECTRONIC COMPONENTS, N	.0004	.0005	.0002	.0000	.0002	.0002	.00
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0002	.0003	.0001	.0000	.0001	.0002	.02
446 AGG TRANSPORT. AND WAREH	.0071	.0097	.0041	.0014	.0054	.0057	.20
454 COMMUNICATIONS, EXCEPT R	.0078	.0086	.0037	.0033	.0070	.0077	.12
457 GAS PRODUCTION AND DISTR	.0095	.0126	.0009	.0015	.0024	.0027	.03
461 AGG WHOLESALE AND RETAIL	.0591	.0595	.0276	.0066	.0342	.0431	3.17
464 AGG BANKING AND FINANCE	.0157	.0175	.0068	.0031	.0099	.0102	.38
467 AGG INSURANCE	.0010	.0013	.0005	.0001	.0006	.0006	.03
469 OWNER-OCCUPIED DWELLINGS	.0632	.0632	.0000	.0401	.0401	.0520	.00
470 REAL ESTATE	.0024	.0040	.0002	.0025	.0027	.0032	.05
471 AGG HOTELS AND EATING PL	.0273	.0284	.0082	.0023	.0105	.0117	.94
472 AGG PERSONAL SERVICES	.0125	.0133	.0038	.0023	.0062	.0066	.31
478 AGG BUSINESS SERVICES	.0030	.0041	.0014	.0016	.0030	.0030	.11
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0028	.0029	.0009	.0005	.0014	.0017	.08
503 AGG HEALTH, EDUCA. & SOC	.0220	.0226	.0095	.0030	.0125	.0125	.76
516 AGG FEDERAL GOVERN. ENTE	.0024	.0033	.0026	-.0002	.0024	.0024	.09
519 AGG STATE GOV. ENTERPRISE	.0040	.0043	.0012	.0005	.0017	.0017	.09
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0020	.0020	.0020	.0000	.0020	.0020	.24
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.2635	.2951	.0818	.0716	.1534	.1786	7.29
CHANGE IN POPULATION -	24.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV-16

TOTAL EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (M\$)	TGO (M\$)	EMPLOYEE COMP INCOME (M\$)	PROPERTY INC (M\$)	TOTAL INCOME (M\$)	VALUE ADDED (M\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0133	.0211	.0011	.0017	.0029	.0032	.21
26 AGRICULTURAL, FORESTRY,	.0000	.0001	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.4302	.4411	.2084	.1051	.3134	.3240	13.54
45 CRUSHED AND BROKEN LIMES	.1550	.1776	.0552	.0407	.0958	.1033	2.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0357	.0357	.0126	.0012	.0138	.0142	.67
69 NEW HIGHWAYS AND STREETS	1.5965	1.5965	.4353	.0593	.4946	.5163	14.15
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0316	.0137	.0010	.0147	.0151	.55
84 AGG FOOD AND KINDRED PRO	.0076	.0088	.0015	.0005	.0020	.0020	.15
151 AGG NONDURABLE GOODS	.0079	.0083	.0028	.0011	.0039	.0039	.33
160 AGG DURABLE GOODS	.0009	.0036	.0012	.0002	.0013	.0014	.08
200 NEWSPAPERS	.0012	.0069	.0025	.0006	.0030	.0031	.14
272 CUT STONE AND STONE PROD	.0000	.0004	.0002	.0000	.0002	.0002	.01
361 MACHINERY, EXCEPT ELECTR	.0000	.0001	.0001	.0000	.0001	.0001	.00
395 ELECTRONIC COMPONENTS, N	.0005	.0015	.0004	.0001	.0005	.0005	.01
423 OPTICAL INSTRUMENTS AND	.0000	.0001	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0004	.0010	.0003	.0001	.0004	.0004	.05
446 AGG TRANSPORT. AND WAREH	.0104	.0769	.0323	.0107	.0430	.0450	1.54
454 COMMUNICATIONS, EXCEPT R	.0114	.0157	.0067	.0060	.0127	.0141	.21
457 GAS PRODUCTION AND DISTR	.0139	.0241	.0017	.0029	.0046	.0052	.06
461 AGG WHOLESALE AND RETAIL	.0867	.0946	.0439	.0105	.0544	.0685	5.04
464 AGG BANKING AND FINANCE	.0231	.0347	.0135	.0062	.0196	.0202	.75
467 AGG INSURANCE	.0014	.0029	.0011	.0002	.0013	.0014	.06
469 OWNER-OCCUPIED DWELLINGS	.0928	.0928	.0000	.0589	.0589	.0764	.00
470 REAL ESTATE	.3372	.3464	.0175	.2123	.2297	.2754	3.86
471 AGG HOTELS AND EATING PL	.0401	.0461	.0134	.0037	.0171	.0189	1.52
472 AGG PERSONAL SERVICES	.0183	.0271	.0078	.0048	.0126	.0134	.64
478 AGG BUSINESS SERVICES	.0045	.0176	.0059	.0068	.0127	.0128	.49
489 ENGINEERING, ARCHITECTUR	.0000	.0150	.0077	.0024	.0101	.0103	.34
495 AGG ENTERTAINMENT	.0040	.0043	.0013	.0008	.0021	.0025	.12
503 AGG HEALTH, EDUCA. & SOC	.0323	.0333	.0139	.0045	.0184	.0184	1.12
516 AGG FEDERAL GOVERN. ENTE	.0035	.0080	.0063	-.0005	.0058	.0058	.21
519 AGG STATE GOV. ENTERPRISE	.0059	.0092	.0024	.0011	.0036	.0036	.20
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0029	.0029	.0029	.0000	.0029	.0029	.36
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	2.9379	3.1862	.9136	.5427	1.4563	1.5827	48.42
CHANGE IN POPULATION -	162.						

Source: Micro IMPLAN, U.S. Forest Service

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	3.4684	.9963	.5773	1.5736	1.7026	.1290

The purchase of goods and services for the construction of flood protection projects in Moorefield, West Virginia would generate a total of \$3.4684 million in gross output from all impacted industries in Hardy County. This level of output would yield an annual increase of \$0.9963 million in wages to the county and \$0.1290 million in indirect business taxes. These estimated impacts would be produced from the annual total construction costs of \$3.041 million.

#### 4.3.3 Labor Expenditure

An estimate was made of impact to Hardy County from the purchase of household goods and services with the labor wages earned from the construction project. These impacts added to those estimates from the expenditure for construction materials, constitute the value of estimated impacts from all input expenditures, Table IV-15. Total impacts to all other industries are presented in Table IV-18 and are summarized as follows:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Total Impact	0.1859	0.0515	0.0451	0.0967	0.1125	0.0158

As the wages and salaries earned from the construction project purchase general consumer goods and services, it is estimated that an additional \$0.1859 million of industry output would result. From the manufacturing and sales of these goods, there would be employee wages earned estimated to be \$0.0515 million and \$0.0451 million and \$0.0451 million of income to business and property owners..

#### 4.4 Long Term Impacts to Hardy County

Long term impacts to Hardy County from the flood protection projects in Moorefield, West Virginia arise from the annual expenses for operation and maintenance of the levees. These annual costs, estimated by the Corps of Engineers to be \$66,000 (Table IV-1) would produce the following yearly impacts to the county:

(Million 1988 Dollars)

	Tot.Gross Output	Employee Income	Property Income	Total Income	Value Added	Business Taxes
Direct Impact	0.0692	0.0188	0.0032	0.0221	0.0233	0.0011
Indirect Impact	0.0063	0.0024	0.0010	0.0036	0.0038	0.0002
Induced Impact	0.0049	0.0014	0.0011	0.0025	0.0030	0.0005
Total Impact	0.0803	0.0227	0.0055	0.0282	0.0301	0.0018

Table IV-17

MATERIALS EXPENDITURE - MOOREFIELD FLOOD PROJECT (COUNTY)  
TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TGO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0083	.0133	.0007	.0011	.0018	.0020	.13
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.4302	.4408	.2082	.1050	.3132	.3238	13.53
45 CRUSHED AND BROKEN LIMES	.1550	.1775	.0552	.0406	.0958	.1033	2.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0357	.0357	.0126	.0012	.0138	.0142	.67
69 NEW HIGHWAYS AND STREETS	1.5965	1.5965	.4353	.0593	.4946	.5163	14.15
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0280	.0121	.0009	.0130	.0134	.49
84 AGG FOOD AND KINDRED PRO	.0048	.0055	.0009	.0003	.0012	.0013	.09
151 AGG NONDURABLE GOODS	.0050	.0053	.0018	.0007	.0025	.0025	.21
160 AGG DURABLE GOODS	.0006	.0032	.0010	.0002	.0012	.0012	.07
200 NEWSPAPERS	.0008	.0053	.0019	.0004	.0024	.0024	.11
272 CUT STONE AND STONE PROD	.0000	.0004	.0002	.0000	.0002	.0002	.01
361 MACHINERY, EXCEPT ELECTR	.0000	.0001	.0001	.0000	.0001	.0001	.00
395 ELECTRONIC COMPONENTS, N	.0004	.0012	.0004	.0001	.0004	.0004	.01
423 OPTICAL INSTRUMENTS AND	.0000	.0001	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0002	.0007	.0002	.0001	.0003	.0003	.04
446 AGG TRANSPORT. AND WAREH	.0065	.0715	.0300	.0100	.0400	.0419	1.44
454 COMMUNICATIONS, EXCEPT R	.0071	.0110	.0047	.0042	.0089	.0098	.15
457 GAS PRODUCTION AND DISTR	.0087	.0172	.0012	.0021	.0033	.0037	.05
461 AGG WHOLESALE AND RETAIL	.0541	.0618	.0287	.0069	.0356	.0448	3.29
464 AGG BANKING AND FINANCE	.0144	.0251	.0097	.0045	.0142	.0146	.54
467 AGG INSURANCE	.0009	.0022	.0009	.0001	.0010	.0011	.05
469 OWNER-OCCUPIED DWELLINGS	.0580	.0580	.0000	.0368	.0368	.0477	.00
470 REAL ESTATE	.3359	.3441	.0173	.2109	.2283	.2736	3.83
471 AGG HOTELS AND EATING PL	.0250	.0304	.0088	.0024	.0113	.0125	1.00
472 AGG PERSONAL SERVICES	.0114	.0198	.0057	.0035	.0092	.0098	.47
478 AGG BUSINESS SERVICES	.0028	.0153	.0051	.0059	.0110	.0111	.42
489 ENGINEERING, ARCHITECTUR	.0000	.0150	.0077	.0024	.0101	.0103	.34
495 AGG ENTERTAINMENT	.0025	.0027	.0008	.0005	.0013	.0016	.08
503 AGG HEALTH, EDUCA. & SOC	.0201	.0208	.0087	.0028	.0115	.0115	.70
516 AGG FEDERAL GOVERN. ENTE	.0022	.0061	.0049	-.0004	.0044	.0044	.16
519 AGG STATE GOV. ENTERPRISE	.0037	.0068	.0018	.0008	.0026	.0026	.15
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0018	.0018	.0018	.0000	.0018	.0018	.22
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	2.7927	3.0236	.8685	.5033	1.3718	1.4843	44.40
CHANGE IN POPULATION -	149.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV-18

WAGE EXPENDITURE - MOOREFIELD FLOOD PROJECT (COUNTY)  
TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TGO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0050	.0078	.0004	.0006	.0011	.0012	.08
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0003	.0002	.0001	.0002	.0002	.01
45 CRUSHED AND BROKEN LIMES	.0000	.0000	.0000	.0000	.0000	.0000	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0036	.0016	.0001	.0017	.0017	.06
84 AGG FOOD AND KINDRED PRO	.0028	.0033	.0006	.0002	.0007	.0007	.05
151 AGG NONDURABLE GOODS	.0029	.0030	.0010	.0004	.0014	.0014	.12
160 AGG DURABLE GOODS	.0004	.0005	.0001	.0000	.0002	.0002	.01
200 NEWSPAPERS	.0004	.0015	.0006	.0001	.0007	.0007	.03
272 CUT STONE AND STONE PROD	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
395 ELECTRONIC COMPONENTS, N	.0002	.0003	.0001	.0000	.0001	.0001	.00
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0002	.0002	.0001	.0000	.0001	.0001	.01
446 AGG TRANSPORT. AND WAREH	.0039	.0054	.0023	.0007	.0030	.0031	.11
454 COMMUNICATIONS, EXCEPT R	.0043	.0047	.0020	.0018	.0038	.0042	.06
457 GAS PRODUCTION AND DISTR	.0052	.0069	.0005	.0008	.0013	.0015	.02
461 AGG WHOLESALE AND RETAIL	.0325	.0327	.0152	.0036	.0188	.0237	1.74
464 AGG BANKING AND FINANCE	.0086	.0096	.0037	.0017	.0054	.0056	.21
467 AGG INSURANCE	.0005	.0007	.0003	.0000	.0003	.0003	.01
469 OWNER-OCCUPIED DWELLINGS	.0347	.0347	.0000	.0220	.0220	.0286	.00
470 REAL ESTATE	.0013	.0022	.0001	.0014	.0015	.0018	.02
471 AGG HOTELS AND EATING PL	.0150	.0157	.0045	.0013	.0058	.0064	.52
472 AGG PERSONAL SERVICES	.0069	.0073	.0021	.0013	.0034	.0036	.17
478 AGG BUSINESS SERVICES	.0017	.0023	.0008	.0009	.0016	.0017	.06
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0015	.0016	.0005	.0003	.0008	.0009	.05
503 AGG HEALTH, EDUCA. & SOC	.0121	.0125	.0052	.0017	.0069	.0069	.42
516 AGG FEDERAL GOVERN. ENTE	.0013	.0019	.0015	-.0001	.0014	.0014	.05
519 AGG STATE GOV. ENTERPRISE	.0022	.0024	.0006	.0003	.0009	.0009	.05
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0011	.0011	.0011	.0000	.0011	.0011	.13
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.1448	.1621	.0449	.0393	.0843	.0981	4.01
CHANGE IN POPULATION -	13.						

Source: Micro IMPLAN, U.S. Forest Service

Tables IV-19 to IV-22 show the estimated direct, indirect, induced and total impacts to individual industries in Hardy County resulting from the annual operating and maintenance expenses.

Table IV-19

OPERATION & MAINT. EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
DIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TGO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0001	.0001	.0000	.0000	.0000	.0000	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0000	.0000	.0000	.0000	.0000	.00
45 CRUSHED AND BROKEN LIMES	.0000	.0000	.0000	.0000	.0000	.0000	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0575	.0575	.0157	.0021	.0178	.0186	.51
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0000	.0000	.0000	.0000	.0000	.00
84 AGG FOOD AND KINDRED PRO	.0001	.0001	.0000	.0000	.0000	.0000	.00
151 AGG NONDURABLE GOODS	.0001	.0001	.0000	.0000	.0000	.0000	.00
160 AGG DURABLE GOODS	.0000	.0000	.0000	.0000	.0000	.0000	.00
200 NEWSPAPERS	.0000	.0000	.0000	.0000	.0000	.0000	.00
272 CUT STONE AND STONE PROD	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
395 ELECTRONIC COMPONENTS, N	.0000	.0000	.0000	.0000	.0000	.0000	.00
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0001	.0001	.0000	.0000	.0000	.0000	.00
454 COMMUNICATIONS, EXCEPT R	.0001	.0001	.0000	.0000	.0001	.0001	.00
457 GAS PRODUCTION AND DISTR	.0001	.0001	.0000	.0000	.0000	.0000	.00
461 AGG WHOLESALE AND RETAIL	.0006	.0006	.0003	.0001	.0004	.0005	.03
464 AGG BANKING AND FINANCE	.0002	.0002	.0001	.0000	.0001	.0001	.00
467 AGG INSURANCE	.0000	.0000	.0000	.0000	.0000	.0000	.00
469 OWNER-OCCUPIED DWELLINGS	.0007	.0007	.0000	.0004	.0004	.0005	.00
470 REAL ESTATE	.0000	.0000	.0000	.0000	.0000	.0000	.00
471 AGG HOTELS AND EATING PL	.0003	.0003	.0001	.0000	.0001	.0001	.01
472 AGG PERSONAL SERVICES	.0001	.0001	.0000	.0000	.0001	.0001	.00
478 AGG BUSINESS SERVICES	.0000	.0000	.0000	.0000	.0000	.0000	.00
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0000	.0000	.0000	.0000	.0000	.0000	.00
503 AGG HEALTH, EDUCA. & SOC	.0002	.0002	.0001	.0000	.0001	.0001	.01
516 AGG FEDERAL GOVERN. ENTE	.0000	.0000	.0000	.0000	.0000	.0000	.00
519 AGG STATE GOV. ENTERPRISE	.0000	.0000	.0000	.0000	.0000	.0000	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0603	.0603	.0164	.0028	.0193	.0203	.58
CHANGE IN POPULATION -	2.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV-20

OPERATION & MAINT. EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
INDIRECT CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0000	.0001	.0000	.0000	.0000	.0000	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0003	.0002	.0001	.0002	.0002	.01
45 CRUSHED AND BROKEN LIMES	.0000	.0007	.0002	.0002	.0004	.0004	.01
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0002	.0001	.0000	.0001	.0001	.00
84 AGG FOOD AND KINDRED PRO	.0000	.0000	.0000	.0000	.0000	.0000	.00
151 AGG NONDURABLE GOODS	.0000	.0000	.0000	.0000	.0000	.0000	.00
160 AGG DURABLE GOODS	.0000	.0001	.0000	.0000	.0000	.0000	.00
200 NEWSPAPERS	.0000	.0000	.0000	.0000	.0000	.0000	.00
272 CUT STONE AND STONE PROD	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
395 ELECTRONIC COMPONENTS, N	.0000	.0000	.0000	.0000	.0000	.0000	.00
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0000	.0020	.0009	.0003	.0011	.0012	.04
454 COMMUNICATIONS, EXCEPT R	.0000	.0001	.0000	.0000	.0001	.0001	.00
457 GAS PRODUCTION AND DISTR	.0000	.0001	.0000	.0000	.0000	.0000	.00
461 AGG WHOLESALE AND RETAIL	.0000	.0002	.0001	.0000	.0001	.0001	.01
464 AGG BANKING AND FINANCE	.0000	.0002	.0001	.0000	.0001	.0001	.00
467 AGG INSURANCE	.0000	.0000	.0000	.0000	.0000	.0000	.00
469 OWNER-OCCUPIED DWELLINGS	.0000	.0000	.0000	.0000	.0000	.0000	.00
470 REAL ESTATE	.0000	.0001	.0000	.0000	.0000	.0000	.00
471 AGG HOTELS AND EATING PL	.0000	.0001	.0000	.0000	.0000	.0000	.00
472 AGG PERSONAL SERVICES	.0000	.0002	.0001	.0000	.0001	.0001	.01
478 AGG BUSINESS SERVICES	.0000	.0003	.0001	.0001	.0002	.0002	.01
489 ENGINEERING, ARCHITECTUR	.0000	.0005	.0003	.0001	.0004	.0004	.01
495 AGG ENTERTAINMENT	.0000	.0000	.0000	.0000	.0000	.0000	.00
503 AGG HEALTH, EDUCA. & SOC	.0000	.0000	.0000	.0000	.0000	.0000	.00
516 AGG FEDERAL GOVERN. ENTE	.0000	.0001	.0000	.0000	.0000	.0000	.00
519 AGG STATE GOV. ENTERPRISE	.0000	.0000	.0000	.0000	.0000	.0000	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0000	.0055	.0021	.0009	.0031	.0033	.12
CHANGE IN POPULATION -	0.						

Source: Micro IMPLAN, U.S. Forest Service



Table IV-21

OPERATION & MAINT. EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
INDUCED CHANGE IN STANDARD TGO-RELATED FLOWS  
(1982 DOLLARS)

SECTOR	FINAL DEMAND (MMS)	TGO (MMS)	EMPLOYEE COMP INCOME (MMS)	PROPERTY INC (MMS)	TOTAL INCOME (MMS)	VALUE ADDED (MMS)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0001	.0002	.0000	.0000	.0000	.0000	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0000	.0000	.0000	.0000	.0000	.00
45 CRUSHED AND BROKEN LIMES	.0000	.0000	.0000	.0000	.0000	.0000	.00
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0000	.0000	.0000	.0000	.0000	.0000	.00
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0001	.0000	.0000	.0000	.0000	.00
84 AGG FOOD AND KINDRED PRO	.0001	.0001	.0000	.0000	.0000	.0000	.00
151 AGG NONDURABLE GOODS	.0001	.0001	.0000	.0000	.0000	.0000	.00
160 AGG DURABLE GOODS	.0000	.0000	.0000	.0000	.0000	.0000	.00
200 NEWSPAPERS	.0000	.0000	.0000	.0000	.0000	.0000	.00
272 CUT STONE AND STONE PROD	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
395 ELECTRONIC COMPONENTS, N	.0000	.0000	.0000	.0000	.0000	.0000	.00
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0001	.0001	.0001	.0000	.0001	.0001	.00
454 COMMUNICATIONS, EXCEPT R	.0001	.0001	.0001	.0000	.0001	.0001	.00
457 GAS PRODUCTION AND DISTR	.0001	.0002	.0000	.0000	.0000	.0000	.00
461 AGG WHOLESALE AND RETAIL	.0009	.0009	.0004	.0001	.0005	.0006	.05
464 AGG BANKING AND FINANCE	.0002	.0003	.0001	.0000	.0001	.0001	.01
467 AGG INSURANCE	.0000	.0000	.0000	.0000	.0000	.0000	.00
469 OWNER-OCCUPIED DWELLINGS	.0009	.0009	.0000	.0006	.0006	.0008	.00
470 REAL ESTATE	.0000	.0001	.0000	.0000	.0000	.0000	.00
471 AGG HOTELS AND EATING PL	.0004	.0004	.0001	.0000	.0002	.0002	.01
472 AGG PERSONAL SERVICES	.0002	.0002	.0001	.0000	.0001	.0001	.00
478 AGG BUSINESS SERVICES	.0000	.0001	.0000	.0000	.0000	.0000	.00
489 ENGINEERING, ARCHITECTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
495 AGG ENTERTAINMENT	.0000	.0000	.0000	.0000	.0000	.0000	.00
503 AGG HEALTH, EDUCA. & SOC	.0003	.0003	.0001	.0000	.0002	.0002	.01
516 AGG FEDERAL GOVERN. ENTE	.0000	.0000	.0000	.0000	.0000	.0000	.00
519 AGG STATE GOV. ENTERPRISE	.0001	.0001	.0000	.0000	.0000	.0000	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0038	.0043	.0012	.0010	.0022	.0026	.11
CHANGE IN POPULATION -	0.						

Source: Micro IMPLAN, U.S. Forest Service

Table IV-22

OPERATION & MAINT. EXPENDITURES - MOOREFIELD FLOOD PROJECT (COUNTY)  
TOTAL CHANGE IN STANDARD TGO-RELATED FLOWS

(1982 DOLLARS)

SECTOR	FINAL DEMAND (MM\$)	TCO (MM\$)	EMPLOYEE COMP INCOME (MM\$)	PROPERTY INC (MM\$)	TOTAL INCOME (MM\$)	VALUE ADDED (MM\$)	EMPLOYMENT (NUMBER OF JOBS)
1 AGG AGRICULTURE	.0002	.0004	.0000	.0000	.0000	.0001	.00
26 AGRICULTURAL, FORESTRY,	.0000	.0000	.0000	.0000	.0000	.0000	.00
27 LANDSCAPE AND HORTICULTU	.0000	.0003	.0002	.0001	.0002	.0003	.01
45 CRUSHED AND BROKEN LIMES	.0000	.0008	.0002	.0002	.0004	.0004	.01
66 NEW RESIDENTIAL STRUCTUR	.0000	.0000	.0000	.0000	.0000	.0000	.00
67 NEW INDUSTRIAL AND COMME	.0000	.0000	.0000	.0000	.0000	.0000	.00
68 NEW UTILITY STRUCTURES	.0000	.0000	.0000	.0000	.0000	.0000	.00
69 NEW HIGHWAYS AND STREETS	.0575	.0575	.0157	.0021	.0178	.0186	.51
70 AGG EXCAVATION AND OTHER	.0000	.0000	.0000	.0000	.0000	.0000	.00
73 AGG MAINTENANCE AND REPA	.0000	.0003	.0001	.0000	.0002	.0002	.01
84 AGG FOOD AND KINDRED PRO	.0001	.0002	.0000	.0000	.0000	.0000	.00
151 AGG NONDURABLE GOODS	.0001	.0001	.0000	.0000	.0001	.0001	.01
160 AGG DURABLE GOODS	.0000	.0001	.0000	.0000	.0000	.0000	.00
200 NEWSPAPERS	.0000	.0001	.0000	.0000	.0000	.0000	.00
272 CUT STONE AND STONE PROD	.0000	.0000	.0000	.0000	.0000	.0000	.00
361 MACHINERY, EXCEPT ELECTR	.0000	.0000	.0000	.0000	.0000	.0000	.00
395 ELECTRONIC COMPONENTS, N	.0000	.0000	.0000	.0000	.0000	.0000	.00
423 OPTICAL INSTRUMENTS AND	.0000	.0000	.0000	.0000	.0000	.0000	.00
445 MANUFACTURING INDUSTRIES	.0000	.0000	.0000	.0000	.0000	.0000	.00
446 AGG TRANSPORT. AND WAREH	.0002	.0022	.0009	.0003	.0013	.0013	.05
454 COMMUNICATIONS, EXCEPT R	.0002	.0003	.0001	.0001	.0002	.0003	.00
457 GAS PRODUCTION AND DISTR	.0002	.0004	.0000	.0000	.0001	.0001	.00
461 AGG WHOLESALE AND RETAIL	.0015	.0017	.0008	.0002	.0010	.0012	.09
464 AGG BANKING AND FINANCE	.0004	.0006	.0002	.0001	.0004	.0004	.01
467 AGG INSURANCE	.0000	.0000	.0000	.0000	.0000	.0000	.00
469 OWNER-OCCUPIED DWELLINGS	.0016	.0016	.0000	.0010	.0010	.0013	.00
470 REAL ESTATE	.0001	.0001	.0000	.0001	.0001	.0001	.00
471 AGG HOTELS AND EATING PL	.0007	.0008	.0002	.0001	.0003	.0003	.03
472 AGG PERSONAL SERVICES	.0003	.0006	.0002	.0001	.0003	.0003	.01
478 AGG BUSINESS SERVICES	.0001	.0004	.0001	.0001	.0003	.0003	.01
489 ENGINEERING, ARCHITECTUR	.0000	.0005	.0003	.0001	.0004	.0004	.01
495 AGG ENTERTAINMENT	.0001	.0001	.0000	.0000	.0000	.0000	.00
503 AGG HEALTH, EDUCA. & SOC	.0005	.0006	.0002	.0001	.0003	.0003	.02
516 AGG FEDERAL GOVERN. ENTE	.0001	.0001	.0001	.0000	.0001	.0001	.00
519 AGG STATE GOV. ENTERPRISE	.0001	.0002	.0000	.0000	.0001	.0001	.00
525 GOVERNMENT INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.00
526 REST OF THE WORLD INDUST	.0000	.0000	.0000	.0000	.0000	.0000	.00
527 HOUSEHOLD INDUSTRY	.0000	.0000	.0000	.0000	.0000	.0000	.01
528 INVENTORY VALUATION ADJU	.0000	.0000	.0000	.0000	.0000	.0000	.00
TOTAL	.0641	.0700	.0198	.0048	.0246	.0262	.80
CHANGE IN POPULATION -	3.						

Source: Micro IMPLAN, U.S. Forest Service

## ATTACHMENT A

### AGGREGATION OF SECTORS USED IN IMPLAN MODEL

1. **AGRICULTURE** (is an aggregate of the following original sectors:
  1. DAIRY FARM PRODUCTS
  2. POULTRY AND EGGS
  3. RANCH FED CATTLE
  4. RANGE FED CATTLE
  5. CATTLE FEEDLOTS
  6. SHEEP, LAMBS AND GOATS
  7. HOGS, PIGS AND SWINE
  8. OTHER MEAT ANIMAL PRODUCTS
  9. MISCELLANEOUS LIVESTOCK
  11. FOOD GRAINS
  12. FEED GRAINS
  13. HAY AND PASTURE
  14. GRASS SEEDS
  15. TOBACCO
  16. FRUITS
  18. VEGETABLES
  20. MISCELLANEOUS CROPS
  
22. **FOREST AND GREENHOUSE PRODUCTS** (is an aggregate of the following original sectors:)
  22. FOREST PRODUCTS
  23. GREENHOUSE AND NURSERY PRODUCTS
  24. FORESTRY PRODUCTS
  
35. **ORE AND CHEMICAL MINING** (is an aggregate of the following original sectors:)
  35. METAL MINING SERVICES
  40. BITUMINOUS AND LIGNITE MINING, S
  
41. **PETROLEUM MINING** (is an aggregate of the following original sectors:)
  41. NATURAL GAS
  42. CRUDE PETROLEUM
  43. NATURAL GAS LIQUIDS
  
44. **CLAY AND STONE MINING** (is an aggregate of the following original sectors:)
  44. DIMENSION STONE
  47. CRUSHED AND BROKEN STONE, N. E.
  48. CONSTRUCTION SAND AND GRAVEL
  49. INDUSTRIAL SAND
  52. FULLER'S EARTH
  54. CLAY, CERAMIC, REFRACTORY MINERAL
  58. MISC. NONMETALLIC MINERALS, N.E.

70. EXCAVATION AND OTHER CONST. (is an aggregate of the following original sectors:)
- 70. NEW FARM STRUCTURES
  - 71. NEW MINERAL EXTRACTION FACILITIE
  - 72. NEW GOVERNMENT FACILITIES
73. MAINTENANCE AND REPAIR CONST. (is an aggregate of the following original sectors:)
- 73. MAINTENANCE AND REPAIR, RESIDENT
  - 74. MAINTENANCE AND REPAIR OTHER FACILITIES
  - 75. MAINTENANCE AND REPAIR OIL AND GAS
79. DURABLE GOODS (is an aggregate of the following original sectors:)
- 79. SMALL ARMS
  - 80. SMALL ARMS AMMUNITION
  - 81. OTHER ORDNANCE AND ACCESSORIES
  - 160. LOGGING CAMPS AND LOGGING CONTRA
  - 161. SAWMILLS AND PLANING MILLS, GENE
  - 162. HARDWOOD DIMENSION AND FLOORING
  - 163. SPECIAL PRODUCT SAWMILLS, N.E.C
  - 164. MILLWORK
  - 165. WOOD KITCHEN CABINETS
  - 166. VENEER AND PLYWOOD
  - 167. STRUCTURAL WOOD MEMBERS, N.E.C
  - 168. PREFABRICATED WOOD BUILDINGS
  - 169. WOOD PRESERVING
  - 170. WOOD PALLETS AND SKIDS
  - 172. WOOD PRODUCTS, N.E.C
  - 173. WOOD CONTAINERS
  - 280. BLAST FURNACES AND STEEL MILLS
  - 281. ELECTROMETALLURGICAL PRODUCTS
  - 282. STEEL WIRE AND RELATED PRODUCTS
  - 283. COLD FINISHING OF STEEL SHAPES
  - 284. STEEL PIPE AND TUBES
  - 285. IRON AND STEEL FOUNDRIES
  - 286. IRON AND STEEL FORGINGS
  - 287. METAL HEAT TREATING
  - 288. PRIMARY METAL PRODUCTS, N.E.C
  - 291. PRIMARY ZINC
  - 292. PRIMARY ALUMINUM
  - 294. SECONDARY NONFERROUS METALS
  - 295. COPPER ROLLING AND DRAWING
  - 296. ALUMINUM ROLLING AND DRAWING
  - 297. NONFERROUS ROLLING AND DRAWING,
  - 299. ALUMINUM CASTINGS
  - 300. BRASS, BRONZE, AND COPPER CASTIN
  - 303. METAL CANS
  - 304. METAL BARRELS, DRUMS AND PAILS
  - 315. SCREW MACHINE PRODUCTS AND BOLTS
  - 316. AUTOMOTIVE STAMPINGS
  - 317. CROWNS AND CLOSURES

79. DURABLE GOODS (continued)

- 318. METAL STAMPINGS, N.E.C.
- 330. STEAM ENGINES AND TURBINES
- 341. MACHINE TOOLS, METAL CUTTING TYPE
- 342. MACHINE TOOLS, METAL FORMING TYPE
- 343. SPECIAL DIES AND TOOLS AND ACCESSORIES
- 344. POWER DRIVEN HAND TOOLS
- 345. ROLLING MILL MACHINERY

82. FOOD AND KINDRED PRODUCTS (is an aggregate of the following original sectors:)

- 82. MEAT PACKING PLANTS
- 83. SAUSAGES AND OTHER PREPARED MEAT
- 84. POULTRY DRESSING PLANTS
- 85. POULTRY AND EGG PROCESSING
- 89. ICE CREAM AND FROZEN DESSERTS
- 90. FLUID MILK
- 93. CANNED FRUITS AND VEGETABLES
- 95. PICKLES, SAUCES, AND SALAD DRESS
- 98. FROZEN SPECIALTIES
- 99. FLOUR AND OTHER GRAIN MILL PRODUCTS
- 101. BLENDED AND PREPARED FLOUR
- 102. DOG, CAT, AND OTHER PET FOOD
- 103. PREPARED FEEDS, N.E.C
- 105. WET CORN MILLING
- 106. BREAD, CAKE, AND RELATED PRODUCT
- 109. CONFECTIONERY PRODUCTS
- 110. CHOCOLATE AND COCOA PRODUCTS
- 114. WINES, BRANDY, AND BRANDY SPIRIT
- 116. BOTTLED AND CANNED SOFT DRINKS
- 117. FLAVORING EXTRACTS AND SYRUPS, N
- 121. ANIMAL AND MARINE FATS AND OILS
- 122. ROASTED COFFEE
- 124. MANUFACTURED ICE
- 126. FOOD PREPARATIONS, N.E.C
- 128. CIGARS
- 129. CHEWING AND SMOKING TOBACCO

131. NONDURABLE GOODS (is an aggregate of the following original sectors:)

- 131. BROADWOVEN FABRIC MILLS AND FINI
- 132. NARROW FABRIC MILLS
- 135. FLOOR COVERINGS
- 139. PROCESSED TEXTILE WASTE
- 140. COATED FABRICS, NOT RUBBERIZED
- 142. CORDAGE AND TWINE
- 146. HOSIERY, N.E.C
- 147. KNIT OUTERWEAR MILLS
- 149. KNITTING MILLS, N.E.C
- 151. APPAREL MADE FROM PURCHASED MATERIAL
- 152. CURTAINS AND DRAPERIES
- 153. HOUSEFURNISHINGS, N.E.C
- 155. CANVAS PRODUCTS

131. NONDURABLE GOODS (continued)

- 157. AUTOMOTIVE AND APPAREL TRIMMINGS
- 174. WOOD HOUSEHOLD FURNITURE
- 175. HOUSEHOLD FURNITURE, N.E.C
- 176. WOOD TV AND RADIO CABINETS
- 177. UPHOLSTERED HOUSEHOLD FURNITURE
- 178. METAL HOUSEHOLD FURNITURE
- 179. MATTRESSES AND BEDSPRINGS
- 180. WOOD OFFICE FURNITURE
- 181. METAL OFFICE FURNITURE
- 182. PUBLIC BUILDING FURNITURE
- 183. WOOD PARTITIONS AND FIXTURES
- 184. METAL PARTITIONS AND FIXTURES
- 185. BLINDS, SHADES, AND DRAPERY HARD
- 186. FURNITURE AND FIXTURES, N.E.C
- 187. PULP MILLS
- 188. PAPER MILLS, EXCEPT BUILDING PAPER
- 189. PAPERBOARD MILLS
- 190. ENVELOPES
- 192. BUILDING PAPER AND BOARD MILLS
- 193. PAPER COATING AND GLAZING
- 194. BAGS, EXCEPT TEXTILE
- 197. STATIONERY PRODUCTS
- 198. CONVERTED PAPER PRODUCTS, N.E.C
- 199. PAPERBOARD CONTAINERS AND BOXES
- 215. INDUSTRIAL INORGANIC, ORGANIC CH
- 217. FERTILIZERS, MIXING ONLY
- 218. AGRICULTURAL CHEMICALS, N.E.C
- 219. GUM AND WOOD CHEMICALS
- 220. ADHESIVES AND SEALANTS
- 221. EXPLOSIVES
- 223. CARBON BLACK
- 224. CHEMICAL PREPARATIONS, N.E.C
- 225. PLASTICS MATERIALS AND RESINS
- 226. SYNTHETIC RUBBER
- 229. DRUGS
- 230. SOAP AND OTHER DETERGENTS
- 231. POLISHES AND SANITATION GOODS
- 232. SURFACE ACTIVE AGENTS
- 234. PAINTS AND ALLIED PRODUCTS
- 240. TIRES AND INNER TUBES
- 241. RUBBER AND PLASTICS FOOTWEAR
- 243. FABRICATED RUBBER PRODUCTS, N.E.
- 244. MISCELLANEOUS PLASTICS PRODUCTS
- 245. RUBBER AND PLASTICS HOSE AND BEL
- 246. LEATHER TANNING AND FINISHING
- 248. SHOES, EXCEPT RUBBER
- 253. PERSONAL LEATHER GOODS
- 254. LEATHER GOODS, N.E.C
- 255. GLASS AND GLASS PRODUCTS, EXC CO
- 256. GLASS CONTAINERS

200 PRINTING AND PUBLISHING (is an aggregate of the following original sectors:)

- 200. NEWSPAPERS
- 201. PERIODICALS
- 202. BOOK PUBLISHING
- 203. BOOK PRINTING
- 204. MISCELLANEOUS PUBLISHING
- 205. COMMERCIAL PRINTING
- 206. LITHOGRAPHIC PLATEMAKING AND SER
- 207. MANIFOLD BUSINESS FORMS
- 209. GREETING CARD PUBLISHING
- 210. ENGRAVING AND PLATE PRINTING
- 211. BOOKBINDING AND RELATED WORK
- 212. TYPESETTING

235. PETROLEUM AND ASPHALT PRODUCTS (is an aggregate of the following original sectors:)

- 235. PETROLEUM REFINING
- 236. LUBRICATING OILS AND GREASES
- 237. PETROLEUM AND COAL PRODUCTS, N.E
- 238. PAVING MIXTURES AND BLOCKS
- 239. ASPHALT FELTS AND COATINGS

257. STONE AND CLAY PRODUCTS (is an aggregate of the following original sectors:)

- 257. CEMENT, HYDRAULIC
- 258. BRICK AND STRUCTURAL CLAY TILE
- 260. CLAY REFRACTORIES
- 262. VITREOUS PLUMBING FIXTURES
- 263. VITREOUS CHINA FOOD UTENSILS
- 264. FINE EARTHENWARE FOOD UTENSILS
- 265. PORCELAIN ELECTRICAL SUPPLIES
- 266. POTTERY PRODUCTS, N.E.C
- 268. CONCRETE PRODUCTS, N.E.C
- 269. READY-MIXED CONCRETE
- 270. LIME
- 272. CUT STONE AND STONE PRODUCTS
- 273. ABRASIVE PRODUCTS
- 274. ASBESTOS PRODUCTS
- 275. GASKETS, PACKING AND SEALING DEV
- 276. MINERALS, GROUND OR TREATED
- 277. MINERAL WOOL
- 278. NONCLAY REFRACTORIES
- 279. NONMETALLIC MINERAL PRODUCTS, N.

306. HEATING AND PLUMBING PROD. (is an aggregate of the following original sectors:)

- 306. PLUMBING FIXTURE FITTINGS AND TR
- 307. HEATING EQUIPMENT, EXCEPT ELECTRICAL
- 310. FABRICATED PLATE WORK (BOILER SH

- 306. HEATING AND PLUMBING PROD. (continued)
  - 327. PIPE, VALVES, AND PIPE FITTINGS
- 308. FABRICATED METAL PRODUCTS (is an aggregate of the following original sectors:)
  - 308. FABRICATED STRUCTURAL METAL
  - 312. ARCHITECTURAL METAL WORK
  - 313. PREFABRICATED METAL BUILDINGS
  - 314. MISCELLANEOUS METAL WORK
- 309. OTHER FABRICATED METAL PROD. (is an aggregate of the following original sectors:)
  - 309. METAL DOORS, SASH, AND TRIM
  - 319. CUTLERY
  - 320. HAND AND EDGE TOOLS, N.E.C.
  - 322. HARDWARE, N.E.C.
  - 323. PLATING AND POLISHING
  - 324. METAL COATING AND ALLIED SERVICE
  - 325. MISCELLANEOUS FABRICATED WIRE PRODUCTS
  - 329. FABRICATED METAL PRODUCTS, N.E.C
- 331. MOTOR VEHICLES AND EQUIP. (is an aggregate of the following original sectors:)
  - 331. INTERNAL COMBUSTION ENGINES, N.E
  - 401. TRUCK AND BUS BODIES
  - 402. TRUCK TRAILERS
  - 403. MOTOR VEHICLES
  - 404. MOTOR VEHICLE PARTS AND ACCESSOR
- 332. FARM AND GARDEN MACHINERY (is an aggregate of the following original sectors:)
  - 332. FARM MACHINERY AND EQUIPMENT
  - 333. LAWN AND GARDEN EQUIPMENT
- 334. CONSTRUCTION MACHINERY (is an aggregate of the following original sectors:)
  - 334. CONSTRUCTION MACHINERY AND EQUIP
  - 335. MINING MACHINERY, EXCEPT OIL FIELD
  - 336. OIL FIELD MACHINERY
- 338. MATERIALS HANDLING EQUIPMENT (is an aggregate of the following original sectors:)
  - 338. CONVEYORS AND CONVEYING EQUIPMENT
  - 340. INDUSTRIAL TRUCKS AND TRACTORS



353. GENERAL INDUS. EQUIP. (is an aggregate of the following original sectors:)
- 353. PUMPS AND COMPRESSORS
  - 354. BALL AND ROLLER BEARINGS
  - 355. BLOWERS AND FANS
  - 356. INDUSTRIAL PATTERNS
  - 357. POWER TRANSMISSION EQUIPMENT
  - 359. GENERAL INDUSTRIAL MACHINERY, N.
362. OFFICE MACHINES (is an aggregate of the following original sectors:)
- 362. ELECTRONIC COMPUTING EQUIPMENT
  - 365. TYPEWRITERS AND OFFICE MACHINES,
366. SERVICE INDUSTRY MACHINES (is an aggregate of the following original sectors:)
- 366. AUTOMATIC MERCHANDISING MACHINES
  - 368. REFRIGERATION AND HEATING EQUIPMENT
  - 370. SERVICE INDUSTRY MACHINES, N.E.C
371. ELECTRICAL INDUSTRIAL EQUIP. (is an aggregate of the following original sectors:)
- 371. INSTRUMENTS TO MEASURE ELECTRICAL
  - 372. TRANSFORMERS
  - 373. SWITCHGEAR AND SWITCHBOARD APPARATUS
  - 374. MOTORS AND GENERATORS
  - 375. INDUSTRIAL CONTROLS
  - 376. WELDING APPARATUS, ELECTRIC
  - 377. CARBON AND GRAPHITE PRODUCTS
  - 378. ELECTRICAL INDUSTRIAL APPARATUS,
386. ELECTRICAL LIGHTING EQUIP. (is an aggregate of the following original sectors:)
- 386. ELECTRIC LAMPS
  - 387. LIGHTING FIXTURES AND EQUIPMENT
  - 388. WIRING DEVICES
389. COMMUNICATIONS AND EQUIP. (is an aggregate of the following original sectors:)
- 389. RADIO AND TV RECEIVING SETS
  - 390. PHONOGRAPH RECORDS AND TAPE
  - 391. TELEPHONE AND TELEGRAPH APPARATUS
  - 392. RADIO AND TV COMMUNICATION EQUIPMENT
  - 454. COMMUNICATIONS, EXCEPT RADIO AND
  - 455. RADIO AND TV BROADCASTING

393. ELECTRICAL N.E.C. (is an aggregate of the following original sectors:)
- 393. ELECTRON TUBES
  - 394. SEMICONDUCTORS AND RELATED DEVICES
  - 395. ELECTRONIC COMPONENTS, N.E.C.
  - 397. PRIMARY BATTERIES, DRY AND WET
  - 400. ELECTRICAL EQUIPMENT, N.E.C.
406. OTHER TRANSPORTATION EQUIP. (is an aggregate of the following original sectors:)
- 406. AIRCRAFT AND MISSILE ENGINES AND
  - 407. AIRCRAFT AND MISSILE EQUIPMENT,
  - 408. SHIP BUILDING AND REPAIRING
  - 410. RAILROAD EQUIPMENT
  - 412. TRAVEL TRAILERS AND CAMPERS
  - 413. MOBILE HOMES
  - 415. TRANSPORTATION EQUIPMENT, N.E.C.
416. SCIENTIFIC AND OPTICAL EQUIP. (is an aggregate of the following original sectors:)
- 416. ENGINEERING AND SCIENTIFIC INSTRUMENTS
  - 417. MECHANICAL MEASURING DEVICES
  - 418. AUTOMATIC TEMPERATURE CONTROLS
  - 419. SURGICAL AND MEDICAL INSTRUMENTS
  - 420. SURGICAL APPLIANCES AND SUPPLIES
  - 421. DENTAL EQUIPMENT AND SUPPLIES
  - 422. WATCHES, CLOCKS, AND PARTS
  - 423. OPTICAL INSTRUMENTS AND LENSES
  - 424. OPHTHALMIC GOODS
  - 425. PHOTOGRAPHIC EQUIPMENT AND SUPPLY
426. MISC. MANUFACTURING (is an aggregate of the following original sectors:)
- 426. JEWELRY, PRECIOUS METAL
  - 427. JEWELERS MATERIALS AND LAPIDARY
  - 429. COSTUME JEWELRY
  - 431. GAMES, TOYS, AND CHILDRENS VEHICLES
  - 433. SPORTING AND ATHLETIC GOODS, N.E
  - 436. MARKING DEVICES
  - 438. ARTIFICIAL TREES AND FLOWERS
  - 441. BROOMS AND BRUSHES
  - 443. BURIAL CASKETS AND VAULTS
  - 444. SIGNS AND ADVERTISING DISPLAYS
  - 445. MANUFACTURING INDUSTRIES, N.E.C.
446. TRANSPORT AND WAREHOUSEING (is an aggregate of the following original sectors:)
- 446. RAILROADS AND RELATED SERVICES
  - 447. LOCAL, INTERURBAN PASSENGER TRANSPORTATION
  - 448. MOTOR FREIGHT TRANSPORT AND WARE

- 446. TRANSPORT AND WAREHOUSEING (continued)
  - 449. WATER TRANSPORTATION
  - 450. AIR TRANSPORTATION
  - 451. PIPE LINES, EXCEPT NATURAL GAS
  - 452. TRANSPORTATION SERVICES
  - 453. ARRANGEMENT OF PASSENGER TRANSPORTATION
  
- 456. UTILITIES (is an aggregate of the following original sectors:)
  - 456. ELECTRIC SERVICES
  - 457. GAS PRODUCTION AND DISTRIBUTION
  - 458. WATER SUPPLY AND SEWERAGE SYSTEM
  - 459. SANITARY SERVICES AND STEAM SUPPLY
  
- 460. WHOLESALE AND RETAIL TRADE (is an aggregate of the following original sectors:)
  - 460. RECREATIONAL RELATED WHOLESALE TRADE
  - 461. OTHER WHOLESALE TRADE
  - 462. RECREATIONAL RELATED RETAIL TRADE
  - 463. OTHER RETAIL TRADE
  
- 464. BANKING AND FINANCE (is an aggregate of the following original sectors:)
  - 464. BANKING
  - 465. CREDIT AGENCIES
  - 466. SECURITY AND COMMODITY BROKERS
  
- 467. INSURANCE (is an aggregate of the following original sectors:)
  - 467. INSURANCE CARRIERS
  - 468 INSURANCE AGENTS AND BROKERS
  
- 471. HOTELS AND EATING PLACES (is an aggregate of the following original sectors:)
  - 471. HOTELS AND LODGING PLACES
  - 491. EATING AND DRINKING PLACES
  
- 472. PERSONAL SERVICES (is an aggregate of the following original sectors:)
  - 472. LAUNDRY, CLEANING AND SHOE REPAIR
  - 473. FUNERAL SERVICE AND CREMATORIES
  - 474. PORTRAIT AND PHOTOGRAPHIC STUDIO
  - 475. ELECTRICAL REPAIR SERVICES
  - 476. WATCH, CLOCK, JEWELRY AND FURNITURE
  - 477. BEAUTY AND BARBER SHOPS
  - 492. AUTOMOBILE RENTAL AND LEASING
  - 493. AUTOMOBILE REPAIR AND SERVICES
  - 494. AUTOMOBILE PARKING AND CAR WASH

478. BUSINESS SERVICES (is an aggregate of the following original sectors:)

- 478. MISCELLANEOUS REPAIR SHOPS
- 479. SERVICES TO BUILDINGS
- 480. PERSONNEL SUPPLY SERVICES
- 481. COMPUTER AND DATA PROCESSING SERVICES
- 482. MANAGEMENT AND CONSULTING SERVICE
- 483. DETECTIVE AND PROTECTIVE SERVICE
- 484. EQUIPMENT REPAIR AND LEASING
- 485. PHOTOFINISHING, COMMERCIAL PHOTO
- 486. OTHER BUSINESS SERVICES
- 487. ADVERTISING
- 488. LEGAL SERVICES
- 490. ACCOUNTING, AUDITING AND BOOKKEEPING

495. ENTERTAINMENT (is an aggregate of the following original sectors:)

- 495. MOTION PICTURES
- 496. DANCE HALLS, STUDIOS AND SCHOOLS
- 497. THEATRICAL PRODUCERS, BANDS ETC.
- 498. BOWLING ALLEYS AND POOL HALLS
- 499. COMMERCIAL SPORTS EXCEPT RACING
- 500. RACING AND TRACK OPERATION
- 501. MEMBERSHIP SPORTS AND RECREATION
- 502. AMUSEMENT AND RECREATION SERVICE

503. HEALTH, EDUCA. & SOC. SERVICE (is an aggregate of the following original sectors:)

- 503. DOCTORS AND DENTISTS
- 504. HOSPITALS
- 505. NURSING AND PROTECTIVE CARE
- 506. OTHER MEDICAL AND HEALTH SERVICE
- 507. ELEMENTARY AND SECONDARY SCHOOLS
- 508. COLLEGES, UNIVERSITIES, SCHOOLS
- 509. OTHER EDUCATIONAL SERVICES
- 510. BUSINESS ASSOCIATIONS
- 511. LABOR AND CIVIC ORGANIZATIONS
- 512. RELIGIOUS ORGANIZATIONS
- 513. OTHER NONPROFIT ORGANIZATIONS
- 514. RESIDENTIAL CARE
- 515. SOCIAL SERVICES, N.E.C.

516. FEDERAL GOVERN. ENTERPRISES (is an aggregate of the following original sectors:)

- 516. U.S. POSTAL SERVICE
- 518. OTHER FEDERAL GOVERNMENT ENTERPRISE

519. STATE GOV. ENTERPRISES (is an aggregate of the following original sectors:)

- 519. LOCAL GOVERNMENT PASSENGER TRANS
- 520. STATE AND LOCAL ELECTRIC UTILITIES
- 521. OTHER STATE AND LOCAL GOVT ENTERPRISES

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