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# Operations Plan for Comprehensive Development

## The Arkansas-Verdigris Waterway in the Ozarks Regional Commission Area



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DECEMBER 1969

IWR REPORT 69-2



**DEPARTMENT OF THE ARMY**  
**OFFICE OF THE CHIEF OF ENGINEERS**  
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29 December 1969

Mr. E. L. Stewart, Jr.  
Federal Co-Chairman  
The Ozarks Regional Commission  
Room 2099, Main Commerce Building  
14th and E Streets, N. W.  
Washington, D. C. 20230

Dear Mr. Stewart:

Transmitted herewith is the report prepared in accordance with the Memorandum of Agreement between the Ozarks Regional Commission and the Corps of Engineers regarding the formulation of a plan of study to determine optimum economic development within the Arkansas River Valley.

This study, entitled "Operations Plan for Comprehensive Development; the Arkansas-Verdigris Waterway in the Ozarks Regional Commission Area," represents the final product of the subject contract.

The Corps fully endorses the objective of the Commission in seeking the maximum benefits from the federal waterway, and is pleased to have had the opportunity to serve the Commission in the preparation of this plan.

Sincerely yours,

R. H. GROVES  
Brigadier General, USA  
Deputy Director of Civil Works

## FOREWORD

This report is the product of research undertaken as a result of a Memorandum of Agreement between the Ozarks Regional Commission and the Corps of Engineers regarding the Formulation of a Plan of Study to Determine Optimum Economic Development Within the Arkansas River Valley.

The work was performed by a special Task Force of the Corps, and coordinated during its development with representatives of the Ozarks Regional Commission at several meetings held in Washington.

Field members of the Task Force were: Ivan L. Hobson, Field Coordinator, Southwestern Division; David L. Burrough, Little Rock District, Southwestern Division; John A. Sparlin and Richard Roller, Tulsa District, Southwestern Division.

In addition, valuable consultation and assistance was furnished by the following: Irwin Reisler, Robert M. Gidez, and William J. Donovan, Office of the Chief of Engineers; Nathaniel A. Back and Walter B. Schilling, Institute for Water Resources; James J. Tozzi, Systems Analysis Group (Civil Functions), Office of the Secretary of the Army; and Edgar W. Landenberger, Consultant.

BURNHAM H. DODGE  
Task Force Chairman  
Director, Center for Advanced  
Planning  
Institute for Water Resources  
Alexandria, Virginia

OPERATIONS PLAN  
FOR  
COMPREHENSIVE DEVELOPMENT

THE ARKANSAS-VERDIGRIS WATERWAY  
IN THE  
OZARKS REGIONAL COMMISSION AREA

Prepared by the Corps of Engineers  
As Provided in the  
Memorandum of Agreement Between the Ozarks Regional  
Commission and the Corps of Engineers

December 1969

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## SUMMARY

An action program for stimulating and accelerating the economic development in the Ozarks Regional Commission area is underway. The successful implementation of the program can result in the closure of the "income gap" between the Commission area and the Nation. Increased income will permit the residents to enjoy a standard of living equal to that enjoyed by the "average" U. S. citizen. In addition, the viable economy will provide a base for improving governmental services for the citizens of the area, while providing a valuable input for the Nation.

As part of the task of developing a comprehensive plan for the Commission area, the Commission in March 1969 signed an agreement (Appendix A) with the U. S. Army Corps of Engineers to undertake the formulation of an Operations Plan for the Arkansas River Valley. The Plan identifies a program of studies, the results of which will provide for orderly and optimum economic development within the Valley, with particular emphasis on those lands adjacent to the Arkansas-Verdigris Waterway.

The Waterway is a natural and logical choice for such a concentrated planning effort in view of the Federal investment of approximately \$1.25 billion in the engineering works necessary to make the Waterway from the Mississippi River to near Tulsa-Catoosa, Oklahoma navigable the year round.

For an area that has lagged in economic growth, the Federal investment in the future has created a resource which can serve as the basis for self-sustaining growth and development.

This Operations Plan identifies the studies needed to formulate a realistic Development Plan for the Waterway area. Some of the information identified is already available but not all in a usable form in its present state, and some must be developed during the planning effort. In order to keep costs to a minimum, available data will be utilized whenever possible. Pertinent factors, whether they be economic, social, political, or environmental, will be evaluated.

The Development Plan will help guide and stimulate future investments by governmental and nongovernmental groups not only by identifying where investments in human and natural resources are needed, but also identifying potential industrial, commercial, and residential sites to completely utilize the resources of the Waterway area. The implementation of the Development Plan will enable the Waterway area and the Nation to realize the economic and social potential created by improving the Arkansas River for navigation.

More specifically, the Development Plan intended to result from carrying out the Operations Plan described herein would consist, under administration by a centralized management arrangement, of a set of coordinated and functionally related programs. The principal programs in the set would concern the following areas:

1. Land Use - The identification, classification and zoning of land for best industrial, commercial, residential, recreational and other uses.
2. Site Selection - The optimum matching of sites to uses and users.
3. Investments - A time-phased program of public and private capital investment.

4. Education - A program for development of management and labor skills and necessary associated teaching skills.

5. Transportation - The planned interrelation and systemization of water, road, rail and air facilities.

6. Taxes - Achieving an expanded tax base and increased tax revenue to finance improved governmental services.

7. Environment - Preservation and enhancement of the environment and amenities necessary for the well-being of the people and the attraction of external resources.

8. Legislation - The clearing away of obstacles and creation of incentives to support the programs in the Development plan.

The Operations Plan is divided into five sections which are entitled: Phase 0, Administration; Phase 1, Inventory, Phase 2, Analysis; Phase 3, Selection of the Development Plan; and Phase 4, Continuing Implementation. A description of these phases appears at the beginning of each Phase and is also repeated below. A summary workflow sequence diagram is furnished as Appendix B.

Phase 0, Administration, identifies the actions needed to provide for the overall supervision and coordination of those activities that will be associated with the conduct of the studies necessary to formulate the development plan. It also provides for the development of a public information program which will result in a continuing exchange of information, ideas, and opinions that will foster understanding and involvement of interested persons in the planning effort.

In Phase 1, Inventory, information which has or could have an effect on the future of the Waterway area will be assembled. The Commission has produced a bibliography of development studies in the area which should be utilized extensively in order to shorten the research time and to ascertain the data which have already been developed. The data inventory is to include laws, regulations, reports, and policy statements

that concern or affect economic development in the Waterway area and related planning efforts in other areas. Phase 1 studies provide for the compilation of population and income profiles of the Waterway area. In many instances, these data have already been developed. Inventories of natural, human, and capital resources and public facilities, which include transportation, educational, and health facilities, will utilize available data whenever possible. The environmental characteristics of the area will be considered, and maps of the area will be assembled. In addition, Phase 1 provides for the examination of lands adjoining the Waterway with a view to identifying possible industrial, commercial, and urban sites. The recently completed industrial site studies in Arkansas and Oklahoma will be utilized. The information developed in Phase 1 will provide necessary input data for Phase 2, Analysis.

Phase 2 provides for the analysis of data collected in Phase 1. Studies of industries and markets will be made to determine what industries might locate along or near the Waterway to use available and developable resources, and what markets could be served by industries located along or near the Waterway. The sites identified in Phase 1 will be studied to determine their alternative uses. Potential environmental effects of alternative developments will be examined. The study information assembled on public facilities will be analyzed to determine what additional facilities are required to fully utilize identified sites. The results of the various analytical studies will provide essential input information for use in formulating a comprehensive plan for the Waterway area.

In Phase 3, Selection of the Development Plan, alternative development policies such as increasing income, tax base, employment, and the maintenance and enhancement of environmental quality will be formulated and the nature and extent of their policy conflicts will be identified. Methodologies to measure the economic benefits of the alternative policies will be developed. With these methodologies, alternative program and project mixes will be formulated and their economic benefits will be determined. Projects and programs to be included in the development plan will be selected. In addition, during this phase alternative means of directing the implementation of the development plan will be examined, and an organizational structure and institutional arrangement for directing the implementation will be identified.

In Phase 4, Continuing Implementation, there are provisions for continuing implementation of the development plan. Procedures to periodically update the development plan, to report progress on its implementation, and to review its accomplishments will be determined. Over a long period of time, considerable economic growth and development can be expected in the Waterway area. Continuing implementation is essential if the plan is to be fully responsive to the needs and potentials of the Waterway area.

In view of the magnitude of the job to be accomplished, it is essential that all planning efforts be closely coordinated. The Operations Plan accomplishes this objective through coordinated, central management of planning and development of the Waterway area. Instead of a multiplicity of plans for individual segments, such as a water plan, a transportation plan, or an educational plan, one plan which has fully

considered all the interrelations would be developed. This plan may be used by Federal, state and local governments and by nongovernmental interests in planning their future investments.

The successful implementation of the development plan is expected to stimulate and guide economic development that can bring the people of the Arkansas-Verdigris Waterway area back into the economic mainstream of the United States in the shortest practicable time.

PHASE 0  
ADMINISTRATION

This phase identifies the actions needed to provide for the overall supervision and coordination of those activities that will be associated with the conduct of the studies necessary to formulate the development plan. It also provides for the development of a public information program which will result in a continuing exchange of information, ideas, and opinions that will foster understanding and involvement of interested persons in the planning effort.

## 0100 ADMINISTRATIVE FACILITIES

Purpose: To provide for overall supervision, administration, and management of this study.

The administrative organization for the conduct of this study must be established. It must be adequate for the direction and coordination of the studies necessary for the selection of the development plan.

### Work elements:

0101 Selection of personnel to administer and coordinate the conduct of this study

0102 Provide for continuing coordination, communication, and direction of study

.1 Select and monitor contracts and contractors

.2 Furnish study results to ORC

.3 Public information activities

0103 Provide for administration activities

.1 Finances

.2 Location

.3 Personnel

End product: The establishment of the organizational entity responsible for overall supervision and coordination of all study activities.

0200 PUBLIC INFORMATION PROGRAM

Purpose: To effect a continuing exchange of information, ideas, and opinions that will foster understanding and involvement of both the governmental and nongovernmental sectors.

Method: Record and present significant findings and recommendations of studies and of development activity in a form suitable for wide technical use and review.

0201 Prepare public information program that creates

- .1 Initial awareness
- .2 On-going awareness
- .3 Public opinion awareness
- .4 Accomplishment awareness
- .5 Impact awareness

0202 Select media, consider

- .1 Objectives
- .2 Funds
- .3 "Target" portions of general public
  - .31 Population density
  - .32 Potential impact in area
  - .33 Need in area
  - .34 Area attitudes
  - .35 Influence of the area on other areas

0203 Implementation of program

End product: A continuing public information program which will keep the public abreast of emerging and proposed development activity.

PHASE 1  
INVENTORY

Pertinent information which has or could have an effect on the future of the Waterway area will be assembled in Phase 1 by inventory studies. The Commission has produced a bibliography of development studies in the area which should be utilized extensively in order to shorten the research time and to ascertain the data which have already been developed. The data inventory is to include laws, regulations, reports, and policy statements that concern or affect economic development in the Waterway area and related planning efforts in other areas. Phase 1 studies provide for the compilation of population and income profiles of the Waterway area. In some instances, these data have already been developed by the Commission. Inventories of natural, human, and capital resources and public facilities, which include transportation, educational, and health facilities, will utilize available data whenever possible. The environmental characteristics of the area will be considered and maps of the area will be assembled. In addition, Phase 1 provides for the examination of lands adjoining the Waterway with a view to identifying possible industrial, commercial, and urban sites. The recently completed industrial studies in Arkansas and Oklahoma will be utilized. The information developed in Phase 1 will provide necessary input data for Phase 2, Analysis.

## 1000 POLICY INVENTORY

Purpose: To document the basic content of pertinent publications, reports, statements, actions, and trends in economic development policy in the area under consideration and in other selected areas. Accomplishment of this inventory is significant in identifying relevant studies and related information concerning economic development in the Waterway area.

Method: Review pertinent available references.

### Work elements:

#### 1001 Review of ORC actions

- .1 Publications
- .2 Resolutions

#### 1002 County, cities and towns policy and actions

- .1 Publications
- .2 Ordinances
- .3 Resolutions

#### 1003 Regional agencies' policies and actions

- .1 Economic Development Districts
- .2 Resource Conservation and Development Projects
- .3 Port authorities
- .4 Councils of Government
- .5 Ozarks Regional Commission
- .6 Four Corners Regional Commission
- .7 Upper Great Lakes Regional Commission
- .8 New England Regional Commission
- .9 Appalachia Regional Commission

- .10 Coastal Plains Regional Commission
- .11 Alaska Federal Field Committee For Development Planning
- .12 Other
- 1004 State agencies' laws and policy statements
  - .1 State statutes
  - .2 Governor's policy statements
  - .3 Oklahoma Department of Parks and Industrial Development
  - .4 Arkansas Planning Commission
  - .5 Other State agencies' publications and resolutions
- 1005 Appropriate Federal laws, regulations and policy statements
  - .1 Laws and regulations
  - .2 Policy statements
    - .21 President
    - .22 Cabinet
    - .23 Congress
    - .24 Councils

End product: Document all pertinent findings in a form suitable for review and analysis as discussed in work element 2000, Policy Evaluation.

## 1100 POPULATION AND INCOME DATA INVENTORY

Purpose: Obtain historical and current data on population and income characteristics. Population and income data provide the basis for comparison of the status of the Waterway area relative to other regions and of the nation.

Method: Historical and current data will be obtained from available sources including the U. S. Bureau of the Census, U. S. Office of Business Economics, State colleges and Universities, Arkansas Employment Security Division, and Oklahoma Employment Security Commission.

### Work elements:

1101 For each geographic unit, collect and/or develop the following data

- .1 Urban/rural population by age, sex, and race
- .2 Urban/rural population by occupation
- .3 Population by years of schooling completed
- .4 School census enrollment
- .5 Total, household, median, and per capita income
- .6 Labor force participation by age, sex, and race
- .7 Employment
- .8 Unemployment
- .9 Underemployment
- .10 Net migration
- .11 Distribution and type of labor force skills

End product: Data should be displayed such that significant variables and combinations of variables are readily identified and amendable to analysis. This data provides necessary input for work element 2100, Population and Income analysis.

## 1200 INVENTORY NATURAL, HUMAN, COMMUNITY, AND CAPITAL RESOURCES

Purpose: To inventory the quantity and quality of resources available in the Waterway area. This inventory data will be used in the analysis of sites and in the selection of projects and programs to be included in the development plan.

Method: Data will be obtained from U. S. Census, Department of Agriculture, and other government and nongovernmental sources.

### Work elements:

#### 1201 Inventory of natural resources

- .1 Minerals and fuels
  - .11 Estimated Reserves
  - .12 Recoverable reserves
- .2 Water
  - .21 Quality
  - .22 Quantity
- .3 Agricultural resources
  - .31 Acreage
  - .32 Climate
  - .33 Soil fertility to include capability
  - .34 Terrain
  - .35 General ecology
  - .36 Land availability
- .4 Forestry

- .41 Acreage
- .42 Timber stock, cut, and available growth
  - .421 Species
  - .422 Quality
  - .423 Quantity
- .43 Distribution
- .44 Institutional factors
  - .441 Conservation
  - .442 Management
- .5 Recreation resources (see work element 1500)
  - .51 Lakes, rivers, and creeks
  - .52 Forests
  - .53 Caves
  - .54 Mountains
  - .55 Historical sites
  - .56 Archeological remains
  - .57 Wildlife
- 1202 Human resources (see work element 1100)
- 1203 Capital
  - .1 Personal income and savings
  - .2 Income distribution
  - .3 Value and age of private sector production assets  
(plant and equipment)
  - .4 Investment capital availability
    - .41 Wealth
    - .42 Financial and banking facilities
    - .43 Attitudes of potential investors
    - .44 Attitudes of communities

1204 Community criteria (see work element 1700)

- .1 Community attitudes toward industries
- .2 Housing
- .3 Schools and churches
- .4 Residents' attitude toward community
- .5 Recreation facilities

End product: A working paper displaying all relevant data in tables. The tables will be designed to identify all significant variables and combinations of variables such that the data are readily adaptable to economic analysis. The working paper will be used to provide input data for work element 2200 Industry Studies.

## 1300 INFRASTRUCTURE INVENTORY

Purpose: Economic development in an area is partially dependent on available infrastructure. Infrastructure which includes transportation, communication, utility, education and health facilities when analyzed in Phase 2 will show existing deficiencies that retards economic development.

Method: Examine maps and related materials obtained under work elements 1100 Population and Income Data Inventory; 1200 Inventory Natural, Human, Community, and Capital Resources; and 1800 Cartography; and supplement with information acquired from local, state and public institutions, the private sector, and individuals.

### Work element:

1301 Relate to work elements 1100, 1200, and 1800

1302 Transportation networks

.1 Roads

.2 Waterways

.3 Railways

.4 Airways

.5 Pipelines

1303 Communication network

.1 Radio, television

.2 Newspapers, periodicals

.3 Telephone, telegraph

.4 Other

1304 Utility networks

.1 Electric power

- .2 Gas lines
- .3 Water supply
- 1305 Education facilities, location, quality and quantity
  - .1 Vocational and technical
  - .2 Primary and secondary
  - .3 Higher education
- 1306 Health facilities
  - .1 Quantity
  - .2 Location
  - .3 Quality

End product: A working paper identifying infrastructure of the Waterway area. The inventorial data provides necessary input data for work elements 2200 Industry Studies; 2400 Sites Analysis; 2500 Legal and Institutional Considerations; and 2600 Infrastructure Evaluation.

## 1400 ECONOMIC GROWTH AND AREA DEVELOPMENT MODELS INVENTORY

Purpose: To search the literature for available operational models which deal with economic growth and area development to more fully understand the possible ways of modeling and to eliminate costly duplications.

Method: The function of the models is to provide a better understanding of how the economy operates, the interrelationships of the various elements, and how a change in one will affect others. The planning literature will be researched for available operation models. Where possible, detailed documentation of the models will be obtained so that it may be properly evaluated.

### Work elements:

#### 1401 Literature research and documentation of models

- .1 Computers (including program simulations and systems analysis)
  - .11 Economics: regional economics, economic demography, water resources, econometrics, and location theory
  - .12 Hydrology: water flow, pollution, and water uses
  - .13 Data collection, evaluation, and analysis
- .2 Interregional studies
  - .21 Commodity and money flows
  - .22 Balance of payment studies
  - .23 Location quotient

End product: Prepare synopsis of major models for evaluation and analysis under work element 2700 Review and Critique of Available Models.

## 1500 ENVIRONMENTAL CHARACTERISTICS AND VALUES INVENTORY

Purpose: To inventory the environmental characteristics and values that should be considered in planning for the economic development of the Waterway area. These data vitally affect the composition of the development plan.

Method: Search literature to identify pertinent reports, studies, books and other related data. Field research may also be required to supplement available information.

### Work elements:

1501 Relate to work elements 1100, 1200, 1300, and 1700

1502 Environmental characteristics and values

- .1 Land
- .2 Water (including pollution load capability)
- .3 Air
- .4 Conservation and Scenic Values
- .5 Population concentration

1503 Climatology

- .1 Precipitation characteristics
- .2 Evaporation characteristics
- .3 Temperature characteristics

1504 Plant associations

- .1 Forestry
- .2 Agriculture
- .3 Other

1505 Fish and wildlife

.1 Quantity

.2 Quality

.3 Issues and problems

1506 Attractions of national, regional, or local significance

.1 Natural scenic areas

.2 Scientific

.3 Geologic

.4 Parks and recreation areas

.5 Wilderness areas

.6 Wild rivers

End product: A working paper summarizing the environmental characteristics and values to be considered in the formulation of the comprehensive development plan. The working paper provides necessary input data for work element 2300 Environmental Characteristics and Values Analysis.

## 1600 SURVEY OF RELATED PLANNING ACTIVITIES

Purpose: To determine what planning has been accomplished or is underway which is of an economic development nature, and to identify cause and effect relationships in economic progress and/or development. Review historical plans, policies, and projects related to the economic development of the area adjacent to the Waterway.

Method: A survey will be made of the plans, projects, and activities related to the economic development of the Waterway area (whether they result from governmental or nongovernmental activity). Documentation will include major reports and other similar information which point to possible causes and/or effects of economic development.

Work elements:

- 1601 Relate to work elements 1000 and 1300
- 1602 Inventory of plans and related activities
- 1603 Major economic developments inventory
- 1604 Inventory of other documents

End product: Information developed in this review will provide additional insight into those factors and activities which contribute effectively to economic development. The information will provide input data for work element 2000 Policy Evaluation.

## 1700 SITES INVENTORY

Purpose: To develop criteria for use in inventorying waterway sites.

The use of these criteria will identify the industrial, commercial, and residential development potential of sites adjacent to the Waterway.

Method: Location and planning literature will be reviewed for criteria.

The application of the criteria in Phase 2 will identify the type of development activity for which Waterway sites and areas are most suitable.

### Work elements:

- . 1701 Relate to work element 1500
- . 1702 Physical criteria
  - .1 Flood potential
  - .2 Land slope
  - .3 Size of site
    - .31 1 to 200 acres
    - .32 201 to 1,000 acres
    - .33 1,001 and over
  - .4 Load bearing conditions
    - .41 Regional geology
    - .42 Soils
    - .43 Mineral resources
    - .44 Ground water
  - .5 Availability of water (see work element 1200)
    - .51 Inventory present developments, uses, rights, etc.
    - .52 Review existing reports and studies

- .53 Determine quantity and quality of water available
- .6 Availability of reservoir sites
- .7 Potential problems
  - .71 Ground water encroachment
  - .72 Strip pits and land fill
- .8 Aesthetic considerations
- 1703 Economic criteria (see work element 1300)
  - .1 Distribution system
    - .11 Railways
    - .12 Highways
    - .13 Airways
    - .14 Waterways
    - .15 Pipelines
  - .2 Power sources
  - .3 Proximity of raw materials
  - .4 Available markets
  - .5 Availability of labor (see work element 1100)
  - .6 Labor costs
  - .7 Tax structures
- 1704 Land use inventory (see work element 1800)

End product: A working paper which identifies development potential of waterway sites and areas. This paper draws heavily on information developed in other studies as indicated above and cannot be completed prior to completion of the other studies. The working paper provides necessary input data for work elements 2200 Industry Studies; 2300 Environmental Characteristics and Values Analysis; 2400 Sites Analysis; and 2600 Infrastructure Evaluation.

## 1800 CARTOGRAPHY

Purpose: To assemble maps and aerial photographs to provide the basis for the compilation, synthesis, analysis, and interpretation of information.

Method: Available maps which could be used in the studies should be collected. These should be supplemented where necessary by additional maps to be compiled by consultants or Government agencies. Choice of type of map (planimetric, topographic, base maps, etc) should be guided by type of information desired and the potential use of the map(s).

### Work elements:

#### 1801 Assemble available maps

- .1 Urban centers
- .2 Agriculture
  - .21 Terrain
  - .22 Soils
  - .23 Crops
  - .24 Forest resources
- .3 Transportation, communication, and utilities
- .4 Water supply and waste disposal
- .5 Mineral resources
- .6 Recreation suitability

#### 1802 Arrange for compilation of maps not otherwise available

#### 1803 Prepare maps from selected area data

- .1 Per capita income levels
- .2 Family income levels

- .3 Retail and wholesale activity levels
- .4. Houses owned or rented
- .5 Manufacturing activity
- .6 Population density
- .7 Commercial activity
- .8 Recreation facilities and activity
- .9 Other

End product: The maps will provide necessary input for Phase 2, Analysis, Phase 3, Implementation of Development Plan; and Phase 4, Continuing Implementation.

PHASE 2  
ANALYSIS

Phase 2 provides for the analysis of data collected in Phase 1. Studies of industries and markets will be made to determine what industries might locate along or near the Waterway to use available and developable resources, and what markets could be served by industries located along or near the Waterway. The sites identified in Phase 1 will be studied to determine their alternative uses. Potential environmental effects of alternative developments will be examined. The study information assembled on public facilities will be analyzed to determine what additional facilities are required to fully utilize identified sites. The results of the various analytical studies will provide essential input information for use in formulating a comprehensive development plan for the Waterway area.

## 2000 POLICY EVALUATION

Purpose: To evaluate development policy to determine which policies might be appropriate in formulating the development plan for the Waterway area. The resources of the other areas should be compared with the resources of the Waterway area to ascertain the applicability of their policies to economic development in the Waterway area.

Method: Development policies identified in the inventory phase should be classified and evaluated. Goals implied by these policies should be specified. Local, State, and national policies should be compared and analyzed in light of existing and emerging issues and problems in the Waterway area.

### Work elements:

- 2001 Relate to work elements 1000 and 1600
- 2002 Classify policies
- 2003 Evaluate policies
- 2004 Compare policies and identify goals
  - .1 Ozarks Regional Commission
  - .2 Local
  - .3 State
  - .4 National
  - .5 Other
- 2005 Analysis of policies and goals
  - .1 Conflicting and/or compatible policies
  - .2 Conflicting and/or compatible goals
  - .3 Historical effectiveness in meeting goals

.4 Deterrents to development

.5 Aids to development

End product: A working paper containing the inventory, evaluation, and analysis of policies which will provide input to work elements 3000

Formulate Development Policy Alternatives; 3100 Measure Policy Contribution to Development; 3200 Selection of Development Plan; and 3300 Plan Implementation.

## 2100 POPULATION AND INCOME ANALYSIS

Purpose: Analyze historical and current population and income data to ascertain the status of the Waterway area relative to other regions and the Nation, and identify significant issues, problems, and trends.

Method: The analysis will be developed from the population and income inventory.

### Work elements:

2101 Relate to work element 1100

2102 Area population profile and trends

- .1 Size
- .2 Characteristics (age, sex, race, distribution)
- .3 Migration
- .4 Implications for industrial development
  - .41 Labor force
  - .42 Employment
  - .43 Unemployment
  - .44 Present education levels and trend
  - .45 Present skill levels and trends
  - .46 Underemployment
  - .47 Potential labor force (skilled and unskilled)

2103 Income distribution

- .1 Per capita
- .2 Household
- .3 Income gap

.31 Intraregional

.32 Interregional

End product: A working paper containing the data collected in 1100 including the results of this evaluation and analysis. The paper provides input data for work element 3200 Selection of Development Plan.

## 2200 INDUSTRY STUDIES

Purpose: To identify industry location requirements and relate them to the site inventory.

Method: Industries will be surveyed to identify and characterize the significant factors influencing the location of industrial activities. These factors will be related to the inventoried sites in order to determine location fit.

### Work elements:

2201 Relate to work element 1700

2202 Industry studies

- .1 Primary metal industries
- .2 Chemicals and allied products
- .3 Paper and allied products
- .4 Food and kindred products
- .5 Stone, clay, and glass products
- .6 Transportation equipment
- .7 Lumber and wood products
- .8 Furniture and fixtures
- .9 Rubber and plastic products
- .10 Fabricated metal products
- .11 Machinery, except electrical
- .12 Electrical machinery, equipment, and supplies
- .13 Ordinance and accessories

- .14 Apparel
  - .15 Textiles
  - .16 Printing and publishing
  - .17 Petroleum and coal
  - .18 Leather and leather products
  - .19 Instruments and related products
  - .20 Other
- 2203 Relate industry location factors to sites
- .1 Access to markets (demand)
  - .2 Labor availability
  - .3 Access to support materials (supply)
  - .4 Transportation
  - .5 Fuel and power
  - .6 Water supply and quality
  - .7 Climate
  - .8 Community attitudes
  - .9 Taxes
  - .10 National security requirements
  - .11 Other

End product: A report identifying location fit between industries and sites. Report information will be incorporated into a land use plan in work element 2400 Sites Analysis.

## 2300 ENVIRONMENTAL CHARACTERISTICS AND VALUES ANALYSIS

Purpose: To appraise and evaluate the degree to which selected environmental characteristics and values affect economic development. Alternative site developments will be weighed to ascertain the beneficial, complementary, and adverse effects that development is likely to have on pollution, site aesthetics, and adjacent lands. An appraisal will be made of unique environmental characteristics of those lands that may be preserved. Consideration will be given to "nondevelopment" (preservation).

Method: Integrate the data obtained in work elements 1500 Environmental Characteristics and Values; 1700 Sites Inventory; and 2200 Industry Studies.

Work elements:

2301 Integrate data obtained in work elements 1500, 1700, and 2200

2302 Develop compatible land, water, and air use concepts and identify and discuss noncompatible uses.

End product: A working paper which evaluates development proposals that have the highest degree of compatibility consistent with identified environmental characteristics and values in the Waterway area. This working paper will be used as input for work elements 2400 Sites Analysis; 2500 Legal and Institutional Considerations; 3000 Formulate Development Policy Alternatives; 3100 Measure Policy Contribution to Development; and 3200 Selection of Development Plan.

## 2400 SITES ANALYSIS

Purpose: To evaluate potential uses of sites and to prepare a land use plan.

Method: The information obtained in work elements 1700 Sites Inventory; 2200 Industry Studies; and 2300 Environmental Characteristics and Values Analysis will be analyzed. Criteria for determining site suitability for alternative uses will be applied to develop a land use plan.

### Work elements:

2401 Relate to work elements 1700, 2200, and 2300

2402 Establish criteria for site suitability

2403 Urban sites

2404 Commercial sites

.1 Land oriented

.2 Water oriented

2405 Industrial sites

2406 Mining sites

.1 Land oriented

.2 Water oriented

2407 Recreation sites

.1 Land oriented

.2 Water oriented

2408 Agriculture

2409 Historical

2410 Other

End product: A working paper which identifies sites suitable for specific uses and presents a land use plan with recommendations for specific feasibility studies. The working paper will be used as input for work elements 2600 Infrastructure Evaluation; 3000 Formulate Development Policy Alternatives; 3100 Measure Policy Contribution to Development; and 3200 Selection of Development Plan.

## 2500 LEGAL AND INSTITUTIONAL CONSIDERATIONS

Purpose: To identify and evaluate the legal and institutional framework within which the plan will be developed and implemented.

Method: Explore and analyze pertinent problems to determine their applicability to the implementation of a development plan in the Waterway area. Communicate with representative officials of the various governmental levels to ascertain the various types of legal, institutional, and political contributions and/or constraints to the economic development of the Waterway area.

### Work elements:

2501 Relate to Phase 1 and work element 2300

2502 Explore and analyze the following problem areas to determine their applicability to the Waterway area

- .1 Regional (interstate and intrastate) problems in land use regulation
- .2 Local financial problems
- .3 Technical and procedural problems
- .4 New techniques in land use regulation
- .5 Existing land use patterns
- .6 Zoning
- .7 Regulatory controls
- .8 Implications of water quality standards
- .9 Implications of air pollution standards
- .10 Advisory authorities

- .11 Other activities subject to Federal, state, or local permits or standards.

2503 City, County, State, and Federal influences

- .1 Land use regulation
- .2 Financial
- .3 Water quality standards
- .4 Air pollution standards
- .5 Health standards
- .6 General attitudes
- .7 Other influences

End product: A working paper identifying the legal, institutional, and political framework that will enhance or constrain economic development.

This working paper will be used as input for work elements 3200 Selection of Development Plan and 3300 Plan Implementation.

## 2600 INFRASTRUCTURE EVALUATION

Purpose: To determine the economic infrastructure deficiencies of the area and of specific sites. As these deficiencies are overcome, the potential for self-sustaining economic activity in the area will increase.

Method: Examine work element 1300 Inventory Infrastructure, and relate the information contained therein to work elements 2200 Industry Studies and 2400 Sites Analysis. Identify constraints to area and site development arising from inadequate or nonexistent infrastructure.

### Work elements:

- 2601 Relate to work elements 1300, 1700, 2200, and 2400
- 2602 For each site, determine required
  - .1 Transportation
  - .2 Communication
  - .3 Power
  - .4 Education and health facilities
- 2603 For each site, list minimum infrastructure requirements

End product: A working paper identifying the required additional public capital investment necessary to fully utilize selected sites. This information will be used as input for work element 3200 Selection of Development Plan.

## 2700 REVIEW AND CRITIQUE OF AVAILABLE MODELS

Purpose: To analyze available economic development models to determine their applicability in formulating the comprehensive development plan.

Method: Analysis will be made of the available economic development models. Where possible, an evaluation by the organization using the model will be obtained. The models will be analyzed for the computer language and adaptability to available computers for performing necessary tasks. Data needs will also be checked. A critique of each major model will be prepared.

### Work elements:

- 2701 Relate to work element 1400
- 2702 Review concepts of models
- 2703 Review language of models
- 2704 Evaluate models

End product: A report discussing the applicability of the various models to the comprehensive development plan for possible use as input to work element 3200 Selection of Development Plan.

### PHASE 3

#### SELECTION OF THE DEVELOPMENT PLAN

In Phase 3, the information which has been gathered, analyzed, and evaluated through Phase 1 and Phase 2 study efforts, will be used to formulate a comprehensive development plan for the Waterway area. Alternative development policies such as increasing income, tax base, employment, and the maintenance and enhancement of environmental quality will be formulated and the nature and extent of their policy conflicts will be identified. Methodologies to measure the economic benefits of the alternative policies will be developed. With these methodologies alternative program and project mixes will be formulated and their economic benefits will be determined. Projects and programs to be included in the development plan will be selected. In addition, during this phase alternative means of directing the implementation of the development plan will be examined, and an organizational structure and institutional arrangement for directing the implementation will be identified.

## 3000 FORMULATE DEVELOPMENT POLICY ALTERNATIVES

Purpose: To select alternative development policies for use in formulating and implementing the development plan. The relevance of policies identified and analyzed in Phases 1 and 2 will be examined and appropriate policies will be selected.

Method: Review output of work element 2000 Policy Evaluation and identify nature and extent of policy conflicts.

### Work elements:

- 3001 Relate to work element 2000
- 3002 Review ORC statements
- 3003 Select policy alternatives
  - .1 Increase income
  - .2 Increase tax base
  - .3 Increase employment
  - .4 Maintain and enhance environmental quality
  - .5 Other
- 3004 Identify nature and extent of policy conflicts

End product: A working paper describing policy alternatives for the implementation of the development plan. It will be used as input for work elements 3100 Measure Policy Contribution to Development; 3200 Selection of Development Plan; 3300 Plan Implementation; and 4000 Continuing Program of Evaluation and Implementation.

## 3100 MEASURE POLICY CONTRIBUTION TO DEVELOPMENT

Purpose: Devise methodology to estimate the effects of alternative development policies.

Method: Determine the relationships between selected economic activities and policy alternatives developed in work element 3000 Formulate Development Policy Alternatives. These relationships are to be used in measuring the contribution of various policies to the ORC goals and to establish implementation priorities for the components of the plan to be selected in work element 3200 Selection of Development Plan.

### Work elements:

3101 Relate to Phase 2 and work element 3000

3102 Increase income policy alternative

- .1 Determine the relationship between wage and per capita income increases in different occupational categories
- .2 Rank various types of employment by magnitude of income increases

3103 Increase tax base policy alternative

- .1 Determine the relationship between types of increased economic activity and the existing and possible future tax structure
  - .11 Primary yields
  - .12 Ultimate yields
- .2 Rank various types of investment by magnitude of tax payments

- .21 Local taxes
- .22 State taxes
- .23 Federal taxes

3104 Increase employment policy alternative

- .1 Determine labor force needs for various types of economic activities
  - .11 Labor intensive industry
  - .12 Capital intensive industry
  - .13 Trade and services
  - .14 Government
  - .15 Other
- .2 Determine the labor supply area for various types of activities
- .3 Rank economic activities by the magnitude of the employment needs and skill levels
  - .31 Unskilled
  - .32 Semiskilled
  - .33 Skilled

3105 Maintain and enhance environmental quality policy alternative

- .1 Develop "desired quality" environmental indexes for ranking economic activities
- .2 Determine means of achieving desired levels of environmental quality
- .3 Rank economic activities by their effects on environmental quality

3106 Other policy alternatives

- .1 Develop necessary information to identify relationships between economic development and selected other policies.
- .2 Rank other policy alternatives by their effects on achieving a desired level of economic development.

End product: A working paper containing the methodology for measuring effects of alternative policies for use as input for work elements 3200 Selection of Development Plan and 4000 Continuing Program of Evaluation and Implementation.

## 3200 SELECTION OF DEVELOPMENT PLAN

Purpose: Formulate projects and programs that comprise the development plan.

Method: Using data developed in Phase 2, policies developed in work element 3000 Formulate Development Policy Alternatives, and methodology developed in work element 3100 Measure Policy Contribution to Development, select the projects and programs that comprise the development plan.

### Work elements:

- 3201 Relate to Phase 2 and work elements 3000 and 3100
- 3202 Formulate alternative projects and programs
  - .1 Select components
  - .2 Establish priority
  - .3 Establish schedule
- 3203 Test each alternative for its contribution to ORC goal
  - .1 Income
  - .2 Tax base
  - .3 Employment
  - .4 Environmental quality
  - .5 Other
- 3204 Select the projects and programs to be included as the development plan
- 3205 Identify the development plan areas of influence
  - .1 Industrial activities
  - .2 Commercial enterprises

- .3 Residential areas
- .4 Leisure opportunities
- .5 Interactions among these areas

End product: The comprehensive economic development plan for the Arkansas-Verdigris Waterway area including the identification of the areas of influence of its component parts.

### 3300 PLAN IMPLEMENTATION

Purpose: Determine the most effective organization structure and institutional arrangements for implementing the plan.

Method: Examine organizational structures and institutional arrangements with a view to developing an "organization" which will be responsible for providing direction, impetus and stimulus to continuing plan implementation and monitoring and updating the plan as appropriate.

Work elements:

3301 Relate to work elements 2000, 2500 and 3200

3302 Explore the following potential problem areas to determine their applicability to the Waterway area

- .1 Regional (inter and intrastate) problems in land use regulation
- .2 Local financial problems
- .3 Technical and procedural problems
- .4 New techniques in land use regulations

3303 Identify existing land use regulatory and operational controls, including the following

- .1 Existing land use patterns
- .2 Zoning
- .3 Regulatory controls
- .4 Implications of water quality standards
- .5 Implications of air pollution standards
- .6 Advisory authorities

.7 Other activities subject to Federal, State or local permits or standards

3304 Identify and discuss the following alternative organizational structures and institutional arrangements for the implementation and management of the plan.

.1 Intrastate or interstate districts or authorities

.2 Interstate compacts

.3 Federal interstate compacts

.4 Evolving authority

.5 Valley authority

.6 Other

3305 ORC selects organizational structure and institutional arrangements to implement the plan

3306 Determine the additional legislation needed to set up the plan management authority and the procedure for obtaining the necessary additional authorities

End product: A report describing the organizational structure and institutional arrangement for plan implementation.

#### PHASE 4

#### CONTINUING IMPLEMENTATION

Phase 4 provides for continuing implementation of the development plan. Procedures to periodically update the development plan, to report progress on its implementation, and to review its accomplishments will be determined. Over a long period of time considerable economic growth and development can be expected in the Waterway area. Continuing implementation is essential if the plan is to be fully responsive to the needs and potentials of the Waterway area.

## 4000 CONTINUING PROGRAM OF EVALUATION AND IMPLEMENTATION

Purpose: To provide guidance for the organization responsible for the implementation, updating and revision of the development plan. As the implementation of the development plan for the Waterway area continues, the sequence and timing of Waterway development activities should be reviewed.

Method: The organizational structure identified in work element 3300 Plan Implementation, should monitor and update the development plan as appropriate. It is necessary to provide orderly methods to monitor on-going activities, report progress, review accomplishments, and revise goals and schedules to meet changing social and environmental conditions and related demands on the resource base.

### Work elements:

4001 Establish process to:

- .1 Monitor on-going activities
- .2 Document progress
- .3 Review accomplishments
- .4 Revise goals and schedules
- .5 Monitor environmental quality

4002 Relate continuing planning to:

- .1 Policy development
- .2 Potential reorientation of goals
- .3 Data and information coordination
- .4 Land use development

- .5 Changing desires and aspirations of local citizenry
- .6 Capital improvement programming
- .7 Financial capacity
- .8 Research
- .9 Other

End product: Continuing review of evaluation and implementation activity.

**TO** : Corps of Engineers  
Department of the Army

**FROM** : William M. McCandless  
Federal Cochairman  
Ozarks Regional Commission

**SUBJECT** : Memorandum of Agreement Between the Ozarks  
Regional Commission and the Corps of Engineers  
Regarding the Formulation of a Plan of Study to  
Determine Optimum Economic Development Within  
the Arkansas River Valley

Based on discussions which have been held between members of our respective staffs, this will confirm agreement by this Commission to provide the funds to the Corps of Engineers to enable the U.S. Corps of Engineers to undertake the formulation of a plan of study for a program of studies and actions to determine orderly and optimum economic development within the Arkansas River Valley with particular emphasis on those lands adjacent to the Arkansas-Verdigris Waterway. It is contemplated that the results of this project will have significant value and usefulness as applied to the Ozarks Region.

The following guidelines are agreed upon by the Corps of Engineers and the Ozarks Regional Commission as governing this project:

1. It is agreed that the U. S. Corps of Engineers will undertake for a cost of not to exceed \$50,000 the formulation of a plan of study for a program of studies and actions to determine orderly and optimum economic development within the Arkansas River Valley with particular emphasis on those lands adjacent to the Arkansas-Verdigris Waterway. Such design should include recognition of the importance of studies and programs involving multiple land uses, planning standards, industrial potential and feasibility of selected industries, regulatory control, transportation, power sources, scheduling of public and private investments, and recreational development.

2. It is understood and agreed that the project is not for the accomplishment of recommended studies and action programs, but of a plan of study and scheduling of such studies and programs and fitting them together into a recommended long-range action plan for public and private agencies and organizations.

**APPENDIX A**

3. It is agreed that the schedule and details of work to be accomplished by the project, agreed to here in principle, will be determined by a task force jointly named by the Ozarks Regional Commission and the U. S. Corps of Engineers.

4. It is agreed that the project will be completed within one year of execution of this Memorandum of Understanding.

5. In the accomplishment of the work, the U. S. Corps of Engineers may employ consultants and contractors with the prior agreement of the Ozarks Regional Commission. The Ozarks Regional Commission will be furnished progress reports, preliminary draft reports, and final reports prepared in the course of the project, in accordance with the schedule of work determined by the task force.

6. Any press releases, public announcements, or other publications resulting from this study, will indicate that the project has been supported by the Ozarks Regional Commission in conjunction with the Corps of Engineers.

If these arrangements are satisfactory, please sign all copies of this Memorandum returning the original and one copy to this office. Following receipt of signed copies of this Memorandum of Agreement, the Ozarks Regional Commission will transfer \$50,000 to the Corps of Engineers.

Signed William M. McCandless  
William M. McCandless  
Federal Cochairman  
Ozarks Regional Commission

Signed R. H. Groves  
R. H. GROVES, Colonel  
Corps of Engineers  
Deputy Director, Civil Work

Date 3/10/69

Date 12 Mar 69

WORK SUMMARY SEQUENCE DIAGRAM



